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Abstracts

*Abstracts are listed by presentation type:
first posters, then symposia followed by paper presentations. Citation posters
are presented first and represent the highest rated posters.*

CITATION POSTERS

1) Abstract 1056

PHYSIOLOGICAL RESPONSES TO ACUTE PSYCHOLOGICAL STRESS: THE ROLE OF BEHAVIORAL DISENGAGEMENT

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Blunted cardiovascular reactions to acute psychological stress are associated with increased negative behavioral and health outcomes, such as lower levels of perseverance, early relapse in smoking cessation programs, and depression. Similarly, dysfunctional coping behaviors like behavioral disengagement, in which a person “gives up” trying to fix a problem or cope with a difficult situation, has been associated with negative mental health outcomes (e.g., addiction, depression). Few studies, however, have examined the link between behavioral disengagement and blunted cardiovascular responses to stress. The present study extends the literature by examining the relationship between behavioral disengagement and biological disengagement in response to acute psychological stress. Participants were 116 undergraduate students (66.7% female, 62.6% white) who completed the Brief Coping Orientation to Problems Experienced (Brief COPE) scale and a standardized mental arithmetic stress task in the laboratory (PASAT). Heart rate and blood pressure measurements were taken every two minutes during a 10-minute baseline period and every one minute during the 4-minute PASAT. Cardiovascular stress reactivity was calculated as the difference between the stress and baseline cardiovascular values. Preliminary regression analyses using cardiovascular reactivity to predict behavioral disengagement were significant for heart rate ($\beta = -0.20, p = .029$), diastolic blood pressure ($\beta = -0.27, p = .004$), and systolic blood pressure ($\beta = -0.20, p = .034$). Subsequent regression analyses adjusting for potential confounding variables, such as race, gender, socioeconomic status, and self-reported depression, remained significant for all variables (p 's < .018). In conclusion, disengagement is negatively associated with cardiovascular reactivity, such that decreased or blunted cardiovascular responses correspond to higher levels of behavioral disengagement. The findings provide support for the role of behavioral disengagement in blunted cardiovascular reactivity. It is possible that blunted reactivity is a marker of behavioral disengagement which in turn predicts adverse health and behavioral outcomes. Future research should examine the possible mediating role of behavioral disengagement in the relationship between blunted reactivity and negative health outcomes.

2) Abstract 1222

THE BUFFERING EFFECT OF SOCIAL SUPPORT IN THE RELATIONSHIP BETWEEN STRESS, IMMUNE FUNCTION AND INFECTIONS IN WOMEN RECEIVING CHEMOTHERAPY FOR BREAST CANCER

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Stress is associated with immune alterations and an increased risk for infections. Cancer patients are at an increased risk of immunosuppression and infections during chemotherapy, but the role of stress in infectious risk has never been assessed in this population. The stress-buffering hypothesis postulates that social support has a protective effect on health, by reducing the level of stress experienced by individuals, but the role of social support in the stress-infections relationship has yet to be investigated. The goals of this naturalistic study were: 1) to evaluate the associations between stress and infections and the mediating role of immunity; and 2) to investigate the buffering effect of social support in the relationship between stress,

immune function, and infections during and after chemotherapy in women with breast cancer. Fifty women about to receive chemotherapy for breast cancer completed the Inventory of Recent Life Experiences for Cancer Patients (IRLE-C) and the Friends subscale of the Perceived Social Support from Friends and Family (PSS), provided blood samples for immune measures (i.e., T cells, NK cells and neutrophils) and completed the Structured Interview for the Assessment of Infectious Illness Symptoms (SIAIS) at pre-treatment (T1), post-treatment (T2) and 3-month follow-up (T3). Marital status was also used as a social support measure. A higher stress level at baseline significantly predicted a greater occurrence of infections during chemotherapy (T2) but not at T3. None of the immune markers significantly explained this relationship. Social support (marital status alone or combined with perceived support from friends) had a strong protective effect on the relationship between stress and infections at T2. Single patients with a lower perceived support from friends showed the strongest (significant) association between stress and infections at T2, while the weakest association was found in partnered patients with a higher support from friends. These findings suggest that women reporting more daily hassles related to cancer before initiating chemotherapy are at a higher risk of developing infections during chemotherapy and that social support, in particular having a life partner but also the perceived support from friends, protects women from experiencing this deleterious effect of stress.

3) Abstract 1592

CLOSE RELATIONSHIPS AND THE EXPERIENCE OF NEGATIVE EMOTIONS ACROSS DIFFERENT CONVERSATION TOPICS: THE IMPORTANCE OF ASSESSING SELF-AND-PERCEIVED PARTNER'S EMOTION REGULATION

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Negative emotions tend to breed stress and poor health. Emotion regulation refers to the use of various strategies, such as reappraisal, alertness, and expressive composure, to help manage negative experiences, emotions, and thoughts. Although such emotion regulation often occurs within broader social interactions, little is known about how different conversation contexts interact with specific regulation strategies to shape the experience of negative emotions in couples. Using data from 40 heterosexual romantic couples, multilevel modeling was used to account for the interdependence found in couple data (Kenny, Kashy, & Cook, 2006). A Bayesian estimation approach was implemented given growing concerns about the Frequentist framework, including misinterpretation of p-values and being limited to the binary decision of whether to reject the null or not (Baldwin, & Larson, 2016). Our results provide initial evidence that habitual use of self-reappraisal ($b = -0.07, SE = 0.03, [95\% CI = -0.14, -0.01]$) and perception of partner reappraisal ($b = -0.06, SE = 0.03, [95\% CI = -0.12, -0.01]$) was associated with lower experience of negative emotions when sharing a recent negative event. Moreover, self-alertness ($b = 0.01, SE = 0.03, [95\% CI = 0.02, 0.16]$) was associated with higher experience of negative emotions when discussing a relationship conflict. However, perception of partner alertness was associated with lower experience of negative emotions ($b = -0.06, SE = 0.03, [95\% CI = -0.13, -0.01]$) when discussing a relationship conflict. Lastly, perception of partner composure was associated with lower experience of negative emotions when discussing a recent positive event ($b = -0.10, SE = 0.03, [95\% CI = -0.16, -0.04]$). These patterns are consistent with the importance of interpersonal influences on emotion regulation and suggest that assessment of partner support can help elucidate the mechanisms of successfully regulating negative emotions experience in different emotional contexts. These intertwined emotional mechanisms thus, lead to changes to health that are significantly important to the general public but also for developing effective and targeted interventions that focus on social systems.

4) Abstract 1662

ELEVATED SALIVARY CORTISOL ACROSS EARLY CHILDHOOD PREDICTS GLUCOCORTICOID RESISTANCE IN EARLY ADOLESCENCE

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A growing body of research demonstrates that early-life stress exposure is linked to later-life health outcomes, with disparities in outcomes emerging as early as childhood. However, the mechanisms by which early stress might contribute to adverse health effects remain poorly understood. One likely mechanism is via altered glucocorticoid activity. Glucocorticoids (e.g., cortisol in humans) are essential for myriad physiological functions, including the maintenance of cardiovascular tone, provision of anti-inflammatory effects, and regulation of growth, behavior, and cognition. Here we assessed if glucocorticoid levels across infancy and toddlerhood were associated with impaired tissue sensitivity to glucocorticoids (glucocorticoid resistance) in early adolescence. Data come from the Family Life Project, a longitudinal study of 1,292 children and their caregivers living in predominantly low-income non-urban communities. Children's resting levels of cortisol were assayed via saliva samples collected in their home at 6, 15, 24, and 48 months of age. Glucocorticoid resistance at 11-12 years of age was assessed using a well-established protocol whereby whole blood was diluted in phosphate buffered saline and cultured with and without endotoxin lipopolysaccharide (LPS) at a range of concentrations of hydrocortisone. Glucocorticoid resistance was quantified by the difference in inflammatory cytokine (IL-6) levels in response to LPS alone versus LPS with the highest concentration of hydrocortisone. Structural equation modeling was used to assess direct effects of a latent variable of early childhood cortisol on glucocorticoid resistance in early adolescence. All models adjusted for demographic covariates, including infant's race, gender, age, and mother's age, as well as child's body mass index, health status, time of blood draw, and body temperature. Analyses revealed a significant positive association between cortisol levels and glucocorticoid resistance, such that higher cortisol in early childhood predicted increased glucocorticoid resistance in early adolescence ($b=0.893$, $p=0.023$). Our findings support the idea that prolonged elevation of glucocorticoids in early life may result in a dysregulated response such that the expression and/or function of glucocorticoid receptors become downregulated, leading to glucocorticoid resistance.

5) Abstract 1148

RACE/ETHNIC GROUP DIFFERENCES IN PSYCHOSOCIAL CHRONIC PAIN TREATMENT

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Racial/ethnic group disparities in chronic pain (CP) experience are well-documented in experimental and clinical literatures. Psychosocial treatment (often cognitive-behavioral therapy/CBT or acceptance and commitment therapy/ACT) is increasingly prescribed as part of comprehensive CP management. CBT and ACT aim to reduce pain-related anxiety and depression, and improve functional outcomes and disability, all of which have been shown to vary among racial/ethnic groups, such that non-white patients often show worse outcomes. Psychosocial treatment holds promise for reducing disparities in CP experience, yet intervention studies have largely failed to examine race/ethnicity as a moderator of treatment outcomes. In the current study, 114 participants (68% white, 32% non-white) with various CP conditions completed an 8-week psychotherapy treatment (either CBT

or ACT) for CP. Primary outcomes (pain severity and pain interference), secondary outcomes (pain anxiety and depression), and process variables (pain acceptance and pain control), were assessed at four time points (baseline, pre-treatment, post-treatment, and 6-month follow-up). This secondary analysis examined: (1) whether mean scores on outcome and process variables differed between white and non-white participants at baseline (via t-tests), and (2) whether race/ethnic group moderated change in these variables (via mixed effects models). Due to small cells, non-white participants were combined into a single group. The sample was 51% female, middle aged ($M=55$ years), with 47% reporting disability. Average duration of CP was 15 years. Common conditions were osteoarthritis (33.3%), neuropathic pain (30.7%), and degenerative disc disease (28.9%). At baseline, non-white participants reported significantly greater pain anxiety, lower pain control, and lower pain acceptance, $ps<.01$. From baseline to follow-up, non-white participants showed significantly greater increases in pain acceptance ($p=.01$), and marginally greater decreases in pain anxiety and pain intensity ($ps=.08$). At follow-up, no group differences were detected. These findings are consistent with literature documenting racial/ethnic group differences in CP treatment targets, and suggest that psychosocial treatment sufficiently reduced differences. Further research should examine possible differences among non-white racial/ethnic groups.

6) Abstract 1175

PSYCHOSOCIAL INTERVENTIONS AND IMMUNE SYSTEM FUNCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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More than 50% of deaths worldwide are currently attributable to inflammation-related diseases. Psychosocial interventions may represent a potentially useful strategy for addressing this public health crisis, but it remains unknown which types of interventions reliably improve immune system function, under what conditions, and for whom. To address this issue, we conducted the first meta-analysis of relevant randomized controlled trials (RCTs) in which we estimated the effects that psychosocial interventions have on immune system function and identified factors moderating these effects. We examined eight psychosocial interventions [behavior therapy, cognitive therapy (CBT), CBT, CBT + additive, bereavement/supportive therapy, multiple/combined interventions, other psychotherapy, psychoeducation], seven immune outcomes (pro-inflammatory cytokines/markers, anti-inflammatory cytokines/markers, antibodies, immune cell counts, natural killer cell activity, viral load, other immune outcomes), and nine moderating factors (intervention type, intervention format, intervention length, immune marker type, basal vs. stimulated markers, immune marker measurement timing, disease state/reason for treatment, age, sex). RCTs had to include a psychosocial intervention, immune outcome, and pre- and post-intervention immunologic assessments. Of 4,621 identified studies, 62 were eligible and 56 were included. Data were extracted by an investigator who was blind to study hypotheses and analyses and were analyzed using robust variance estimation. The primary a priori outcomes were pretest-posttest-control group effect sizes for the seven immunologic outcomes examined. Across 56 RCTs and 4,060 participants, psychosocial interventions exerted a positive effect on immunity. Overall, participants randomly assigned to a psychosocial intervention exhibited a 19.4% improvement in beneficial immune system function and a 2.9% decrease in harmful function. These effects persisted for at least six months post-treatment and were robust across age, sex, and intervention duration. Effects were strongest for CBT and group-based interventions, and for studies that assessed pro-inflammatory cytokines/markers. These results suggest that psychosocial interventions enhance immune system function and may represent a viable strategy for improving immune-related health.

7) Abstract 1638

ASSOCIATIONS OF CHANGES IN DEPRESSIVE SYMPTOM CLUSTERS WITH CHANGES IN CARDIOVASCULAR DISEASE RISK FOLLOWING DEPRESSION TREATMENT: DATA FROM THE eIMPACT RANDOMIZED CONTROLLED TRIAL

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A secondary analysis of the ENRICHD Trial (J Affect Disord. 2013;149:335-41) found that improvements in somatic, but not cognitive, symptoms of depression following depression treatment were associated with better cardiovascular prognosis in post-myocardial infarction patients. We sought to examine a similar question but earlier in the natural history of cardiovascular disease (CVD): are changes in somatic or cognitive/affective symptoms following depression treatment associated with changes in CVD risk in adults at elevated CVD risk?

We examined data from the eIMPACT Trial, a phase II RCT comparing 12 months of our eIMPACT intervention to usual primary care for depression (see Table 1 footnotes a and b for descriptions of the intervention and comparator). Participants were 216 primary care patients aged ≥ 50 years with a depressive disorder and CVD risk factors but no clinical CVD from a safety net healthcare system ($M_{age}=59$ years, 78% female, 50% Black, $M_{education}=13$ years).

The primary outcome of the trial was endothelial dysfunction assessed by brachial flow-mediated dilation (FMD), a barometer of CVD risk and predictor of future CVD events. For this analysis, depressive symptoms were measured by the Patient Health Questionnaire-9 (PHQ-9). We selected participants with complete data on all variables ($n=193$). Arithmetic change scores for PHQ-9 variables (lower score=better outcome) and FMD (higher score=better outcome) were computed as post-treatment minus pre-treatment. In the full sample, the mean 12-month change in PHQ-9 total, somatic, and cognitive/affective symptoms was -4.7, -1.9, and -2.8, respectively. These improvements were larger in the intervention arm versus the usual care arm (all $ps<0.01$). As shown in Table 1, we observed no associations between 12-month changes in total, somatic, or cognitive/affective symptoms and 12-month changes in FMD (all $ps>0.45$). Analyses stratified by trial arm yielded similar results. In contrast to the ENRICHD secondary analysis examining CVD prognosis, we did not observe associations between changes in somatic depressive symptoms following depression treatment and changes in a CVD risk marker.

While our results raise the possibility that improving depressive symptoms alone is not sufficient to lower CVD risk, future studies examining other CVD risk markers and incident CVD events are needed.

Table 1. Associations of 12-Month Changes in Total, Somatic, and Cognitive/ Affective Depressive Symptoms with 12-Month Changes in Brachial Flow-Mediated Dilation (FMD) in the eIMPACT Trial

	Full Sample		Intervention Arm ^a		Usual Care Arm ^b	
	($n=193$)		($n=97$)		($n=96$)	
	β	p-value	β	p-value	β	p-value
12-Month Changes in PHQ-9 Total Score	-0.051	0.516	-0.030	0.784	-0.036	0.753
12-Month Changes in PHQ-9 Somatic Score ^c	-0.054	0.485	0.007	0.946	-0.073	0.501
12-Month Changes in PHQ-9 Cognitive/Affective Score ^c	-0.039	0.622	-0.052	0.640	-0.003	0.980

Note. Each predictor variable was examined in a separate linear regression model. Change in FMD ranged from -10.4 to 7.3, and there was no significant difference between the arms ($p=0.719$). Covariates for the full sample models were randomization status, age, sex, race, education, body mass index, smoking status, hypertension diagnosis, hyperlipidemia diagnosis, diabetes diagnosis, CVD prevention medication use, and diabetes medication use. With the exception of randomization status, the covariates in the intervention and usual care models were identical. PHQ-9 = Patient Health Questionnaire-9.

^aeIMPACT is our modernized collaborative care intervention for depression, which involves a multidisciplinary team delivering internet cognitive-behavioral therapy (CBT), telephonic CBT, and/or select antidepressants in an algorithm optimized for CVD risk reduction, consistent with patient preference.

^bUsual primary care involves a team care approach, with primary care providers supported by embedded behavioral health clinicians and affiliated psychiatrists available for brief counseling and antidepressant management.

^cThe somatic subscale (sum of PHQ-9 items 3, 4, and 5) and the cognitive/affective subscale (sum of PHQ-9 items 1, 2, 6, 7, 8, and 9) were computed based on our prior confirmatory factor analysis (Depress Anxiety. 2019;36(9):813-823).

8) Abstract 1768

FOOD INSECURITY IN ADOLESCENCE: A MOUSE MODEL TO INFORM PUBLIC HEALTH

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Background: Food insecurity has been associated with physical and mental health outcomes and involves a combination of uncertainty, stress, and nutrition within complex social, economic, and environmental contexts. To date, no animal model of food insecurity has been developed. Studying food insecurity in a controlled laboratory environment can inform research in human populations.

Methods: Female CD-1 mice were assigned to food insecurity ($n=40$) or the control condition ($n=40$). During food insecurity (PND 28-60), exposed mice received varied, unpredictable amounts of food for four days, followed by *ad libitum* access for three days. Food consumption was measured daily at the cage level. Social hierarchy in each cage was evaluated using competition for water. Preference for regular chow vs. high fat food was assessed for each individual. Coping behaviors were measured using the forced swim test. Body composition was assessed using QMR (EchoMRI) throughout the study. Statistical analysis included repeated measures ANOVA and stratified linear regression.

Results: Mice were exposed to food insecurity throughout adolescence; groups did not differ in nutrition, only in predictability of food access. Mice exposed to food insecurity ate less than controls during periods of insecurity and more during recovery periods (two-way ANOVA: group x time interaction: $F_{15,194}=13.55$, $p<0.01$). Food insecurity led to temporary differences in body composition. Body fat % increased following food insecurity (two-way ANOVA contrast $F_{1,538}=6.30$, $p=0.01$), but returned to control levels over time. Social hierarchy predicted coping behaviors among mice exposed to food insecurity (linear regression, $T=2.91$, $p=0.02$), such that subordinate mice displayed more maladaptive coping strategies, but no association was observed among controls. Social rank was associated with increased high fat food consumption in controls (linear regression, $T=-2.24$, $p=0.06$), but no association was observed in the food insecurity group.

Conclusions: In a mouse model, exposure to food insecurity during adolescence affected food consumption and body fat percentage in the short term. Food insecurity modified the salience of social hierarchy

with respect to coping behavior and food preference. Laboratory animal models of food insecurity may be further developed and used to inform public health questions.

9) Abstract 1264

ADVERSE LIFE EVENTS ARE ASSOCIATED WITH IMPAIRED DESCENDING INHIBITION OF SPINAL NOCICEPTION

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Adverse Life Experiences (ALEs) are a significant risk factor for the development of chronic pain. However, the mechanisms underlying this association are not clearly understood. The present study was conducted to examine whether or not ALEs impact descending (cerebrospinal) inhibition of spinal nociception (neural signals that encode pain). To assess this, the magnitude of the nociceptive flexion reflex (NFR), a well-validated and widely used measure of spinal nociception, was measured in 248 healthy, pain-free participants during a conditioned pain modulation (CPM) task. CPM assesses the degree to which one painful stimulus (a test stimulus) is inhibited by the presence of another painful stimulus (a conditioned stimulus). In this CPM paradigm, the test stimulus (a painful electric stimulation over the sural nerve at the ankle) was delivered before and during the presentation of the tonic conditioning stimulus (submerging the left hand in painfully cold 10°C water). Previous research suggests that NFR is typically inhibited during CPM and that less NFR inhibition during CPM is associated with chronic pain risk. Multilevel (mixed-effect) modeling results found that a greater frequency of ALEs was associated with the degree of NFR inhibition during CPM even after controlling for body mass index, sex, mean arterial pressure, sleep quality, stimulation intensity, and psychological distress. Experiencing 0 or 1 ALE was associated with significant NFR inhibition during CPM ($p < .01$), experiencing 2-4 ALEs was associated with no NFR modulation ($p > .05$), and experiencing ≥ 5 ALEs was associated with significant NFR facilitation ($p = .02$). Taken together, these findings suggest that ALEs may disrupt descending inhibition of NFR, even tipping the modulatory balance towards facilitation, perhaps placing survivors of ALEs at an increased risk for the future development of chronic pain.

10) Abstract 1275

GENETIC AND STRESS INFLUENCES ON THE PREVALENCE OF HYPERTENSION AMONG HISPANICS/LATINOS IN THE HISPANIC COMMUNITY HEALTH STUDY/STUDY OF LATINOS (HCHS/SOL)

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Hypertension is one of the most robust, modifiable risk factors associated with cardiovascular disease in the US. Genetic, psychosocial, and environmental contributions to hypertension have been identified, but limited research has focused on interactions among these factors in hypertension prevalence. Stress is one of the more robust psychosocial predictors of hypertension. We examined the interaction between chronic stress and a genetic risk score (GRS) on the presence of hypertension and elevated SBP and DBP in Hispanics/Latinos in the Hispanic Community Health Study/Study of

Latinos. Participants ($N=11,623$) were assessed during two clinic visits (Visit 1 2008-2013 & Visit 2 2014-2018) using biospecimens and questionnaires. Of those, we analyzed 7,550 adults (50.4% female), aged 18-74 ($M=53.32$, $SD=13.16$), who were genotyped and responded to chronic stress questionnaires. Hypertension at Visit 2 was defined as a sitting $BP \geq 140/90$ mmHg. An unweighted GRS was calculated using BP increasing SNPs found to be generalizable to Hispanics/Latinos (14 SNPs). Linear and logistic regression models accounted for sampling weights, stratification, and cluster design features. To handle participants on anti-hypertensive medication, missing data methods were used with a Visit 1 auxiliary variable model to estimate BP parameters. After adjusting for biologic and sociodemographic covariates, there were main effects for chronic stress ($OR=1.18$, 95% $CI: 1.15, 1.22$) and GRS ($OR=1.04$, 95% $CI: 1.01, 1.07$) on the presence of hypertension, yet no significant interaction ($OR=1.00$, 95% $CI: .98, 1.02$). GRS ($b=.32$, 95% $CI: .08, .55$, $R^2=.02$) and chronic stress ($b=.45$, 95% $CI: .19, .72$, $R^2=.11$) were related to DBP, with no significant interaction ($b=.04$, 95% $CI: -.11, .19$). GRS ($b=.42$, 95% $CI: .08, .76$, $R^2=.01$) and chronic stress ($b=.80$, 95% $CI: .34, 1.26$, $R^2=.11$) were also related to SBP, with no significant interaction ($b=.08$, 95% $CI: -.16, .31$). Results are consistent with literature suggesting chronic stress is a strong, direct psychosocial contributor to elevated BP. Other environmental contributors to BP (dietary Na, sedentary lifestyle, BMI, and age) may interact with genetic risk. Overall, these types of investigations may inform the development of targeted, population-specific hypertension prevention and intervention strategies.

11) Abstract 1356

THE INFLUENCE OF LIGHT THERAPY ON DIURNAL CORTISOL RHYTHMS IN A SAMPLE OF FATIGUED CANCER SURVIVORS

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Background: Altered diurnal cortisol rhythms may be a mechanism through which symptoms of cancer-related fatigue are maintained in post-treatment cancer survivors. Systematic exposure to early morning bright light may target this underlying dysregulation, leading to improved diurnal cortisol patterns and subsequent reductions in fatigue severity. This is a secondary analysis of a randomized controlled trial that found significant improvements in symptoms of fatigue among cancer survivors with clinical fatigue after a 4-week light therapy intervention. This analysis will examine the impact of the intervention on diurnal cortisol and test whether change in diurnal cortisol slope or total cortisol output may mediate the association between light therapy and fatigue.

Method: Post-treatment adult cancer survivors who met diagnostic criteria for cancer-related fatigue were randomly assigned to receive a light therapy device that emitted either bright white light (BWL; intervention) or dim red light (DRL; active control). Participants used their assigned light therapy device daily for 30 minutes for four consecutive weeks. Assessments of fatigue using the Multidimensional Fatigue Inventory (MFSI-SF) were collected at baseline and at the end of each week of the intervention. Salivary cortisol was collected for 3 days at both baseline and post-intervention and was sampled four times per day (waking, noon, 5pm, bedtime).

Diurnal cortisol slopes and total cortisol output (AUCg) were calculated at baseline and post-intervention.

Results: Seventy-seven participants were included in this analysis (BWL $n = 40$; DRL $n = 37$). After the 4-week intervention, LMM analyses revealed an increase in the steepness of diurnal slopes over time ($p = .01$) and an increase in total cortisol output over time ($p = .03$) in both groups. Neither diurnal cortisol slopes nor total cortisol output mediated the relationship between the light therapy intervention and fatigue levels.

Discussion: The light therapy intervention was associated with some measured change in the diurnal release of cortisol, though this was observed in both intervention conditions. The relationship between light therapy and fatigue does not appear to be mediated by diurnal cortisol rhythms in this sample.

12) Abstract 1576

POSTPARTUM DEPRESSION PREDICTS DIMINISHED POSITIVE AFFECT IN INFANCY

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Background: Exposure to postpartum depression has negative effects on children's development, including risk for internalizing disorders. Previous work indicates that during mother-child interactions maternal depressive symptoms are associated with dampened positive affect in children. However, it is not independent of the altered dyadic interactions that characterize postpartum depression. It is unclear whether infants exposed to postpartum depression exhibit a reduced capacity to experience and express positive affect, or whether these profiles reflect the dyadic context. The purpose of this study was to examine the relation between postpartum depression and infant positive affect independent from a mother-child interaction.

Methods: Data were analyzed from 140 mother-child pairs at 6 months postpartum who were part of a larger longitudinal study. Postpartum depressive symptoms were assessed using the Center for Epidemiological Studies Depression Scale. Child positive affect was assessed with the Laboratory Temperament Assessment Battery puppet show, a standardized paradigm where two puppets attempt to engage the infant. Infant behavior was coded for presence or absence of positive affect in four domains: smiling, laughter, positive vocalizations, and positive motor acts. A composite variable of the number of domains demonstrating a positive response was created, ranging from 0-5.

Results: Analyses revealed that higher levels of maternal depressive symptoms were associated with less infant positive affect during the puppet show. This association was observed whether the CESD data were analyzed continuously ($F = 5.1$; $p < .01$) or using the recommended clinical cutoff for probable depression ($X^2 = 17.81$; $p < .01$). Further, these relations held after adjusting for maternal lifetime history of major depressive disorder and consideration of covariates including cohabitation with the baby's father, race/ethnicity, child sex, and socioeconomic status.

Conclusions: These data suggest that maternal depressive symptomatology predicts dampened infant positive affect, which may in part explain reduced well-being and risk for internalizing disorders later in life among children exposed to postpartum depression. Also, these data contribute to the impoverished literature examining development of positive affect, reward processing, and anhedonia prior to adolescence.

13) Abstract 1603

PRENATAL MATERNAL PSYCHOLOGICAL DISTRESS PREDICTS CHILD EXTERNALIZING BEHAVIOR

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Background: As early as the prenatal period, maternal psychological distress exerts profound influences on child development, including mental health risk. Previous studies have documented associations between both prenatal and postpartum maternal depressive symptoms and child externalizing behaviors (i.e. fighting). However, the question of whether prenatal or postnatal maternal distress is a more potent predictor of externalizing behaviors remains unexplored. The purpose of the present study is to determine whether timing of exposure to maternal distress in early life is associated with the exhibition of externalizing behavior in childhood.

Methods: 234 pregnant women were recruited as part of a prospective longitudinal study examining early life influences on development. A composite measure of prenatal psychological distress was created by standardizing and averaging pregnant women's scores on the Center for Epidemiological Studies Depression Scale Short Form, the Perceived Stress Scale, the State-Trait Anxiety Inventory, and a 10-item pregnancy anxiety scale (Rini, Dunkel-Schetter, Wadhwa, & Sandman, 1999). Maternal distress was also assessed at 3-months postpartum. Child externalizing was measured through maternal report using the Child Behavior Checklist (CBCL) when the children were 8 years old.

Results: Analyses revealed that greater prenatal and postnatal maternal distress was correlated with higher levels of child externalizing behavior ($r(264) = .29$, $p < .001$; $r(234) = .21$, $p = .001$, respectively). However, when modeled together, prenatal distress remained a statistically significant predictor of externalizing behavior ($\beta = .304$, $p < .001$), while postnatal mood did not. Both elevated prenatal and postnatal psychological distress was also associated with higher scores on the syndrome scales of the CBCL (rule breaking behavior, aggressive behavior, oppositional defiant problems, and conduct problems; all r 's $> .23$, p 's $< .001$).

Conclusions: Our findings are consistent with the perspective that maternal distress during pregnancy shapes lifespan developmental trajectories by increasing the expression of externalizing behavior in children. Furthering understanding of prenatal influences on this mental health domain could inform identification of at-risk children and aid the development of interventions for mothers experiencing psychosocial distress.

14) Abstract 1746

EUDAEMONIC WELLBEING AND C-REACTIVE PROTEIN

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Greater wellbeing is associated with better cardiovascular (CV) health and reduced risk of disease and CV-related mortality. In women, wellbeing is also associated with lower levels of systemic inflammation. Prior research has typically used measures of hedonic wellbeing, which capture the extent to which individuals experience positive affect, to study the link between wellbeing and physical health. By contrast, measures of eudaemonic wellbeing (EWB) assess achievement, autonomy, and satisfaction. EWB may be a better index of overall wellbeing, particularly in the context of aging, because it reflects a broader sense of satisfaction and is less impacted by temporary fluctuations in resources. The present study tests the relationship between EWB and C-reactive protein (CRP) in older women. CRP is a compelling predictor of CV health because it correlates better with atherosclerotic changes than conventional measures such as blood pressure or cholesterol. Following a clinic visit, every three months for two years, community-dwelling older women ($N = 199$) completed an in-home interview during which they provided blood samples and information about their current level of

EWB. Data were analyzed with multilevel models. The results suggest no statistically significant relationships between EWB and CRP intercept or slope at the level of overall wellbeing or the subscales (self-acceptance, positive relationships, autonomy, environmental mastery, purpose in life, and personal growth). These results diverge from prior research indicating that greater EWB is associated with lower CRP. In prior samples, measures of positive affect were included as part of EWB; however, measures of EWB should not include affect, which is an aspect of hedonic wellbeing. Thus, prior results linking EWB to lower CRP may have represented a relationship between CRP and mood state as opposed to CRP and EWB. Additionally, the current study presents longitudinal data from a relatively healthy group of older women. Health status may influence how these constructs vary in relation to each other over time, which is not accurately captured in cross-sectional research or in healthy samples. Future research should examine the relationship between EWB and CRP in populations with poorer health to determine whether the relationship is associated with health status.

15) Abstract 1078

CARDIAC AUTONOMIC BALANCE AND INFLAMMATORY RESPONSE TO STRESS IN CHILDREN

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Inflammatory processes are regulated by the autonomic nervous system (ANS), but prior research in humans has focused on linking inflammation to assessments of a single branch of the ANS (parasympathetic or sympathetic), which limits interpretability. To overcome this limitation, the current study tested the relation between cardiac autonomic balance, derived from concurrent measures of both parasympathetic nervous system (PNS) and sympathetic nervous system (SNS) cardiac physiology, and inflammatory responses to acute stress exposure in children.

Method: Participants included 57 children (51% female; Mean(*SD*) age = 9.88(.57) years). Dual branch ANS physiology was assessed during a 5-minute resting period: PNS via respiratory sinus arrhythmia (RSA) and SNS via pre-ejection period (PEP). Cardiac autonomic balance (CAB) was calculated as the standardized ratio of RSA to PEP. Children provided blood serum samples 30 minutes before and 100 minutes after the Trier Social Stress Test modified for children, an acute social stressor. Blood serum from each time point was assayed for 4 inflammatory cytokines: interleukin 6 (IL-6), interleukin 8 (IL-8), interleukin 10 (IL-10), and tumor necrosis factor alpha (TNF- α). Cytokine change scores were calculated by subtracting time 1 values from time 2 values. Resting CAB levels were regressed onto each cytokine change score controlling for: child age, sex, BMI, and SES.

Results: At the univariate level, CAB was negatively correlated with stress-related increases in all four cytokines: IL-6 ($r = -.29, p = .03$), IL-8 ($r = -.31, p = .02$), IL-10 ($r = -.42, p = .001$), and TNF- α ($r = -.34, p = .009$). After controlling for covariates, resting CAB remained a significant predictor of increase in IL-6 ($\beta = -.31, p = .018$), IL-8 ($\beta = -.31, p = .02$), IL-10 ($\beta = -.42, p = .002$), and TNF- α ($\beta = -.33, p = .01$), such that higher CAB predicted less increase in circulating cytokines following acute stress exposure.

Discussion: These results suggest that children with higher CAB exhibit reduced inflammatory responses to acute stress. This may reflect the interconnection between the ANS and the immune system – i.e., the anti-inflammatory effects of the PNS, and the pro-inflammatory effects of the SNS. Future studies should examine the extent to which low resting CAB may be a useful clinical marker of susceptibility to inflammatory-based conditions.

16) Abstract 1313

RUMINATION LINKS NEGATIVE FAMILY INTERACTIONS TO POOR SLEEP QUALITY AMONG OLDER AFRICAN AMERICAN ADULTS

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Objective. Sleep disturbances increase with age and conflictual interactions among family members can negatively impact sleep quality. However, less understood are the mechanisms by which negative family interactions impact sleep. Drawing from the Preservative Cognition Hypothesis, which states that repeated cognitive representations of a stressor perpetuate physiological responses to that stressor, we proposed that daily rumination (i.e., repetitive and intrusive negative thoughts) might be an intermediary for the association between negative interactions among family members and diminished sleep quality. **Methods.** Data were drawn from the Health among Older Adults Living in Detroit (HOLD) study, an ongoing project on healthy aging among older African American adults ($N = 109, M = 69.6$ yrs., $SD = 8.22$, range 50 - 89). Surveys administered at the beginning of the study were used to capture the frequency of negative family interactions experienced in the past 30 days. Global and daily subjective sleep quality were measured using both the Pittsburgh Sleep Quality Index (PSQI) and daily diaries collected over five days, respectively. Daily diaries were also used to assess rumination about adverse events over the same five-day period. **Results.** In line with the Preservative Cognition Hypothesis, rumination significantly mediated the association between negative family interactions and daily sleep quality ($b = -.20, SE = .11, 95\% CI [-.458, -.025]$), but not global sleep quality ($b = .05, SE = .04, 95\% CI [-.010, .132]$). That is, negative interactions with family members led to poorer daily sleep quality through daily rumination. Results held after controlling for yearly income, education, and chronic health conditions ($b = -.19, SE = .11, 95\% CI [-.436, -.021]$). **Conclusion.** Maintaining positive interactions with close others is essential for healthy aging. The present study suggests that negative interactions can be detrimental to health among older adults by disrupting sleep quality. Further, our findings point to rumination as a potential intermediary for the association between negative interactions with family members and daily sleep quality. The current evidence enriches the growing literature suggesting that preservative cognition can be detrimental to healthy aging by prolonging stress responses and disrupting health behaviors.

17) Abstract 1516

WITNESSING, RECEIVING, OR ENACTING AGGRESSIVE BEHAVIORS IN CHILDHOOD VARYINGLY INFLUENCES PHYSICAL AND MENTAL HEALTH OUTCOMES IN YOUNG ADULT DATING COUPLES

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Growing up in an aggressive household has been linked to negative long-term health outcomes (Repetti et al., 2002). However, current research fails to differentiate between *how* children were exposed to aggression. Moreover, despite there being considerable interdependence between the health of intimate partners (Kiecolt-Glaser & Wilson, 2017), few studies consider how having a partner who grew up in an aggressive home may influence one's own health. Distinguishing between witnessing aggressive behaviors (parent-to-parent aggression; PPA), receiving aggressive behaviors (parent-to-child aggression; PCA), or enacting aggressive behaviors (child-to-

parent aggression; CPA), we hypothesized that each type of aggression exposure would be associated with later personal and partner physical and mental health outcomes.

240 young adults ($M_{\text{age}} = 22.56$) in 120 dating couples ($M_{\text{monthstogether}} = 30.05$) individually reported on their childhood experiences of PPA, PCA, and CPA. 210 of these individuals (87.5% retention, 52.4% female) reported on their physical and mental health symptoms 1 year later.

Actor-partner interdependence modeling was used to test whether individuals' mental and physical health outcomes were predicted by (a) their own experiences (actor effects) and (b) their partner's experiences (partner effects) of each type of aggression, controlling for age, relationship duration, and time elapsed between baseline and follow-up. Higher levels of PPA were associated with greater physical health symptoms for both men and women ($b=.929, p=.014$) and greater mental health symptoms for women only ($b=4.65, p<.001$). Higher levels of PCA were associated with more mental health symptoms for women only ($b=4.88, p<.001$). Higher levels of CPA were associated with both more physical ($b=2.16, p=.007$) and mental ($b=4.35, p=.022$) health symptoms for both men and women.

Results suggest that the health implications of being exposed to aggression may vary depending on gender and how the aggression was experienced. Behaving aggressively toward parents, which is largely overlooked in prior literature, has later negative health outcomes for both men and women, and women's mental health is impacted by each type of aggression exposure. Further analyses—of non-self-report health data being collected (e.g., BMI, blood pressure, heart rate)—are planned to be presented.

18) Abstract 1605

INVESTIGATING THE INTERGENERATIONAL SOCIAL TRANSMISSION OF RISK: CAREGIVER AND INFANT CORTISOL MEDIATE THE EFFECTS OF SOCIOECONOMIC RISK ON PROSOCIAL BEHAVIOR

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Background: Exposure to environments of early-life stress, such as socioeconomic risk and poverty, can shape the development of stress physiology and potentially impact later social behavioral outcomes. However, more research is needed to better understand the pathways by which early-life adversity may influence physiological and social development. As such, the purpose of the present study was to investigate the potential transmission of early-life socioeconomic risk from parent to infant via stress physiology, and its relations to prosocial behavior outcomes in early childhood.

Methods: Data come from the Family Life Project, a large, longitudinal sample ($N=1,292$) of low-income families living in non-urban communities. When infants were 7 months old, caregivers reported socioeconomic and demographic information. At 7, 15, and 24 months of age, saliva samples were collected in the home from mother and infant and later assayed for cortisol to index resting levels of cumulative physiological stress. Data on prosocial behavior were collected via teacher completed questionnaires in Kindergarten. We used structural equation modeling to examine whether the association between early life socioeconomic risk at 7 months of age and prosocial behavior in Kindergarten was serially mediated by mother's and infant's cortisol, respectively.

Results: Analyses revealed that infant cortisol partially mediated the association between socioeconomic risk and prosocial behavior, but only through maternal cortisol ($\beta = 0.03$, 95% CI = 0.01–0.05). Importantly, this indirect effect was present over and above the indirect path from socioeconomic risk through infant cortisol to prosocial behavior independent of maternal cortisol. Further, these effects were observed while controlling for multiple relevant covariates including ethnicity, gender, age, and parenting behavior.

Conclusions: These results suggest that maternal cortisol may be a distinct indirect pathway through which environmental adversity

relates to infant cortisol and early prosocial behavior. These findings also highlight the importance of investigating *both* caregiver and child stress physiology together. Broadly, our findings provide support for the idea that the negative relations between socioeconomic risk and early social behavior may be partially transmitted from mother to child via stress physiology.

19) Abstract 1722

DISCRIMINATION PROMOTES PAIN-RELATED ANXIETY AND DECREASED DESCENDING INHIBITION OF NOCICEPTION IN NATIVE AMERICANS: RESULTS FROM THE OKLAHOMA STUDY OF NATIVE AMERICAN PAIN RISK (OK-SNAP)

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Current epidemiological research suggests that Native Americans (NA) are at a higher risk for developing chronic pain than any other ethnic group in the US. The mechanisms underlying this risk are still unknown, and identification of these processes is important in providing potential targets for intervention. It was recently discovered that increased pain-related anxiety in NAs disrupts their descending inhibitory circuits such that NA participants were less able to engage inhibition of the nociceptive flexion reflex (NFR, a physiological measure of spinal nociception) (Rhudy et al., under review). It is known that NAs tend to experience more distrust in medical settings (Guadagnolo et al., 2009), so it may be that experiences of discrimination contributes to increased anxiety in these settings. The current study examined whether NA participants that report more everyday experiences of discrimination are more likely to experience higher pain-related anxiety and thus show impairment of descending inhibition of NFR. Healthy, pain-free NAs ($n=116$) and non-Hispanic Whites (NHW; $n=127$) participated. A conditioned pain modulation (CPM, i.e., pain inhibits pain) task was used to assess descending inhibition. CPM was assessed from painful electric stimulations delivered before (baseline) and during hand submersion into 10°C water (conditioning). NFRs were assessed in response to electric stimuli. Typically, the painfully cold water inhibits NFR from the electric stimulations. Pain-related anxiety was measured from a visual analogue scale (VAS; 0-100), and discrimination was measured from the Everyday Discrimination Scale. A bootstrapped serial mediation model was used to test the following relationship: NA -> discrimination -> anxiety -> impaired NFR inhibition. Results supported this indirect pathway (indirect effect = .0047; bootstrapped 95% CI: .0004, .0118). These findings suggest that: 1) NAs reported more discrimination, 2) more discrimination was associated with higher pain-related anxiety, and 3) higher pain-related anxiety was associated with reduced inhibition of NFR. This identifies a pathway that may promote chronic pain in NAs.

20) Abstract 1794

IMPROVING MOOD AND CARDIOVASCULAR FUNCTION IN WOMEN'S HEALTH: SUPPORT FOR A NEW, MANUALIZED SOCIAL SUPPORT GROUP INTERVENTION DESIGNED FOR WOMEN EXPERIENCING HIGH LIFE STRESS

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Background

Stress can have a major impact on health and is associated with higher rates of depression and cardiovascular disease (CVD). Depression and CVD occur at significantly higher rates in women compared to men. Additionally, significant gender differences exist in stress exposure and reactivity, such that women experience more somatic and physiological complaints in response to stress compared to men. Women's health research has found that social support boosts resiliency to stress and is associated with lower rates of depression and CVD. Despite clear benefits of social support, we are unaware of any manualized social support interventions tailored for women experiencing high stress.

Methods

112 women experiencing high life stress (≥ 20 on the perceived stress scale) were randomized to an 8-week, manualized social support group (SSG) intervention or a standard 8-week mindfulness-based stress reduction (MBSR) group intervention. Using standard questionnaires, self-reported depression (BDI) and dispositional mindfulness (FFMQ) were obtained at baseline and post-intervention. Measures of cardiovascular function (heart rate (HR) and systolic blood pressure (SBP)), autonomic control (baroreflex sensitivity (BRS) and respiratory sinus arrhythmia (RSA)), and stress hormones (epinephrine and norepinephrine) were obtained in response to the trier social stress test (TSST) at baseline (BL) and post-intervention follow-up (F/U).

Results

Intervention (SSG vs. MBSR) X Time (BL vs. F/U) repeated measures ANOVAs found depression scores significantly declined from BL to F/U ($p < .001$, $\eta^2 = 0.28$). SBP and HR during the TSST significantly decreased from BL to F/U ($p = 0.006$, $\eta^2 = 0.09$). RSA and BRS during the TSST significantly increased from BL to F/U ($p = 0.008$, $\eta^2 = 0.13$). Finally, peak epinephrine during the TSST significantly decreased from BL to F/U ($p = 0.045$, $\eta^2 = 0.06$). One interaction effect was found: women in the MBSR group showed a significant decline in HR during the TSST compared to the SSG.

Conclusions

We provide preliminary evidence to support the efficacy of a manualized social support group intervention for improving mood and cardiovascular stress reactivity in women experiencing high life stress. Further validation for this manualized social support group intervention would have public health significance for women's health and could increase access to care.

21) Abstract 1825

BEHAVIORAL AND BIOLOGICAL PREDICTORS OF SYMPTOM FLARES IN ULCERATIVE COLITIS PATIENTS

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The concept of bidirectional brain-gut-microbiome (BGM) interactions has become widely accepted. Alterations in these interactions have been implicated in inflammatory bowel disease. **Aims:** We hypothesized that stress-related changes in BGM interactions may play a role in the development of flares in patients with ulcerative colitis (UC). We aimed to test this hypothesis in a prospective study in 94 UC patients: 1) To identify autonomic, clinical, and behavioral characteristics of stress-reactive UC patients in clinical remission. 2) To identify baseline characteristics that predict risk of symptomatic flares within 1-2 years. **Methods:** 94 subjects in clinical

remission (Mayo score ≤ 1 and Simple Colitis Clinical Activity Index (SCCAI) score < 5) underwent comprehensive phenotyping at baseline including clinical, behavioral, and physiological assessments. All subjects filled out Hospital Anxiety and Depression (HAD), International Personality Item Pool (IPIP)-Neuroticism, and Perceived Stress Scale (PSS) questionnaires and underwent autonomic testing for heart rate variability (HRV) and galvanic skin conductance (GSR) before, during, and after a 3 minute arithmetic stress test. In 65 subjects, stool and saliva samples were analyzed for fecal calprotectin and morning salivary cortisol, respectively. After baseline, both clinical (SCCAI ≥ 5) and subjective flares ("Do you think you are in a flare?") were assessed biweekly in all subjects. **Results:** Baseline measurements identified two clusters of patients based on the degree of neuroticism (IPIP), perceived stress (PSS), and anxiety and depression (HAD); low in cluster 1, high in cluster 2. Cluster 2 also showed higher sympathetic nervous system activity (indexed by GSR). No differences were observed in baseline fecal calprotectin levels between two clusters. Cluster 2 had a higher number of flares during post baseline follow up: Clinical Flares 35% vs 17% ($P = 0.11$); Subjective Flares 30% vs 9% ($P = 0.03$). **Conclusions:** In UC patients in clinical remission, a stress-responsive subset of patients was identified based on several baseline measures, including perceived stress, neuroticism, anxiety and depression, and sympathetic tone. These baseline characteristics predicted frequency of both clinical and subjective flares in UC.

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22) Abstract 1338

RACIAL AND ETHNIC DIFFERENCES IN MOTIVATORS AND BARRIERS TO BLOOD DONATION

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In the US, less than 6% of the population donates blood on an annual basis. Further, 2016 data indicates that racial and ethnic minorities are severely underrepresented in the donor pool, donating at a rate that is approximately 60% of non-minorities. To help understand this gap, the present study examined racial and ethnic differences in motivations to donate blood. A sample of 2579 first-time donors with the New York Blood Center completed an online survey of blood donation motivations (including attitude, self-efficacy, subjective norm, personal moral norms, anxiety, and anticipated regret) within one week of their donation. This diverse sample included 42% who identified as a racial minority and 22% who identified as an ethnic minority. T-tests were conducted to compare responses between each racial/ethnic minority group and Whites. The results revealed that, on average, Black ($n = 220$) and multiracial donors ($n = 405$) reported a more positive attitude, less anticipated regret, lower anxiety, and lower personal moral norms compared to White donors ($n = 1506$, all $p < 0.05$). Further, Asian donors ($n = 418$) reported less anticipated regret, lower subjective norms, and lower self-efficacy compared to White donors (all $p < 0.05$). Finally, relative to non-Hispanic donors ($n = 2004$), Hispanic donors ($n = 575$) reported less anxiety and lower personal moral norms (all $p < 0.05$). These results highlight that motivations and barriers to blood donation may differ across racial and ethnic groups, and suggest that a better understanding of these distinctions may inform recruitment strategies to increase minority representation in the donor pool. Future studies will examine qualitative interviews from this sample to further investigate the nuances of these important differences.

23) Abstract 1538 will not be published

24) Abstract 1679

SOCIAL CONNECTIONS IN CHILDHOOD ARE ASSOCIATED WITH BLOOD PRESSURE IN MIDLIFE: FINDINGS FROM THE 1958 NATIONAL CHILD DEVELOPMENT STUDY

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Background

Social connections in adulthood reduce cardiovascular disease risk, however, less work has examined whether social connections in childhood are linked with later life health. Using a life course perspective, we examined whether childhood social connections were related to blood pressure and pulse in adulthood. We hypothesized that youth with social connections would show healthier levels of systolic blood pressure (SBP), diastolic blood pressure (DBP), and pulse in midlife compared to youth with fewer social connections.

Methods

Data were from the National Child Development Study, which included people born in England, Wales, or Scotland during one week in 1958. Participants have been repeatedly assessed from birth to adulthood. As 11-year-olds, participants wrote in response to the prompt: "Imagine that you are now 25 years old. Write about the life you are leading, your interests, your home life and your work at the age of 25." Two judges rated 500 essays for the extent to which the author mentioned close relationships with family or other people (1=*not at all* to 7=*very*; ICCs=.84-.89). The ratings for family and other people were first combined, then examined separately. At age 45, SBP, DBP, and pulse were clinically-assessed. Linear regression models ($N=483$) controlled for covariates from childhood (sex, financial hardship, cognitive ability) and adulthood (cardiovascular medication use).

Results

In unadjusted models, youth with more overall social connections showed lower levels of SBP ($b=-4.14$, 95% CI=-5.56, -2.72) and DBP ($b=-2.70$, 95% CI=-3.68, -1.72). In the fully-adjusted models, social connections' associations persisted for SBP ($b=-2.52$, 95% CI=-3.99, -1.05) and DBP ($b=-1.97$, 95% CI=-3.00, -.95). A similar pattern was evident for connections with family members in fully-adjusted models (SBP: $b=-2.35$, 95% CI=-3.78, -.91; DBP: $b=-1.89$, 95% CI=-2.89, -.88). However, connections with other people were not significantly associated with blood pressure levels in fully-adjusted models (SBP: $b=-.98$, 95% CI=-2.43, .47; DBP: $b=-.68$, 95% CI=-1.70, .33). Social connections were not associated with pulse in any model.

Conclusion

Social connections in childhood were associated with healthier blood pressure levels in adulthood, but were not associated with pulse. Associations were stronger for connections with family members rather than with other people.

25) Abstract 1715

CHILDHOOD SOCIOECONOMIC DISADVANTAGE PREDICTS MIDLIFE INFLAMMATION

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Prior research has demonstrated that early-life socioeconomic disadvantage has long-term health consequences, including increased risk for cardiovascular and metabolic diseases at midlife. At the core of cardiometabolic diseases is low-grade systemic inflammation, which is often assessed via circulating levels of the pro-inflammatory biomarkers, C-reactive protein (CRP) and interleukin-6 (IL-6). CRP and IL-6 associate with childhood socioeconomic status (SES), but few studies have examined them concurrently.

The current study investigated the relationship of childhood SES with CRP and IL-6 in healthy midlife adults aged 30-54, raised in intact two-parent homes through at least age 13 (Adult Health and Behavior Study; $N=1,785$). Childhood SES was measured via two-factor

Hollingshead Index (education, occupational grade) at participant ages 5-10, and participants' adulthood SES was assessed analogously at time of study enrollment. IL-6 and CRP levels were assayed from a fasting morning blood sample.

Regression analyses controlling for demographic factors showed lower childhood SES associated significantly with higher CRP ($B=-0.002$, $SE=0.001$, $p=0.001$) and IL-6 levels ($B=-0.001$, $SE=0.000$, $p=0.042$), whereas adulthood SES was not related to these inflammatory markers. In addition, when childhood and adulthood SES were entered simultaneously, childhood SES remained a significant predictor of CRP ($B=-0.002$, $SE=0.001$, $p=0.002$), but not IL-6. Notably, associations became non-significant when further adjusted for adult health behaviors. These findings point to early origins of socioeconomic disparities in midlife inflammation, at least as indicated by circulating CRP, and results suggest this relationship may reflect developmental influences on adult health practices.

Supported in part by NIH grant PO1 HL040962.

26) Abstract 1219

PRELIMINARY EVIDENCE OF ALTERED GENE EXPRESSION IN ADULTS WITH TEMPOROMANDIBULAR JOINT DISORDER (TMJD)

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Background. Psychosocial stress has been shown to contribute to the development and persistence of pain in patients with Temporomandibular joint disorder (TMJD), one of the most common orofacial pain conditions in adults. Alterations in immune functioning, which can be observed in TMJD, is one promising biological mechanism linking psychosocial stress and pain. However, there is a gap in the understanding of molecular bases contributing to altered immune functioning in these patients. In the current study, we investigated whether the expression of genes and responses elements, which are known to regulate key inflammatory and antiviral processes, were related to TMJD status.

Hypotheses. Using the current understanding of altered gene expression characterized as the "Conserved Transcriptional Response to Adversity" (CTRA), the current study tested the hypothesis that patients with TMJD would exhibit an upregulation of inflammation-related genes and downregulation of antiviral genes compared to controls.

Methods. As part of a study funded by NIDCR (R00DE022368) to study inflammation, individuals with ($n=19$; 4 Males, 15 Females) and without ($n=17$; 2 Males, 15 Females) TMJD were recruited. Blood was collected in Tempus tubes for genome-wide expression profiling of mRNA from peripheral blood mononuclear cells. Using a bioinformatics approach, we examined if differences in gene expression between TMJD and controls was related to increases in inflammatory- and antiviral-related genes bearing response elements for proinflammatory (nuclear factor kappa B, NF- κ B) and antiviral (Interferon Response Factor) transcription factors, respectively.

Results. Compared with controls, TMJD patients showed a relative downregulation of genes bearing response elements for Interferon Response Factor and a relative up-regulation of genes bearing response elements for the proinflammatory transcription factor NF- κ B. Results also indicated an increase in the activity of CREB, which would be consistent with increased SNS activity - a known biological mediator of genes CTRA gene regulation.

Conclusions. We found increased expression of the CTRA transcriptome profile in patients with TMJD. Reduced antiviral and

elevated pro-inflammatory gene expression could be a molecular mechanism contributing to pain, somatic symptoms (e.g., fatigue, poor sleep), and psychosocial stress in TMJD.

27) Abstract 1234

PATIENT RACE AND OPIOID MISUSE BEHAVIORS INFLUENCE PROVIDER RISK PERCEPTIONS IN CHRONIC PAIN CARE

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Pain care guidelines recommend monitoring patients for opioid misuse. Clinical studies have found Black patients with chronic pain undergo more scrutiny about prescription opioids than Whites. Prior work suggests patient race and previous misuse behaviors interact to influence provider risk perceptions. Yet, there is a lack of experimental studies on this topic. In this study, 136 physicians viewed and made judgments about opioid-related risks for 8 virtual patients with chronic back pain who varied by race (Black/White). All patients were taking prescription opioids, but the vignettes varied such that half reported previous "yellow flag" misuse behaviors (e.g., early refill) and half reported adherence. Repeated measures ANOVAs indicated a race X misuse behavior interaction [$F(1,136)=5.53, p=.02$] for perceptions of patient risk for an adverse opioid-related event (e.g., accidental overdose). When patients reported previous adherence, providers rated Black patients as having higher risk for a future adverse event, but when previous misuse behaviors were present, no race differences emerged. Main effects of race [$F(1,136)=7.10, p=.01$] and misuse behavior [$F(1,136)=267.65, p<.01$] were found for perceptions of patient risk for abusing prescribed opioids. Providers rated Black patients and patients who reported previous misuse behaviors as having higher risk for future abuse. There was a race X misuse behavior interaction [$F(1,136)=25.10, p<.01$] for concerns about future medication diversion. When patients reported previous adherence, race differences did not emerge, but when patients reported previous misuse behaviors, providers had more concern about Black patients diverting their medication. Lastly, there was a main effect of misuse behavior [$F(1,136)=133.44, p<.01$] on concerns about addiction, such that providers had more concern about future addiction when patients reported previous misuse behaviors. Our results suggest racial differences in provider perceptions of opioid-related risk depend, in part, on the presence of other clinically-relevant information, namely previous yellow flag misuse behaviors. Racial stereotypes about treatment adherence and recreational drug use may also explain the results. Future studies are needed to better understand how longstanding racial disparities in pain care manifest in the context of the recent opioid crisis.

28) Abstract 1589

PTSD SYMPTOMS AND AVERSIVE COGNITIONS ABOUT SECONDARY PREVENTION MEDICATIONS IN STROKE/TIA PATIENTS

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Background: Post-traumatic stress disorder (PTSD) is common among stroke survivors, affecting 23% within the first year and persisting in up to 11% several years later. Stroke-induced PTSD has also been associated with nearly three times greater nonadherence to secondary prevention medications, though the underlying mechanisms remain poorly understood. Previously, we showed that patients with PTSD after suspected acute coronary syndrome were more likely to report aversive cognitions about their cardiovascular medications, suggesting that medications may serve as traumatic reminders of the cardiac event. Here, we explored whether a similar association exists among patients with stroke or TIA.

Methods: We enrolled a consecutive cohort of patients presenting to the emergency department with mild/moderate stroke or TIA. One month after discharge, we assessed PTSD symptoms specific to the index stroke/TIA event using the PTSD Checklist (PCL-S) and asked patients how often 1) did thinking about your stroke medication make you feel nervous or anxious; 2) did thinking about your stroke medication make you think about your risk for future strokes; and 3) did you skip or avoid taking your stroke medication so you would not have to think about your stroke or mini stroke. Logistic regression was used to estimate the association between PTSD and each aversive cognition, adjusting for age, sex, ethnicity, and depression (PHQ-8 score ≥ 10).

Results: Among 416 included patients (mean age 61 years, 53.4% women, 49.8% Hispanic), 10.8% had elevated PTSD symptoms (PCL-S ≥ 30). In unadjusted analyses, higher PCL-S scores were associated with increased nervousness/anxiety (OR 1.30 per 5-point PCL-S increase, 95% CI 1.19-1.42, $p<0.001$), thoughts of future stroke risk (OR 1.33, 95% CI 1.22-1.45, $p<0.001$), and skipping medications to avoid reminders of stroke (OR 1.28, 95% CI 1.12-1.47, $p<0.001$). In adjusted analyses, the association with increased nervousness/anxiety (OR 1.32, 95% CI 1.16-1.50, $p<0.001$) and thoughts of future stroke risk (OR 1.27, 95% CI 1.14-1.42, $p<0.001$) remained significant, but the association with skipping medications to avoid reminders of stroke did not.

Conclusion: Stroke/TIA-induced PTSD is associated with increased aversive cognitions about secondary prevention medications, which may explain the higher rate of medication nonadherence seen in these patients.

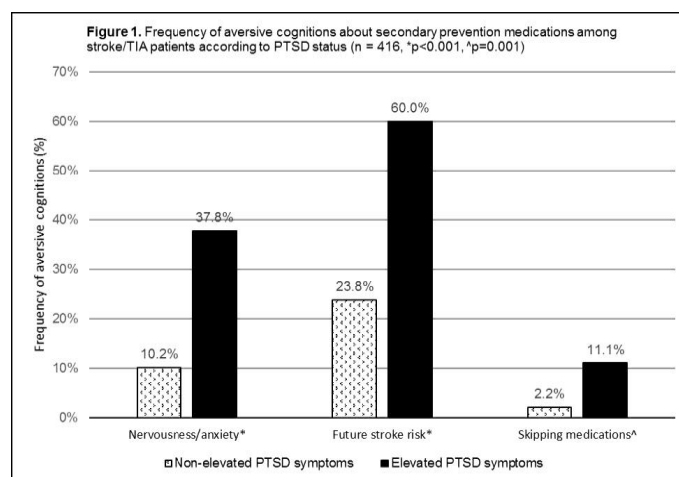


Table 1. Association between PTSD Symptoms and Aversive Cognitions about Stroke Medications

A. Thinking about stroke medication induced nervousness/anxiety (n = 416)

Characteristic	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)	p*
Elevated PTSD symptoms [†]	1.30 (1.19 – 1.42)	<0.001	1.32 (1.16 – 1.50)	<0.001
Age [‡]	-	-	0.99 (0.97 – 1.01)	0.491
Female [§]	-	-	1.46 (0.76 – 2.80)	0.260
Hispanic Ethnicity [¶]	-	-	1.18 (0.63 – 2.21)	0.612
Baseline Depression Symptoms [‡]	-	-	0.60 (0.23 – 1.52)	0.277

B. Thinking about stroke medication induced thoughts of future stroke risk (n = 415)

Characteristic	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)	p*
Elevated PTSD symptoms [†]	1.33 (1.22 – 1.45)	<0.001	1.27 (1.14 – 1.42)	<0.001
Age [‡]	-	-	0.97 (0.96 – 0.99)	0.001
Female [§]	-	-	1.58 (0.95 – 2.60)	0.076
Hispanic Ethnicity [¶]	-	-	1.45 (0.88 – 2.39)	0.145
Baseline Depression Symptoms [‡]	-	-	1.13 (0.56 – 2.29)	0.730

C. Skipped stroke medication to avoid reminder of stroke (n = 412)

Characteristic	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)	p*
Elevated PTSD symptoms [†]	1.28 (1.12 – 1.47)	<0.001	1.09 (0.88 – 1.35)	0.448
Age [‡]	-	-	0.99 (0.94 – 1.03)	0.548
Female [§]	-	-	1.93 (0.45 – 8.30)	0.378
Hispanic Ethnicity [¶]	-	-	2.95 (0.68 – 12.71)	0.147
Baseline Depression Symptoms [‡]	-	-	7.09 (1.28 – 39.19)	0.025

Abbreviations: PTSD – Post-Traumatic Stress Disorder; OR – Odds Ratio; CI – Confidence Interval

* p-values for adjusted ORs
[†] per 5-point increase on PCL-5
[‡] per 1 year
[§] versus Male
[¶] versus Non-Hispanic
[‡] PHQ-8 score ≥10 versus PHQ-8 score <10

30) Abstract 1774

RELATIONSHIPS BETWEEN OBJECTIVE AND SUBJECTIVE SOCIOECONOMIC FACTORS ON SELF-REPORTED HEALTH AND VASCULAR INFLAMMATION IN OLDER ADULTS WITH HYPERTENSION

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BACKGROUND. Psychosocial risk factors, including low socioeconomic status (SES), are associated with hypertension and cardiovascular disease. Pathophysiologic vascular inflammation is understood to partly mediate the effects of psychosocial risk factors on cardiovascular outcomes. Interestingly, subjective social status (SSS), or one's perception of their social rank, may confer additional risk of cardiovascular disease beyond SES alone. However, it is unknown whether SSS is independently associated with inflammation in older adults at risk for cardiovascular disease.

METHODS. Participants were 148 (age=72.2, SD=7.7) community-dwelling adults with well-controlled hypertension (SBP=133±1.6 mmHg). Self-reported physical functioning and mental wellbeing were obtained using the MOS SF-20. The MacArthur ladder rank scale captured SSS, and educational attainment and economic hardship were used for objective SES. Plasma C-reactive protein (CRP), vascular adhesion molecule-1 (sVCAM-1), and intracellular adhesion molecule-1 (sICAM-1) were assayed on a random subset of participants (N=82).

RESULTS. Economic and educational SES were uncorrelated ($X^2=0.40$, $p=0.53$) and unrelated to SSS ($X^2=2.15$, $p=0.34$; and $X^2=2.05$, $p=0.36$). Linear mixed-effects models revealed that poorer age-, sex-, and race-adjusted mental wellbeing was associated with lower SSS ($F(142,2)=5.11$, $p=0.007$), but was unrelated to objective SES. By contrast, poorer physical functioning was associated with economic hardship ($F(144,1)=6.72$, $p=0.01$), but less so with educational attainment ($F=2.91$, $p=0.09$) and SSS ($F=2.69$, $p=0.07$). Higher plasma CRP levels were related to poorer physical functioning ($b=-0.31$; 95% CI: [-0.53, -0.08]) and mental wellbeing ($b=0.23$ [0.01, 0.44], but were unrelated to SSS or SES. However, higher plasma sVCAM-1 ($b=0.26$ [0.03, 0.49]) and sICAM-1 levels ($b=0.24$ [0.00, 0.47]) were associated with lower educational attainment, and lower SSS was independently associated with higher sVCAM-1 ($b=0.32$, [0.01, 0.64]).

CONCLUSIONS. Lower SSS was associated with significantly worse mental wellbeing and somewhat poorer physical functioning, independent of objective SES. Furthermore, higher sVCAM-1, but not CRP or sICAM-1, was associated with lower SSS, independent of SES, illustrating the importance of SSS as a risk factor, and potential mediator, of vascular inflammation in aging.

31) Abstract 1778

PARENTAL EDUCATION AND SLEEP DURATION IN CHILDHOOD AND ADOLESCENCE: A META-ANALYSIS

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Background. Short sleep duration is prevalent in childhood and adolescence and has been linked to increased risk of obesity and health problems, poor socioemotional development, and academic difficulties. Children growing up in lower socioeconomic status (SES) backgrounds may be at higher risk for short sleep than their high SES counterparts; however, there are some conflicting results and the evidence in the area has yet to be synthesized. The objective of this

29) Abstract 1727

NEIGHBORHOOD ADVERSITY, DEPRESSION, AND HEART RATE VARIABILITY IN AN ELDERLY AFRICAN AMERICAN SAMPLE

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Objective. Heart rate variability (HRV) is an important measure of vagal cardiac regulation that has been implicated in psychopathology and cardiovascular disease (CVD) risk. Compared to lower resting HRV, higher resting HRV is generally associated with a more flexible automatic nervous system and better cardiovascular health. Depression has been associated with decreased HRV; however, this association has been shown to be reversed among middle-aged African American (AA) adults. Neighborhood adversity is a particularly salient stressor among AAs and has been associated with both heightened depression and decreased HRV. The current study tests the interrelationships among neighborhood adversity, depression, and HRV in a sample of community-dwelling older adult AAs.

Methods. Data were collected as part of the ongoing Health among Older Adults Living in Detroit (HOLD) study ($N = 100$, $M = 69.95$ yrs., $SD = 8.241$, range 50-89). HRV was collected while participants were sitting in a resting position for 5 minutes. Depression was measured using the 10-item Center for Epidemiologic Studies Depression (CESD) Scale. A neighborhood adversity index score was created from the 2017 American Community Survey, with scores matched to the participant's census block group.

Results. In correlational analysis, neighborhood adversity was not associated with depression, $r(98) = .1$, $p = .321$, nor was depression associated with HRV, $r(98) = .057$, $p = .572$. However, neighborhood adversity was negatively associated with HRV, $r(98) = -.269$, $p = .007$. Further, linear regression models revealed a significant neighborhood adversity by depression interaction ($b = -.510$, $SE = 146$, $p < .001$), such that neighborhood adversity was negatively associated with HRV among participants endorsing greater depressive symptoms.

Conclusion. Our findings suggest that neighborhood adversity is associated with HRV among older AA adults and that this link may be stronger among older AA adults with higher levels of depression.

meta-analysis is to investigate the association between parental education and sleep duration in children aged 0 to 18 years.

Methods. Four electronic databases (CINAHL with Full Text, PsycINFO, MEDLINE/PubMed, and Embase) were searched for terms related to sleep duration and parental education. Inclusion criteria included peer-reviewed scholarly articles that reported an association between maternal or paternal education and sleep before September 2018. Studies were excluded if the sample included children who were medically or psychologically unwell or no association between sleep duration and parental education could be obtained through the study or the author. Two reviewers determined the eligibility of all retrieved abstracts and full-text articles. Sample size, descriptive statistics, study procedure, variable measures, and relevant findings for parent education and sleep duration (hours or minutes) have been extracted.

Results. Searches identified 6080 potentially eligible studies, of which 1210 were selected for full-text review. A total of 33 studies met inclusion criteria and data and were extracted. Data across studies included 80, 255 unique participants. The pooled effect size, for studies that measured maternal education, suggest that less education was associated with lower sleep duration (Hedges' $g = 0.139$, 95% CI; 0.005-0.274, $p = 0.04$). This relationship between maternal education and child sleep duration was not significantly moderated by child sex, child race, or child age. The effect size for studies paternal education was also non-significant.

Conclusion. Establishing the relationship between parental education and sleep duration has policy and clinical implications. As the mothers' education level had a greater impact on the hours their children spent sleeping, psychoeducation about normative sleep durations may be best directed to mothers with lower levels of education.

32) Abstract 1475

RATE OF SARCOPENIC OBESITY AND ASSOCIATION WITH FUNCTIONAL MEASURES AND CARDIOMETABOLIC BIOMARKERS IN LONG-TERM HEMATOPOIETIC CELL TRANSPLANTATION (HCT) SURVIVORS WITHOUT MAJOR COMORBIDITIES

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HCT for hematologic malignancies is associated with cardiovascular and metabolic late effects as well as increased morbidity and early mortality. Despite often normal body mass index (BMI), a substantial number of pediatric HCT survivors meet criteria for obesity, sarcopenia, and sarcopenic obesity (SO) assessed by body composition, which are associated with other cardiometabolic risk factors. SO in long-term adult HCT survivors has not been defined. This study examined rates of obesity, sarcopenia, and SO in otherwise healthy, 18-50 year old, 5-20 year survivors of HCT. We tested the association of lean mass to fat mass to appendicular lean mass (FMI-ALMI) ratio, an indicator of SO, with physical function and cardiometabolic risk factors. Fifty-seven HCT survivors without major comorbidities completed a DXA scan, blood draw, spirometry, treadmill test, and grip strength test at the transplant center where they received HCT. Participants were a mean of 11.5 years post-HCT (SD=4.2), mean age 39.6 (SD=9.2), and 46% male. Using BMI, 10 (32%) of women and 14 (54%) of men were classified as overweight or obese. Using FM standardized criteria, 25 (81%) of women and 25 (96%) of men were classified as overweight or obese. By ALM criteria, 14 (45%) women and 8 (31%) men were classified as sarcopenic. Based on FMI and ALMI, 7 (23%) women and 4 (15%) men met criteria for SO. Partial correlations controlling for current age, sex, and cancer diagnosis found higher FMI-ALMI ratio was associated with lower aerobic endurance ($p < .01$) and was not associated with grip strength. Higher FMI-ALMI ratio was associated with higher levels of blood glucose, leptin, and C-reactive protein and lower adiponectin level ($p < .04$). FMI-ALMI ratio was not associated with systolic or

diastolic blood pressure, cholesterol levels, insulin-like growth factor 1, nor LPS-stimulated cytokines. Rates of obesity, sarcopenia, and SO are elevated in younger adult long-term HCT survivors without major comorbidities who appear healthy. FMI-ALMI ratio is associated with important cardiometabolic risk factors. Increasing physical activity to improve FMI-ALMI ratio could reduce risk for cardiometabolic late effects after HCT. Guidelines for HCT survivors need to include routine body composition measurement rather than relying on BMI, which can be within normal range despite elevated fat mass and reduced lean mass.

33) Abstract 1762

CHILDHOOD ABUSE HISTORIES CONTRIBUTE TO STEEPER INFLAMMATORY TRAJECTORIES ACROSS TIME

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Childhood abuse histories have been linked to heightened inflammation. This study assessed inflammatory trajectories across three years. Participants were a cohort of 85 healthy controls in a parent study of trajectories of health across three years among cancer survivors and healthy controls. The mean age of participants was 56.70 (SD=10.4) and they were 80.8% female with relatively healthy with low rates of medical comorbidities. The Childhood Experiences Questionnaire provided data on physical, emotional, and sexual abuse prior to age 18. In blood samples stimulated with lipopolysaccharide (lps), cytokines IL-6, IL-8, IL-1 β , and TNF- α were collected at each visit across the three years. A z score composite of these markers was used in all analyses to provide a summary inflammation measure. All analyses included age, sex, body mass index, and medical comorbidities as covariates. Multilevel growth modeling with random intercepts showed that inflammation rose more steeply across time for people with higher rates of physical ($p=0.05$) and sexual abuse ($p=0.02$), but emotional abuse did not reach significance ($p=0.08$). Post hoc analyses also demonstrated significantly higher loneliness (all $ps < 0.01 - 0.13$) and depression (all $ps < 0.01 - 0.05$) across visits in participants who were high in abuse histories compared to those with lower rates of abuse. Future research should subsequently examine factors linking abuse histories to changes in inflammation in adulthood. Overall, these data suggest that childhood adversity has lasting negative effects on inflammation through adulthood that may worsen over time. Inflammation is a risk factor for a number of chronic health issues and overall morbidity and mortality – thus highlighting the importance of examining factors that may contribute to higher inflammation across time. Childhood abuse is also associated with numerous poor long-term health problems throughout adulthood, including cardiopulmonary symptoms, chronic pain, obesity, gastrointestinal issues, and lower self-rated health. This pattern of results therefore suggests inflammation as a potential longitudinal mechanism linking childhood abuse histories to poor health in adulthood.

34) Abstract 1725

MINDFULNESS BASED STRESS REDUCTION IMPROVES SYMPTOMS AND ALTERS FUNCTIONAL CONNECTIVITY IN IRRITABLE BOWEL SYNDROME

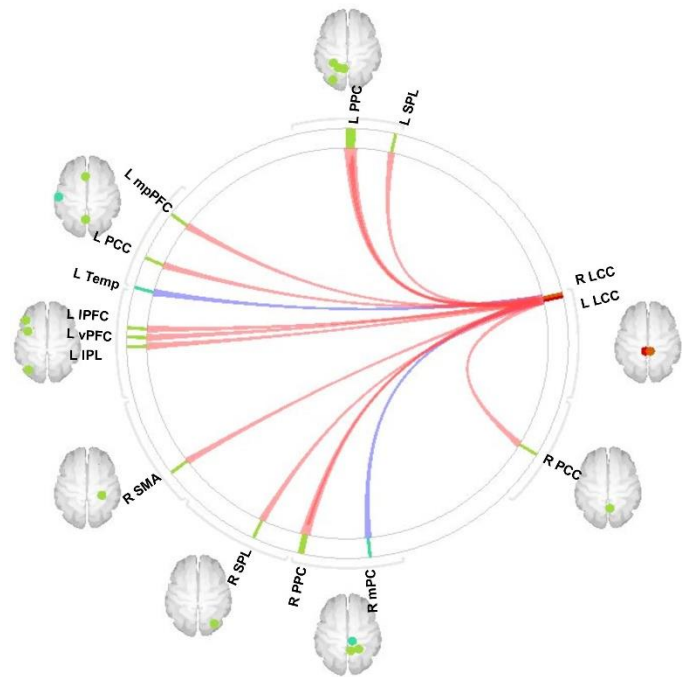
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Irritable bowel syndrome (IBS) is a chronic visceral pain disorder characterized by persistent abdominal pain and altered bowel habits. Neuroimaging studies have revealed symptom-associated anatomical and functional brain differences between healthy participants and patients with IBS. Mindfulness based stress reduction (MBSR) is a centrally targeted treatment known to induce brain changes associated-symptom improvement in patients with chronic pain. In this study we investigated whether MBSR would alter functional connectivity of the LCC, which is critical for arousal regulation and attention modulation and has been implicated in IBS pathophysiology.

Patients with IBS (n=42) completed an 8 week MBSR group treatment. The group underwent structural and resting-state magnetic resonance imaging pre- and post-MBSR on a 3T Siemens Prisma scanner. Mindfulness was assessed with the Five Facets of Mindfulness subscales and Mindfulness Awareness Attention Scale questionnaires. IBS symptoms were measured by the IBS Severity Scale. Functional connectivity analysis on resting state images obtained before and after MBSR was performed using the CONN toolbox. Dependent t-tests was used to determine post-pre differences. Spearman's rank correlation coefficient was used to assess correlations between changes in LCC connectivity and changes in symptoms and mindfulness.

Increases in LCC connectivity were observed post-MBSR in key dorsal attention regions including the bilateral superior parietal lobule ($t(41)=3.81$, $p=.0005$) ($t(41)=3.66$, $p=.0007$) which displayed moderate correlations with increased mindfulness as indexed by the FFM ($r=.37$, $p=.01$) and MAAS ($r=.43$, $p=.004$) total scores. LCC connectivity increased with the posterior cingulate cortex, a core default mode region, associated with decreased IBS symptom severity ($r=-.34$, $p=.027$). Reduced connectivity was observed between the LCC and the medial parietal cortex, a region in the salience network ($t(41)=-2.98$, $p=.0061$) with no correlation with symptom change.

MBSR resulted in alterations in the resting state functional connectivity between the LCC and attention and default mode network regions. Some of these alterations were associated with increased mindfulness and decrease IBS symptom severity. This study suggests that MBSR treatment changes brain functioning which may in turn result in reduce symptom severity in IBS.



POSTERS

35) Abstract 1632

NEUROENDOCRINE DOWNSTREAM OF BENEFIT FINDING AMONG CANCER PATIENTS

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Background: Cancer diagnosis evokes psychological turmoil that prompts not only despair but also resilience. Despite the significant health implications of finding meaning, the physiological downstream of resilience in cancer patients has been understudied. This study explored the extent to which various domains of finding benefit from cancer experience are associated with neuroendocrine biomarkers concurrently and prospectively.

Method: Newly diagnosed colorectal cancer patients ($M=55$ years old, 57% female, 50% Hispanic, 45% advanced cancer stage; 3 months post-diagnosis) participated in the study. Patients self-reported 6 domains of benefit finding from cancer around the time of diagnosis (T1). Saliva samples were collected 4 times a day on 2 consecutive days at T1 ($n=99$) and 1 year later (T2: $n=59$ at both times), from which salivary alpha-amylase (sAA)-a stress biomarker that is a proxy of sympathetic adrenal medullary (SAM) system and dehydroepiandrosterone-sulfate (DHEA-s)-an anti-aging and anti-stress biomarker, were assayed and corresponding diurnal slopes were calculated. Covariates included age, gender, ethnicity, and cancer stage.

Results: Patients reported moderate to high levels of various domains of benefit finding at T1. Hierarchical general linear modeling controlling for covariates revealed that cross-sectionally at T1, greater acceptance related to dysregulated diurnal sAA pattern ($B=-2.73, p=.041$) and family-appreciation marginally related to regulated diurnal sAA pattern ($B=2.35, p=.060$). Prospectively predicting neuroendocrine slopes at T2, controlling for those at T1, empathy related to dysregulated diurnal sAA pattern ($B=-5.61, p=.027$). None of benefit finding domains predicted diurnal DHEA-s patterns at T1 and T2.

Conclusion: Several domains of benefit finding predicted a salivary stress marker, not anti-stress marker, during the early phase of cancer survivorship. The biological cost of accepting the cancer diagnosis and increased appreciation of family since the diagnosis and the delayed biological cost of increased empathy due to cancer should be acknowledged. Investigations of long-term health consequences of finding meaning out of cancer experience and identification of other biomarkers that are sensitive to benefit finding phenomenon are also warranted.

36) Abstract 1337 will not be published

37) Abstract 1430

WORRY AND RUMINATION IN BREAST CANCER SURVIVORS: PERSEVERATION WORSENS SELF-RATED HEALTH

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Worry and rumination underlie anxiety and depression. These cognitive processes may also impact physical health, contributing to cardiovascular problems, increased risk of metabolic syndrome, and worse self-rated health. Despite considerable risk to psychological and physical health, worry and rumination have not been well studied in the context of cancer. This study examined how worry and rumination impacted self-rated physical health, particularly through their impact

on cancer related distress. Participants were women with breast cancer ($N=125$, mean age 52.45 [$SD=10.1$], 86% Caucasian) stages I-IIIa who completed surgery but had not yet begun adjunctive cancer treatment. During their study visit, participants completed measures of psychological (e.g., worry, rumination, cancer-related distress) and physical (pain, self-rated health, breast cancer symptoms) health. Body mass index, cancer stage, treatment type, menopause status, and age were included as covariates in all models. Results showed significant indirect effects of worry and rumination on each physical health outcome through cancer-related distress. Women who reported more worry also had higher cancer-related distress, which in turn predicted more breast cancer symptoms (indirect effect=0.003, $SE=0.001$, CI [0.001, 0.006]), pain (indirect effect=-0.224, $SE=.091$, CI [-0.417, -0.079]), and self-rated health (indirect effect=-0.21, $SE=.056$, CI [-0.184, -0.000]). Further, higher rumination contributed to more cancer-related distress, which predicted increased pain (indirect effect=-0.810, $SE=0.280$, CI [-1.428, -0.321]), worse self-rated health (indirect effect=-0.28, $SE=0.17$, CI [-0.679, -0.014]), and higher breast cancer symptoms (indirect effect=-0.093, $SE=0.005$, CI [0.001, 0.019]). Overall, these results suggest the importance of cancer-related distress as a pathway to poor health among those who experience greater worry and rumination. Future work should continue to explore ways to assess for and intervene on worry and rumination among breast cancer survivors. A better understanding of how these processes influence both distress and physical health may promote better outcomes and reduced distress throughout breast cancer treatment, with the goal of lessening the burden that a cancer diagnosis and cancer treatment have on functioning and quality of life.

38) Abstract 1895 will not be published

39) Abstract 1306

SOCIOECONOMIC STATUS AND INFLAMMATION IN WOMEN WITH EARLY-STAGE BREAST CANCER: MEDIATION BY BODY MASS INDEX

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Background:

Breast cancer is the most common cancer among women in the US and patients of low socioeconomic status (SES) show markedly poorer outcomes than those of high SES. A key pathway through which SES may be linked to health is inflammation. The current study tested the hypothesis that lower SES would be associated with elevated markers of inflammation in women recently diagnosed with early-stage breast cancer. We also examined body mass index (BMI) as a mediator of this association, given links between SES, BMI, and inflammation.

Methods:

Participants completed assessments after breast cancer diagnosis but before onset of adjuvant therapy, including measurement of height and weight (for BMI), questionnaires assessing demographic information, and blood samples for immune analysis. Assays measured two canonical pro-inflammatory cytokines, TNF- α and IL-6, and downstream markers of their activity, C-reactive protein (CRP) and the soluble TNF receptor type II (sTNF-RII). Education status was used to measure SES.

Results:

We categorized participants based on educational attainment: high school ($n=57$), college ($n=76$), and post-graduate ($n=61$). ANOVA identified significant between-group differences in IL-6, CRP, and sTNF-RII ($ps<.05$) and marginally significant differences in TNF- α ($p<.10$). Consistent with hypotheses, women with higher education (i.e., post-graduate degrees) had lower levels of IL-6, CRP, and sTNF-RII than women with high school degrees; those with college degrees

also had lower levels of sTNF-RII than high school graduates. Mediation models using a bootstrap approach to test indirect effects showed that BMI was a significant mediator of the relationship between SES and IL-6, CRP, and sTNF-RII, respectively, when comparing 'high school' and 'college' [95% CIs: -.327 to -.062; -.658 to -.142; -.093 to -.014] and 'high school' and 'post-graduate' participants [95% CIs: -.376 to -.093; -.767 to -.217; -.109 to -.019].

Conclusions:

In this sample of breast cancer patients, lower SES, as indicated by educational status, is associated with higher levels of inflammation. Further, this association appears to be mediated by BMI. Although cross-sectional, these findings highlight the importance of SES in the context of breast cancer.

40) Abstract 1488

BRAIN MORPHOLOGY AND STRESSOR-EVOKED BLOOD PRESSURE REACTIVITY IN DAILY LIFE: A MACHINE-LEARNING ANALYSIS IN MIDLIFE ADULTS

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Psychological stressors evoke increases in blood pressure that relate to risk for cardiovascular disease. Individual differences in stressor-evoked blood pressure reactivity may partly arise from the central nervous system contributions of limbic systems that may jointly appraise psychological stressors and regulate peripheral physiology, most notably via the amygdala and hippocampus. The amygdala and hippocampus both project to lower brainstem areas that regulate blood pressure. Two prior studies (N 's < 50) conducted on young adults found that reduced gray matter tissue volume in the amygdala and hippocampus correlate across individuals with greater stressor-evoked blood pressure reactivity in laboratory settings. The current study aimed to (1) conceptually replicate these findings in a large sample of midlife adults ($N = 446$; aged $M = 43.4 \pm 7.1$ years; 49.0% female) and (2) to extend these findings by examining stressor-evoked blood pressure reactions in daily life during. Ambulatory blood pressure and an electronic diary questionnaire were collected hourly across four days. Questions assessed current experiences of "task strain" (high demand and low control) and social conflict. Individual slopes were calculated for each participant representing the change in systolic blood pressure associated with increases in strain or conflict, after adjusting for time-varying confounds (e.g., speaking, activity, posture). Brain tissue volumes were derived from Freesurfer, v6 and SPM12, with a total of 84 regions-of-interest predictor variables. A range of machine learning and k-fold cross-validation approaches were used (e.g., elastic net and random forest regressions), with consistent findings across methods. The entire sample was first divided into training (80%) and testing (20%) sets. Within the training set, fair model fit with low error was achieved (range $R^2 = 0.025$ to 0.098 ; range $RMSE = 0.40$ to 1.0). However, these effects failed to generalize to the test set (range $R^2 = 0.012$ to 0.018 ; $RMSE = 0.099$). Moreover, models that perform feature selection failed to reveal either the hippocampus or amygdala volume as reliable predictors of blood pressure reactivity. The present findings do not support prior findings or the notion that amygdala and hippocampal tissue volumes are replicable neural correlates of daily life blood pressure reactivity to stress.

41) Abstract 1328

EXPLORING THE EFFECTS OF FLOATATION-REST ON BLOOD PRESSURE AND ITS INTERACTION WITH CHANGES IN STATE ANXIETY

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Background: Floatation-REST (Reduced Environmental Stimulation Therapy), an intervention that attenuates exteroceptive sensory input to the nervous system, has recently been found to reduce state anxiety across a diverse clinical sample (Feinstein et al., 2018a; Feinstein et al., 2018b). To further examine this anxiolytic effect, the present study investigated changes in state anxiety induced by Floatation-REST were related to blood pressure levels in response to immersion of the body in a solution of water saturated with 2000 pounds of magnesium sulfate.

Methods: Thirty-seven participants with high anxiety sensitivity (Anxiety Sensitivity Index-3 total score ≥ 30) and 20 healthy controls were recruited. A randomly assigned cross-over design was used, either a 90-minute session of Floatation-REST or an exteroceptive comparison condition, with a one-week washout period. State anxiety was measured before and after each condition, using the State-Trait Anxiety Inventory. Blood pressure was measured every 5-10 minutes using a waterproof, wireless blood pressure cuff. Blood pressure was modeled by linear mixed-effects models, including fixed effects of session, group, state anxiety change, and the interaction of session with state anxiety change while controlling for breathing rate and including participant- and nested time-specific random intercepts with an autoregressive correlation structure.

Results: Floatation-REST resulted in a lower systolic ($F(1,386)=6.26$, $p=0.013$; $d=0.22$) and dramatically lower diastolic ($F(1,386)=94.89$, $p<0.001$; $d=0.84$) blood pressure across the experiment when compared to the exteroceptive comparison condition. There was a significant interaction between condition, and state anxiety change score when predicting diastolic blood pressure ($F(1,386)=13.01$, $p<0.001$), such that, in the floatation condition, participants with lower diastolic blood pressure saw greater decreases in state anxiety, while the opposite was true in the exteroceptive comparison condition.

Conclusions: Floatation-REST induced a reduction in diastolic blood pressure as compared to an exteroceptive comparison control. Lower blood pressure in the floatation condition was associated with a greater reduction in state anxiety, suggesting that the unique effects of Floatation-REST on blood pressure may be contributing to its anxiolytic effects.

42) Abstract 1383

NEIGHBORHOOD DISORDER AND CAROTID INTIMAL-MEDIAL THICKNESS: MODERATING ROLES OF SEX AND AGE

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Background: Perceived neighborhood disorder (ND), both physical (e.g., abandoned buildings, trash) and social (e.g., crime), has been linked to greater blood pressure, body mass index (BMI), C-reactive protein, and smoking, independent of individual level socioeconomic status. Yet, ND has not been examined in relation to carotid intimal-medial thickness (IMT), a marker of subclinical atherosclerosis. The present study evaluated the relation between ND and carotid IMT as well as several sociodemographic moderators (i.e., age, sex, self-identified race).

Methods: Participants were 1208 African American and White urban-dwelling adults (M age = 47.3; 51% African American; 56% female; 39% living in poverty) from the Healthy Aging in Neighborhoods of

Diversity across the Life Span (HANDLS) study. Participants completed a 12-item self-report scale on ND. Five IMT measures were obtained from the left common carotid artery with ultrasonography, and averaged for analysis. Multivariable regression examined up to the 4-way interactions of ND, race, sex, and age (< 50 or ≥ 50 years) on carotid IMT, adjusting for poverty status.

Results: Backward elimination was performed in the absence of a significant four-way interaction. ND*sex*age emerged as a significant three-way interaction ($\beta = -.48, p = .032$), such that among older adults, greater ND predicted higher IMT in women but lower IMT in men; findings did not differ in younger adults. Hierarchical regression was subsequently conducted to explore factors that may account for this association, with the following entry of additional variables in 3 blocks: 1) cigarette and illicit drug use; 2) BMI, total cholesterol, and lipid-lowering medication; and 3) hypertension, diabetes, and history of cardiovascular diseases. The 3-way interaction became non-significant at stage 2, with the addition of BMI, cholesterol, and lipid-lowering medication ($\beta = -.42, p = .086$).

Conclusion: Our findings suggest that ND differentially impacts women and men of different age groups with regard to carotid IMT. Greater ND was related to higher IMT in older women but lower IMT in older men; these findings were partially accounted for by BMI, cholesterol, and lipid-lowering medication. Future studies are needed to unravel potentially differential mechanistic pathways in older women and men.

43) Abstract 1147

RELATIONS OF LEFT VENTRICULAR MASS AND COGNITIVE FUNCTION IN URBAN DWELLING AFRICAN AMERICAN AND WHITE ADULTS

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Background: Degree of hypertrophy of the left ventricle, indexed by greater LVM, is a measure of subclinical CVD that is prognostic of cardiovascular morbidity and mortality. Much is known about the relations of select subclinical CVD indices to cognitive function, yet relatively little is known about LVM-cognition associations.

Participants and Methods: Participants were 1,107 African American (AA) and White, urban dwelling adults (mean age = 52.19, 60.4% female, 56.5% AA, 34% below 125% of the poverty line) from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study. Exclusions were stroke, dementia, other neurological disease, HIV+ status, and known CVD. An echocardiogram measured key left ventricular dimensions to calculate LVM. Cognitive performance was assessed by: Digits Forward and Backward, Trail Making Test (TMT) A, and TMT-B, Brief Test of Attention (BTA), Benton Visual Retention Test, the California Verbal Learning Test, and semantic fluency (animals). Multivariable linear regression examined the interactive relations of LVM, race, and poverty status to each outcome. Covariates were added hierarchically in three steps: 1) age, sex, and education (base model), 2) body mass index, smoking status, diabetes diagnosis, and hypertension 3) left ventricular ejection fraction.

Results: There were no significant three-way or two-way interactions of LVM, race, and poverty status for any cognitive outcome. Backward elimination identified significant main effects of LVM on the BTA across all adjusted models (1st: $\beta = -0.098, p = .002$; 2nd: $\beta = -0.083, p = .019$; 3rd: $\beta = -0.084, p = .019$) and on TMT-B in the second and third models (2nd: $\beta = 0.073, p = .024$; 3rd: $\beta = 0.067, p = .037$). Greater LVM was associated with lower levels of performance on both measures.

Conclusion: To our knowledge, this was the first study that examined interactive relations of LVM, race, and poverty status to multiple domains of cognitive function. Results revealed that, irrespective of race or poverty status, those with higher LVM were vulnerable to

poorer performance on select tests of executive function. However, no associations were noted for basic attention, memory, working memory, or perceptuo-motor speed. These findings may reflect the early emergence of neurocognitive changes associated with enhanced cardiovascular risk in this largely middle-aged sample.

44) Abstract 1453

POWER OF NEGATIVE THOUGHTS: POST-TRAUMATIC COGNITIONS FOLLOWING A RELATIONSHIP STRESSOR LINKED TO PHYSICAL HEALTH

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Background: Interpersonal stress and trauma has been found to have a range of negative effects on an individual's physical and mental health. Relationship stressors, such as breakups or infidelity, can cause negative effects such as increased anxiety, depression and loss of sleep with some reports even paralleling symptoms of post-traumatic stress disorder (PTSD). Even though relationship stressors do not meet DSM-5 criteria, individuals experiencing PTSD symptomology following a relationship stressor may report intrusive and negative thoughts patterns, also known as post-traumatic cognitions (PTCs). PTCs have been associated with negative outcomes that hinder an individual's mental health, but minimal research has yet to examine the effect of PTCs on an individual's physical health.

Method: The present study examined the associations between PTCs and self-reported physical health in 336 young adults aged 18 to 30 (average age 19.7 yrs \pm 2.0; 71.1% female; 67.9% white) who had a break up in the past 5 years. A healthy subsample (N = 76; average age 19.7 yrs \pm 2.0; 77.6% female; 64.5% white) screened for mental and physical chronic conditions participated in a lab visit in which objective health marker data, such as resting blood pressure (BP) and resting heart rate variability (HRV), were collected.

Results: Hierarchical regression analyses, controlling for PTSD symptomology, number of traumatic experiences, current relationship status, body mass index, time since breakup, and sex, revealed PTCs as being negatively associated with self-reported physical health ($\beta = -.024, DR^2 = .10, p < .001$). Within the healthy subsample, PTCs were marginally associated with resting systolic BP ($\beta = .06, DR^2 = .03, p = .09$) and strongly associated with resting diastolic BP ($\beta = .09, DR^2 = .16, p < .001$), but not HRV.

Conclusions: Results suggest that having negative or maladaptive thought patterns following distress or trauma may hinder physical health potentially via dysregulation of the cardiovascular system, affecting 2 of 3 measures. Furthermore, the link between PTCs and resting BP may offer a critical point of intervention to reduce the future development of hypertension. Further work should investigate the specific mechanisms (e.g., psychological factors or health behavioral or both) by which post-traumatic cognitions influence our physiology to alter physical health.

45) Abstract 1034

THE EFFECTS OF CELL PHONE USE AND INTERNET DEPENDENCE ON BLOOD PRESSURE

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Objective: Mobile phones and the internet have become a pervasive part of today's society. Many Americans depend on their technology and fear losing access. The health effects of this dependence are unknown; cardiovascular disease risk associated with technology

dependence were assessed via 24-hour ambulatory blood pressure monitoring.

Methods: Healthy adults (N=50) ages 21-54 (M=27.3) were assessed using the media and technology usage and attitudes scales (MTUAS), task switching, anxiety/dependence measures, and perceived stress, to measure technology use and attitudes. Overnight blood pressure was captured via 24-hour ambulatory blood pressure.

Results: Higher anxiety/dependence (B=.400, $t=2.49$, $p=.019$) significantly predicted elevated nighttime systolic blood pressure (SBP) after controlling for task switching, negative attitudes, and perceived stress with the total model explaining 34% of the variance [$r^2 = 0.342$ $F(4, 27) = 3.505$, $p=.020$].

Conclusion: Anxiety due to separation from or dependence on a mobile phone or internet use elevates systolic blood pressure at night. Increased overnight SBP is a significant risk factor for cardiovascular disease that can lead to hypertension and health disparities.

46) Abstract 1149

INTERACTIVE RELATIONS OF PULSE WAVE VELOCITY AND SEX TO WHITE MATTER LESION VOLUME IN URBAN DWELLING AFRICAN AMERICAN AND WHITE ADULTS

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Background: Arterial stiffness, as indexed by pulse wave velocity (PWV), is a measurement of subclinical cardiovascular disease (CVD) that is associated with incident CVDs including stroke. Faster PWV, reflecting greater stiffness, has been associated with greater WMLV, an indicator of cerebral small vessel disease and prognostic indicator of stroke and dementia. Yet, it is unknown whether these relations vary by self-identified race or sex. Here, we investigated whether measures of PWV are differentially associated with WMLV as a function of race and sex.

Participants and Methods: Participants were 188 socioeconomically diverse, African American and White urban dwelling adults (M age = 51.5; 37% African American; 54% female; 31% living in poverty) from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) SCAN study. Carotid-femoral PWV was assessed using Doppler probes. Participants underwent 3.0-T cranial magnetic resonance imaging, including T1-weighted MPRAGE, T2, and FLAIR axial images. Automated segmentation of normal and pathological tissue was used to determine WMLV. Multivariable regression analysis, adjusted for age and poverty status, examined the two- and three-way interactions of PWV, race, and sex to WMLV.

Results: Backwards elimination, performed in the absence of a significant PWV \times race \times sex interaction, revealed a significant two-way interaction of PWV \times sex on WMLV ($R^2 = .098$, $F(8,179) = 2.422$, $p < .05$). For women, but not men, greater PWV was associated with greater WMLV ($b = .098$, $p = .01$). These interactions remained significant after further adjustments for systolic blood pressure, mean arterial pressure, diabetes diagnosis, hypertension diagnosis, body mass index, antihypertensive medication use, and cigarette use.

Conclusion: Results suggest that women may be more vulnerable to the negative impact of arterial stiffening, and associated pulsatility, on the development of cerebral small vessel disease. Findings support prevention efforts related to this sex-specific risk for stroke and dementia experienced by women.

47) Abstract 1491

HEART RATE VARIABILITY BIOFEEDBACK TO REDUCE PSYCHOLOGICAL DISTRESS IN PATIENTS AFTER ACUTE CARDIAC EVENTS: A PILOT STUDY

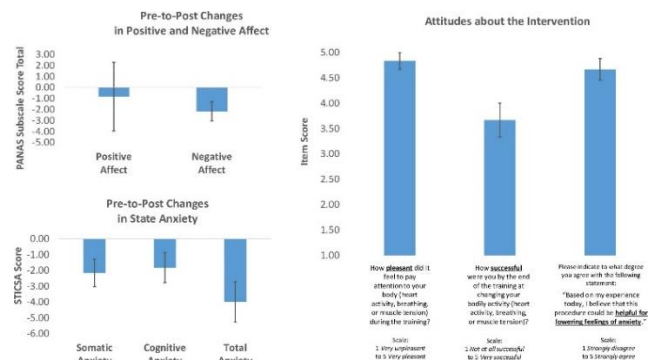
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Background. Some patients show persistent psychological distress after acute cardiac events (e.g., heart attacks). Distress is associated with autonomic imbalance marked by diminished parasympathetic activity that manifests as low heart rate variability (HRV). HRV biofeedback improves autonomic balance and reliably lowers symptoms of distress in people with anxiety. Research is needed to test whether HRV biofeedback is acceptable to patients after serious cardiac events and whether it reduces their anxiety.

Method. Patients participated in a 45-minute HRV biofeedback session, approximately two months after being recruited from the emergency department with suspected acute coronary syndrome. Patients were trained to breathe diaphragmatically at a frequency of 0.1 Hz (6 breaths/min) for 4 min and to maximize HRV while monitoring their breathing and heart rate for 4 min while wearing a respiration belt and a pulse plethysmography sensor. The Positive and Negative Affect Schedule and the State-Trait Inventory of Cognitive and Somatic Anxiety were administered pre- and post-training. Three 5-point Likert scales assessing intervention-related attitudes were administered post-training.

Results. Six patients (100% of those approached from a larger study) completed the session. They reported significant pre-to-post reductions in state anxiety, $t(5) = -3.16$, $p = .025$, a marginally significant reduction in negative affect, $t(5) = -2.48$, $p = .056$, but no change in positive affect, $t(5) = -0.27$, $p = .800$. One-sample t -tests comparing the attitude items to the scale midpoints revealed that patients felt the intervention task was highly pleasant, $t(5) = 11.00$, $p < .001$, they strongly agreed that the task could be helpful for reducing their anxiety, $t(5) = 7.91$, $p = .001$, and they did not strongly believe they were successful in changing their HRV during the single session, $t(5) = 2.00$, $p = .102$. (See the figure for descriptive statistics of all tests above.)

Discussion. This study supports the feasibility of enrolling and administering HRV biofeedback to cardiac patients. The preliminary results suggest that these patients are interested in improving HRV and lessening psychological distress via the intervention. Future controlled research will test home-based HRV biofeedback interventions that involve multiple training sessions with ambulatory HRV and anxiety as targets.



48) Abstract 1297
A QUALITATIVE ASSESSMENT OF GENDER- AND RACE-RELATED STRESS AMONG BLACK WOMEN

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Background: Chronic psychological stress has been associated with weight gain over time, less weight loss for participants in behavioral weight loss interventions, and other adverse health outcomes. Black women report higher levels of psychological stress than white women and display a higher prevalence of several conditions associated with psychological stress including obesity. Research also suggests that in addition to generic stressors, black women also experience a higher degree of race- and gender-related stress. To further explore this disparity to inform future stress management interventions for black women, we conducted highly structured focus groups to examine black women’s perspectives about stress.

Methods: Using the nominal group technique (NGT), 3 sessions (group 1: n=10; group 2: n=10; group 3: n=13) were conducted exclusively with black women to solicit participant responses to the following questions: 1) What are the top sources of stress for women?, 2) What are the top stressors specifically for black women?, and 3) How do these stressors affect weight? Using a systematic method, participants ranked responses in order of importance. Responses were compiled and tabulated to identify which statements were viewed as most important by respondents.

Results: Mean age and body mass index of participants were 43.0 ± 10.1 years and 35.1 ± 7.9 kg/m², respectively. Participants provided 52 unique responses as top sources of stress for women, 71 responses as sources of stress related specifically to black women, and 29 responses to how stressors relate to weight. There was some overlap in responses to questions 1 and 2, but top responses for each question differed with responses to question 2 highlighting stressors specifically related to black women (table 1).

Discussion: The findings of this study are consistent with previous work reporting that, along with generic stress, race- and gender-related stress contribute to the overall experiences of black women. This work adds qualitative depth to allow a better understanding of the unique sources of stress for black women. These gender- and race-related stressors should be considered when offering stress management interventions for weight loss and general health promotion among black women.

Table 1. Summary of the top 3 responses to questions presented in NGT sessions	
Questions	Top 3 Ranked Responses
What are the top sources of stress for women?	<ul style="list-style-type: none">• Health• Family• Relationships
What stressors relate specifically to black women?	<ul style="list-style-type: none">• Safety of children/Raising black kids• Being head of household/single parenting• Finances
In what ways do these stressors influence women's weight?	<ul style="list-style-type: none">• Emotional eating• No time for exercise• Eating fast food due to lack of time or money for healthy foods

49) Abstract 1360
LESSONS FOR IMPROVING MEDICATION ADHERENCE FROM THE MECHANISM-FOCUSED APPROACH OF THE NIH SCIENCE OF BEHAVIOR CHANGE PROGRAM

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Background. Patients fail to take approximately one out of every two of their prescribed medication doses to manage their chronic diseases. Nonadherence to prescribed medication regimens carries dramatic health risks and can substantially raise mortality risk for some conditions. For decades many costly and often complex randomized controlled trials (RCT) have been conducted aimed at improving medication adherence. Unfortunately, most of these interventions have been ineffective, and even the most promising ones have small effects on behavior.

Method and Results. Since 2015 the Common Fund of the National Institutes of Health (NIH) has supported an initiative called the Science of Behavior Change (SOBC) to apply an experimental medicine approach to behavioral research. The goal is to isolate and understand the mechanisms underlying successful behavior change in order to learn how to harness those mechanisms via interventions. SOBC research projects target hypothesized mechanisms of change as their primary outcomes in three broad psychological domains: self-regulation, stress and stress reactivity, and interpersonal and social processes. Just as basic-science experiments reveal the biological mechanisms of action by which pharmacological medications exert their effects on physiology, SOBC scientists use experiments to test potential psychological mechanisms by which behavioral interventions operate to understand the causal pathways leading to improved adherence behavior. SOBC has built a growing repository that tracks measures of putative mechanisms as they are (1) identified as potentially relevant, (2) measured validly and reliably, (3) influenced via interventions, and (4) validated or not validated as mechanisms of behavior change. There are currently 19 groups (6 UH3 and 13 R21/Revision) conducting research in this domain across a wide variety of health behaviors, hypothesized mechanisms, and intervention types.

Conclusion. Behavioral scientists must stop conducting interventions without evidence of the potential mechanisms they influence. Medication adherence remains a pressing concern despite decades of expensive research. To make progress, scientists must reliably and repeatedly demonstrate that particular interventions cause changes in properly measured mechanisms, which in turn are related to changes in the intended behavior.



50) Abstract 1543
ECONOMIC INEQUALITY-INDUCED INCREASES IN RISKY BEHAVIOR

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Global income inequality is on the rise, and has important implications for the health, well-being, and economic outcomes of both individuals and societies. Greater economic inequality is associated with shorter life expectancies, chronic disease morbidity, higher rates of crime and drug use, and risky economic decisions, including more gambling and greater consumer debt. Recent work has shown that inequality causes increases in risk taking during a gambling task (Payne et al., 2017). Here, we conceptually replicate this phenomenon using behavioral data from a within-subjects imaging study examining economic inequality-induced increases in risky behavior on the Balloon Analogue Risk Task (BART). Forty-six young adults played 50 trials of the BART, in which they pumped up virtual balloons to win points, but risked losing those points if the balloon popped before they chose to stop pumping and collect their earnings. Inequality was manipulated before each trial by showing participants graphs of the proportion of total points earned by “previous players,” which displayed either a highly unequal distribution (i.e., high-inequality condition) or a relatively equal distribution (i.e., low-inequality condition). To assess differences in risk taking as a function of inequality, two-tailed paired samples *t*-tests were conducted to compare the average amount of

pumping and how many balloons popped on average between the high and low inequality conditions. The first *t*-test revealed that on average, participants pumped up the balloons significantly more during the high-inequality condition ($M = 5.55$, $SD = 0.99$) than during the low-inequality condition ($M = 5.04$, $SD = 1.07$), $t(44) = 3.07$, $p < .05$. A second *t*-test indicated that participants popped significantly more balloons on average during the high-inequality condition ($M = 5.38$, $SD = 2.53$) than the low-inequality condition ($M = 3.91$, $SD = 2.67$), $t(44) = 3.62$, $p < .05$. Together, these findings further support that inequality may contribute to poor outcomes through increasing risky behavior. On-going imaging analyses will explore how economic inequality affects neural systems engaged during risk taking. Results from this study have important implications for our understanding of the mechanisms linking economic inequality to disparities in health and well-being.

51) Abstract 1503

EXAMINING THE RELATIONSHIP BETWEEN PERCEIVED STRESS AND PHYSICAL ACTIVITY IN AN ETHNICALLY DIVERSE POPULATION OF YOUNG ADULTS AT RISK FOR TYPE 2 DIABETES

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Research shows that psychosocial stressors have a deleterious effect on a wide range of mental and physical health outcomes. Specifically, constant exposure to elevated levels of stress can affect behavior by decreasing physical activity/exercise and increasing sedentariness. Racial and ethnic minorities present worse health than White Americans due to disparities that stem from discrimination, socioeconomic status, and environmental and acculturative stressors. The objective is to study the association between physical activity and stress among a population at risk for type 2 diabetes.

Among a population of young adult college students, the "Metabolic Stress Assessment (MeSA) study is examining biologic stress responses to the hypothalamic-pituitary-adrenal axis, and the inherent risk for type 2 diabetes (target $n=100$). The MeSA study uses various surveys to measure categories of stress college students within the population may be experiencing. This includes categories like psychosocial stress (perceived stress, academic, everyday discrimination and neighborhood stress) and environmental exposures (noise, air, tobacco exposure). For this analysis, the International Physical Activity Questionnaire (IPAQ) was used to measure physical activity and perceived stress was measured by the Perceived Stress Scale (PSS) 10-item. Currently, the MeSA study has 16 women and 8 men enrolled in the study ($n=24$, mean age: 21 ± 1.1 yrs) with a racial/ethnic distribution of 57% Hispanic, 21% Asian, and 22% other. Preliminary results show that using the IPAQ, those in the lower physical activity group have a higher mean PSS compared to those in the high physical activity group (mean 20.6 ± 1.6 vs 17.8 ± 1.8 , $p=0.217$). When using a stand-alone question on physical activity and sedentary behavior, initial results present that those in the lowest physical activity and highest sedentary behavior group had a higher PSS score compared to those in the highest physical activity group (mean 23 ± 2.9 vs 17 ± 2.1 , $p=0.385$).

As the MeSA study increases the population size, we hypothesize that higher perceived stress and other stressors will associate with lower physical activity and more sedentariness. Supplementary future aims will be to examine specific populations like Asian and Hispanic racial/ethnic groups, populations of whom are at increasing risk for obesity and type 2 diabetes.

52) Abstract 1826

MOOD-TOBACCO LINKAGES: INFLUENCES OF ETHNICITY ON URGE TO SMOKE AND TOBACCO-USE TRAJECTORIES ACROSS THE HIGH SCHOOL YEARS

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Background. Despite reductions in the prevalence of tobacco use among adolescents, more than one in four high school students report using a tobacco product within the past month with electronic smoking devices replacing tobacco cigarettes for many adolescents. Thus, the identification of factors that are associated with tobacco use trajectories during adolescence are of crucial importance. Survey and epidemiological studies indicate that the prevalence of tobacco use is related to ethnic differences, stress exposure, and feelings of anger/hostility. The use of ecological momentary assessment (EMA) in which moods, activities, urge to smoke, and tobacco use are determined approximately every 30min over the course of several days, twice a year, during all four high school years, represents a powerful method to examine ethnic differences in the mood-smoking trajectories.

Methods. Five hundred twenty-seven adolescents (258 female) completed electronic diaries approximately every 30 minutes for two 4-day intervals each year of high school (9th through 12th grade). Each electronic diary entry queried participants to answer questions about smoking behaviors, urge to smoke, and current emotional states including stress and anger.

Results. Separate mixed logistic growth models indicated significant interactions between ethnicity, year in high school, and emotions on diary reports of urge to smoke and on cigarette use. Among Latino youth ($n=57$) tobacco use was predicted by diary reports of stress and anger during 11th and 12th grades. In contrast, anger predicted lower urges to smoke as Latino transitioned from 11th to the 12th grade. For Asian-American youth ($n=97$), diary reported anger was associated with increases in smoking urges during the 9th and 10th grades and, in a pattern contrary to that of Latinos, they demonstrated reduced diary reports of urge to smoke during the 11th and 12th grades irrespective of anger ($n=97$). Among White youth ($n=286$) diary anger, but not stress, predicted increases in urge to smoke as well as smoking behavior across all 4 years.

Conclusion. Robust ethnic differences were observed in the initiation, use, and cessation of tobacco use as a function of emotional cues (stress, anger) and high school grade.

53) Abstract 1435

THE ASSOCIATION BETWEEN ETHNICITY AND ANXIETY WITH SLEEP IN PEDIATRIC PATIENTS RECOVERING POST-SURGERY

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Proper sleep is beneficial for pediatric patients recovering from outpatient surgery. Sleep related problems such as insomnia, nightmares, reluctance to sleep alone, etc. can have detrimental effects on a patient's physical health, which can lead to greater utilization of medical services in the future. Emotional functioning can be associated with experiencing sleep disturbances. Generalized anxiety disorder has been found to have a high comorbidity rate with insomnia. Unsurprisingly, anxious children have a higher incidence of postoperative sleep problems. Evidence suggests that aside from the biological need for sleep, sleep behavior can be impacted by social, environmental, and cultural factors. Prior research indicates that this is

the case for adult patients, however the association of both ethnicity and anxiety together and their effects on sleep have not yet been researched for pediatric patients undergoing surgery. The purpose of this study, therefore, is to examine how children's ethnicity and postoperative state anxiety may predict sleep behavior post-surgery, with the hypothesis that non-Hispanic White and Hispanic families have different cultural values that may have implications for sleep. Our sample included pediatric patients ages 2-13 years who underwent surgery at the Children's Hospital of Orange County. We evaluated the state anxiety levels and sleep behaviors of children ($N=121$) post-surgery, as reported by their parent or guardian as a part of a follow-up measure one day after surgery and collected information on child ethnicity. Results demonstrated that Hispanic children experienced worse sleep (i.e. having difficulty sleeping), the day after surgery, compared to non-Hispanic White children ($OR = 31.943, p = 0.051$). Children with higher anxiety experienced worse sleep the day after surgery ($OR = 3.712, p = 0.023$). These results show that patients with higher state anxiety or Hispanic patients experience worse sleep the day after surgery, compared to White patients or patients with less anxiety. Pediatric patients who are both Hispanic and have higher state anxiety may have difficulties with sleep behaviors post-operation. These results highlight the need to further assess the impact of cultural differences, and to focus on ethnicity when controlling for anxiety in studies directed towards pediatric care for patients post-surgery.

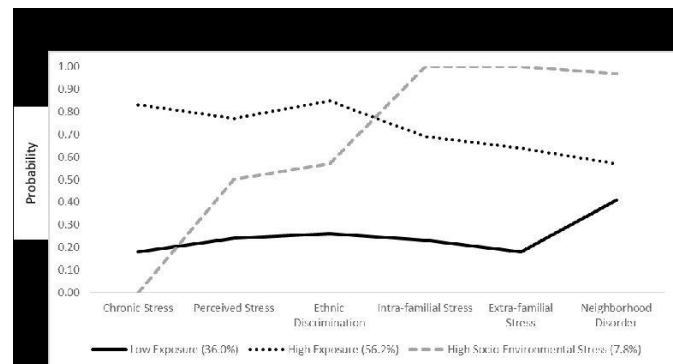
54) Abstract 1013

PROFILES OF STRUCTURAL VIOLENCE AMONG HISPANIC/LATINO PARENTS: RESULTS FROM THE HISPANIC COMMUNITY HEALTH STUDY/STUDY OF LATINOS (HCHS/SOL) YOUTH STUDY

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Introduction: Defined as "the macrolevel systems, social forces, institutions, ideologies, and processes that interact with one another to generate and reinforce inequities among racial and ethnic groups"—structural violence is implicated in the widening health disparities in U.S. ethnic/racial minorities. Hispanics/Latinos in the U.S. contend with many manifestations of structural violence—ranging from policies, to structural conditions, and personally-mediated forms, with plausible transgenerational impacts. The patterning of specific types of structural violence faced by Hispanic/Latino parents and their co-occurrence, however, remains unknown. We employed latent class analysis to identify patterns of structural violence exposure among Hispanic/Latino parents, with exploration of patterning by place of birth and length of U.S. residence. **Methods:** We analyzed cross-sectional data ($n=460$) of parents aged 23-71 of youth enrolled in the Hispanic Community Health Study/Study of Latinos Youth, who also participated in the Sociocultural Ancillary Study. Participants were recruited from four cities (Bronx, Chicago, Miami, San Diego). Six indicators or sequelae of structural violence were considered: chronic stress, perceived stress, racial/ethnic discrimination, intra-familial and extra-familial acculturative stress, and neighborhood disorder. Place of

birth and years in the U.S. were self-reported. **Results:** On average, participants were 38.2 years of age, 87.4% female, and 68.7% reported annual income $< \$20,000$. Model fit indices derived three patterns of structural violence exposure as follows: (1) *low-exposure* (36%), (2) *high-exposure* (56.2%), and (3) *high socio-environmental stress* (7.8%) (**Figure 1**). Hispanics/Latinos with < 10 years in the U.S. had lower odds of being in the *high-exposure* group vs. *low-exposure* group, when compared to their peers with U.S. residence of 10 years or more ($OR=0.60; p<0.05$). Those reporting *high socio-environmental stress* were more likely to be foreign-born ($\mu = 1.02; SE=0.05$), with U.S. residence ≥ 10 years ($\mu=0.92; SE=0.08$), and Spanish speaking ($\mu=1.05; SE=0.04$). **Conclusions:** Findings reveal specific patterning of structural violence exposure. Results can guide development of preventive interventions targeting Hispanic/Latino parents most at risk of experiencing certain types of structural violence domains and stressors.



55) Abstract 1549

CURVILINEAR ASSOCIATIONS BETWEEN CHILDHOOD INCOME AND THE CORTISOL AWAKENING RESPONSE IN ADOLESCENCE

Grant S. Shields, Ph.D., Center for Mind and Brain, LillyBelle K. Deer, M.A., Paul D. Hastings, Ph.D., Camelia E. Hostinar, Ph.D., Department of Psychology, University of California, Davis, Davis, CA Low childhood socioeconomic status (SES) has been associated with alterations in HPA axis activity. However, the evidence is mixed, with some studies linking low SES with hypoactivity of the HPA axis and others with hyperactivity of the HPA axis. These mixed findings led us to hypothesize that HPA axis activity relates to SES following an inverted-U quadratic function, with low SES predicting both the lowest and the highest cortisol output. We tested this hypothesis in the present study.

The present analysis makes use of data collected in the Avon Longitudinal Study of Parents and Children (ALSPAC)—a cohort study of parents and children in the UK ($N=15,445$). When these children were 15 years old, a randomly selected subsample of them ($N=3,020$) was invited to participate in a cortisol study. Of these, 968 participants provided at least one usable saliva sample. Mothers reported weekly family income at multiple waves, as well as their and their partner's education level. Early childhood income was operationalized as average reported weekly family income up to child age five. Sensitivity analyses were also conducted using parent educational attainment up to child age five. Cortisol awakening response (CAR), diurnal cortisol slope, and Area Under the Curve (AUC) were calculated. If the waking sample and the post-wake sample were separated by less than 15min or more than 45min, the CAR was treated as missing.

As hypothesized, low childhood income was associated with both the lowest and the highest levels of cortisol as indexed by the CAR (linear: $\beta=.09, t[733]=1.72, p=.09$; quadratic: $\beta=-.15, t[733]=-2.82, p=.005, R^2=.011$), but not as indexed by cortisol slope (quadratic $p=.08$) or cortisol AUC (quadratic $p=.14$). These results were consistent across multiple methods of addressing outliers and when controlling for relevant covariates. Sensitivity analyses revealed

that the same quadratic association emerged with the CAR when parent education up to child age five was used instead of income, quadratic $p=.002$. These results therefore indicate that low childhood income is associated with both hypo- and hyper-production of cortisol after awakening in adolescence. Future research should examine the mechanisms underpinning the development of HPA hypoactivation versus hyperactivation in adolescence, and explore the health implications of each activity pattern.

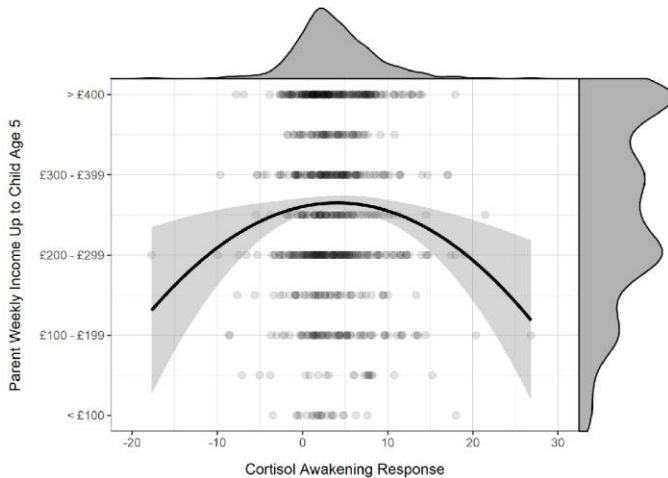


Figure 1. Low family income in early childhood prospectively predicted cortisol awakening responses in adolescents (i.e., at age 15). This curvilinear association was robust to multiple methods of quantifying and addressing outliers as well as to controlling for relevant covariates.

56) Abstract 1880

EFFECTS OF SOCIOECONOMIC STATUS ON SOCIAL SUPPORT, PERCEIVED STRESS, AND INFLAMMATION IN THE AFTERMATH OF A PETROCHEMICAL ACCIDENT

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Background: Low socioeconomic status (SES) has been consistently linked to a variety of poor physical health outcomes. One potential reason for these associations, as suggested by the Reserve Capacity Model, is that individuals from low SES backgrounds have less available interpersonal and psychological resources to cope with stressful situations, which, in turn, take a toll on biological processes implicated in health, such as systemic inflammation. Leveraging data collected before and after a petrochemical explosion, this study aimed to test the associations between SES and biobehavioral responses to the explosion.

Methods: Data were derived from 124 participants ($M_{age} = 55.9 \pm 16.1$, 69.4% females, 29.0% whites) living next to a petrochemical complex where the explosion occurred in 2005. At baseline, participants self-reported SES (i.e., education, income) and perceived stress and provided a blood sample to assess inflammatory markers (i.e., C-reactive protein [CRP], interleukin-6 levels [IL-6]). Perceived stress and inflammation markers were also assessed at post-explosion, as well as received and provided social support.

Results: Individuals from higher SES backgrounds reported receiving (but not providing [$b = -.01, p = .92$]) more social support ($b = .18, p = .046$) after the explosion than their lower SES counterparts. High-SES individuals also reported a smaller increase in perceived stress than low-SES individuals ($b = -.25, p = .004$) after the explosion. Moreover, SES was negatively associated with post-explosion IL-6 ($b = -.23, p = .004$) but not with CRP ($b = -.02, p = .80$), after controlling for baseline IL-6 and CRP. Received and provided social

support and perceived stress did not statistically explain the associations between SES and post-explosion inflammatory markers. These results did not change after controlling for sociodemographic covariates and objective exposure experiences.

Conclusion: Findings from this study elucidate how individuals from different SES backgrounds respond variably to an unexpected and acute stressor (i.e., explosion) in terms of received and provided social support, perceived stress, and inflammation. The differences in these psychosocial and biological responses to acute natural stressors associated with SES may be key biobehavioral mechanisms contributing to the persistent SES disparities in health.

57) Abstract 1551

HEALTH INSURANCE STATUS AND THREAT PERCEPTIONS IN ED PATIENTS AS A PREDICTOR FOR PTSD SYMPTOM DEVELOPMENT

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Background: Lack of medical coverage impacts the utilization of healthcare services. Insurance disparities disproportionately impact minority patients, particularly in low-income communities, leading to significantly elevated morbidity and mortality among patients seeking care for conditions such as acute coronary syndrome (ACS) in the emergency department (ED). Early ED threat perceptions are a robust predictor of subsequent PTSD symptoms, but it is unknown whether health insurance disparities may be associated with the development of PTSD symptoms or if socioeconomic status may amplify these associations.

Methods: Patients were enrolled into the Reactions to Acute Care and Hospitalizations (ReACH) study, an observational cohort study of psychological and cardiovascular outcomes of patients presenting to New York Presbyterian Hospital ED with suspected ACS. Participants were contacted post-hospitalization to determine post-traumatic stress disorder (PTSD) symptoms, hospital readmission, and recurrent CVD event/mortality. A moderated mediation model was run, with a chi-squared to see the relationship between education level and health insurance status. We ran the model with health insurance status as the predictor, PTSD symptoms at one month post-hospitalization as the outcome variable, ED threat perception as the mediator, and education status as the moderator variable. Covariates include age, Charlson Comorbidity Index, and GRACE ACS Risk Score.

Results: The analytical sample comprised of 886 patients. Education level and health insurance status were unrelated, $\chi^2 = 1.074, p = .300$. As predicted, greater threat perceptions significantly mediated the association between lack of health insurance and higher 1-month PTSD symptoms, $R^2 = .13, F(8, 877) = 16.83, p < .001$. Low education levels had a significant effect on threat perceptions, $2.65, SE = .860, p = .002, CI [-4.34, -.96]$, compared to patients with higher education, $-.574, SE = .56, p = .301, CI [-1.66, .52]$.

Conclusions: Greater ED threat perceptions significantly mediate the association between lack of health insurance and higher 1-month post hospitalization PTSD symptoms. Many factors have been shown to increase ED threat perceptions, including race, ethnicity, and education levels, putting many uninsured individuals at higher risk for the development of PTSD symptoms after a traumatic health event.

58) Abstract 1039

SEX DIFFERENCES IN STRESS ASSOCIATION WITH BODY MASS INDEX IN A COHORT OF AFRICAN AMERICANS

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Obesity is a leading health concern in the United States, contributing to cardiometabolic disease and mortality. Unlike other ethnic groups, there is a sex difference in obesity among African American (AA) with females having a rate of 56.7% versus 37.5% in males. The reason for this sex difference in obesity rates among AA remains to be definitively explained. The interaction of stress and obesity may possibly explain the sex differences in obesity prevalence. Previous research show that females report higher perceived stress scores on the perceived stress scale. In this project we propose that Body Mass Index (BMI) is positively associated with perceived stress and coping in AA females. Thus, AA females may have higher BMI due to coping strategies used to deal with perceived distress. We enrolled 95 African Americans (males, $n = 23$; females, $n = 72$) aged 18-70 from North Carolina Triangle region. Participants completed the Perceived Stress Scale (PSS), which was scored using perceived distress and perceived coping subscales. Saliva was collected for cortisol measurements and obesity was calculated via BMI. We observed no significant difference in age (24 ± 1 vs 26 ± 1), BMI (28 ± 1 vs 28 ± 1), or basal salivary cortisol (0.23 ± 0.03 vs 0.17 ± 0.02) between males and females, respectively. However, we did find significant differences between males and females in perceived coping (6 ± 1 vs 10 ± 0.1 ; $p < 0.001$) and perceived distress (13 ± 1 vs 17 ± 0.1 ; $p < 0.001$). Interestingly, in females, we found that BMI was positively associated with perceived coping ($p = 0.044$) and basal salivary cortisol levels ($p = 0.032$) whereas in males, we observed no significant association between BMI and coping or cortisol. We interpret these findings to mean that 1) the coping strategies chosen by females may help minimize the level of distress compared to males; and 2) the coping strategies chosen by females promote increases in BMI. We conclude from these findings that females choose coping strategies that minimize their stress but it is at the expense of increasing weight/BMI. Perhaps other coping options may be explored that AA females may use that will minimize distress but without the cost of gaining weight. (Values = Mean \pm SE)

59) Abstract 1900

TRAUMA-INFORMED YOGA FOR VULNERABLE POPULATIONS: EVALUATION OF A COMMUNITY-BASED PROGRAM

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Background: Trauma is highly prevalent among vulnerable populations, including those who are incarcerated or recovering from addiction. Trauma-informed yoga creates a safer yoga practice for individuals with a trauma history and may improve physical and emotional wellbeing. Here we report evaluation of a community-based trauma-informed yoga program.

Methods: Trauma-informed yoga classes were held in three types of settings: corrections and reentry, addiction treatment and recovery, and community and mental health facilities, all in the Portland, Oregon metropolitan area. Classes were led by trained volunteers from Living Yoga, a nonprofit organization. Program evaluation data were collected anonymously after class from May - June 2018 using a retrospective pre-post design. The questionnaire was designed by

Living Yoga staff to evaluate student wellbeing and use of yoga-based skills outside of class.

Results: Of 152 survey respondents, half (51%) were in corrections and reentry, 21% were in addiction treatment and recovery, and 28% were in community and mental health facilities. The majority of respondents (73%) were adults (≥ 21 years) and female (59%); 44% were members of a racial minority and 28% were members of a sexual minority. Evaluating statements about physical and emotional wellbeing, fewer respondents endorsed the following statements after class compared to before: "I feel pain in my body" (18% agreed after vs 51% before) and "I feel anxious or stressed" (6% vs 39%). Among 123 respondents who had attended more than one class, more respondents endorsed the following statements after attending several trauma-informed yoga classes compared to before starting yoga: "I deal with stressful situations easily" (57% agreed after vs 31% before), "I can deal with negative feelings" (63% vs 37%), and "When I notice my feelings, I choose how to act in a healthy way" (75% vs 39%). Of 106 respondents with a history of addiction, 79% endorsed the statement "I learn skills in Living Yoga class that help me maintain sobriety."

Conclusion: Community-based delivery of trauma-informed yoga provides access to yoga for vulnerable populations that have not typically participated in yoga. Trauma-informed yoga was reviewed favorably by students from both institutionalized and community settings. Improvements in physical and emotional wellbeing warrant formal study.

60) Abstract 1023

QUIET TIME, QUIET BIOLOGY: EXPERIMENTAL IMPACTS OF A SCHOOL-BASED MEDITATION INTERVENTION ON ADOLESCENT BLOOD PRESSURE

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Meditation interventions have received a great deal of attention in recent years, with interest in their potential to improve young people's stress levels and health. Studies in adults have found that meditation training can benefit both psychological functioning and indicators of physical health (Anderson et al., 2008; Goyal et al., 2014; Lane et al., 2007). Several school-based studies have also identified impacts of meditation on the blood pressure (BP) of adolescents at elevated risk for hypertension (Barnes et al., 2008). Yet much of the experimental evidence on the health impacts of meditation comes from studies in adults, making it less generalizable to adolescents or the context of a schoolwide intervention.

We address these limitations by adding a stress and health study to an ongoing RCT of Transcendental Meditation (TM). Participating schools adjusted their bell schedule to include twice-daily 15-minute periods of quiet. Through classroom-based random assignment, half of students were offered TM training, with the remaining students spending this time in self-guided quiet. At the end of the academic year, 307 students provided informed consent and had BP measured by trained research assistants.

The intervention was widely adopted: two thirds of students in the treatment group reported meditating at least three times per week (compared to less than 15% of those in the control group, $p < 0.001$). Intent to treat analyses estimate that Systolic Blood Pressure (SBP) is 2.26 mmHg ($p < 0.10$) lower among students offered training in TM, compared to those in the control condition, controlling for sex, age, and BMI. Impacts are concentrated among males, with estimates of -2.94 mmHg ($p < 0.10$) for SBP and -3.11 ($p = 0.02$) for pulse pressure. Additional results will be presented for risk of hypertension and the estimated effect of the treatment on those who receive the intervention. This study provides evidence that it is feasible for a schoolwide meditation intervention to impact adolescent blood pressure. It is meaningful to observe a difference in BP within a non-hypertensive sample of adolescents, given mounting evidence that BP reduction is

beneficial for health even at levels below those traditionally classified as hypertension. Findings will be discussed in relation to their implications for cardiovascular health and school-based interventions.

61) Abstract 1407 will not be published

62) Abstract 1604

ASSOCIATIONS BETWEEN SAVORING AND EATING DISORDER SEVERITY AMONG ADULT PATIENTS IN RESIDENTIAL TREATMENT

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Eating disorders (EDs) demonstrate treatment resistance (Halmi, 2013), necessitating the use of novel approaches to target underlying ED issues. One such approach targets underlying emotion regulation deficits that may be instrumental in ED behavior. Interventions employing mindfulness-based and emotion regulation strategies, such as savoring (prolonging emotional experiences; Bryant, 2003), have been utilized in treatments aimed to improve core ED issues (Kristeller & Wolever, 2011), but more evidence of their efficacy is needed.

Relational savoring (RS) is a therapist-led technique rooted in attachment theory, tailored to enhance feelings of connectedness and increase positive emotions by attuning to relational experiences (Borelli, et al., 2014); however, RS has never been tested within a sample of ED patients. Given the promising findings of nonrelational savoring treatments, interventions utilizing RS may be associated with positive outcomes in ED patients.

The current pilot study implements a general savoring intervention and a RS intervention in female adults receiving residential treatment for EDs ($N=36$; $M_{Age}=26.47$). The goals were 1) to investigate cross-sectional correlates of trait-like savoring ability at baseline and 2) to investigate the longitudinal trajectory of savoring quality, as measured by Linguistic Inquiry and Word Count (LIWC), during savoring tasks in two conditions.

At baseline, participants self-reported on their ED severity, *reminiscing* savoring ability, and internalized shame, and then were randomized into a RS (experimental) group or personal savoring (control) group to engage in four savoring sessions. Preliminary analyses revealed that trait-like savoring ability was negatively associated with ED severity ($r = -.42, p < .032$). Savoring ability was also significantly associated with internalized shame, such that lower levels of reminiscing were associated with higher levels of shame ($r = -.508, p < .002$). Given these associations, we hypothesize that later LIWC analyses of savoring tasks will reveal high usage of negative emotion words across both conditions, however, repeated RS tasks may be associated with fewer negative emotion words, more positive emotion words, and increased savoring ability. By the conference, we will collect data from $N=60$ participants and present LIWC analyses of savoring tasks to explore savoring quality.

63) Abstract 1578

EVALUATION OF A COMMUNITY BASED PARTICIPATORY RESEARCH COLLABORATION WITH LATINO CAREGIVERS OF CHILDREN WITH CANCER

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Healthcare disparities in mortality and quality of life among Latino youth with cancer and their families are well documented. However, there is a lack of community-focused research to understand the myriad reasons for these disparities and to develop avenues for intervention. Accordingly, the goal of this project was to engage in community based participatory research (CBPR) to create an equitable collaboration with the Latino community. We recruited $N = 6$ mothers of children who were being treated for cancer to form a community advisory board (CAB). Multiple meetings were held with the CAB and evaluated to ensure adherence to the following CBPR principles: 1. collaborative and equitable, 2. mutually beneficial, 3. co-learning process. Quantitative pre- and post-evaluations were given at two months and at one year after the start of the collaboration and open-ended interviews were conducted at 6 months. CBPR evaluations are not designed to generate data analyses, but rather to be used to assess group dynamics and satisfaction in the community-academia partnership. Overall, community members reported that they agreed ($n=3$) and strongly agreed ($n=3$) that the CBPR collaboration was important for the well-being of Latino families whose children undergo treatment for cancer. CAB members reported high levels of satisfaction with the collaboration after one year (Strongly Agree (SA) = 3, Agree (A) = 2, Somewhat Agree = 1), that the academic researchers used the knowledge generated by the CAB members (SA = 4, A = 2), endorsed a sense of ownership in the process and outcomes of the group (SA = 3, A = 2, Somewhat agree = 1), and felt heard and respected (SA = 3, A = 3). Members also reported feeling satisfied with their level of participation in the group meetings after one year (SA = 1, A = 5). All members reported via interview feeling listened to and validated and several members reported a preference for more regular meetings. Overall, we found that our CAB members were satisfied with the climate of our collaboration and content of our meetings. By following CBPR principles, we were able to form a collaboration with community experts that was equitable and respectful. Ensuring an equitable partnership with community experts is vital to conduct culturally relevant research and to develop interventions that are culturally appropriate and sustainable.

64) Abstract 1408 will not be published

65) Abstract 1460

PATIENTS' AND PHYSICIANS' PERCEPTIONS OF SOMATIZATION IN PRIMARY CARE: IS THERE A ROAD TO COMMON GROUND?

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Background: The therapeutic relationship is central to the experience in health care and is especially important when managing patients with somatization. Patients and physicians both describe frustrating experiences in this setting. Patients are discontent about their physician's failure to acknowledge their experience and physicians their report a lack of confidence in their ability to treat these patients. The goal of this research is to better understand the match and mismatch between patients' and physicians' perceptions of the patient-physician relationship, their goals and expectation for care.

Methods: A grounded theory study was conducted with patients and physicians from a family medicine at a teaching hospital. Purposeful sampling was used to recruit participants with high symptom severity, high health anxiety or both and the physicians who treat them. Patients and physicians completed semi-structured one-on-one interviews.

Results: Data analysis gave rise to several themes. Patients wanted medical expertise from their physicians. They also wanted interpersonal support. They described the need to have physicians truly

listen to their concerns, provide reassurance and validation of their experiences. Physicians, in contrast, wanted patients to identify psychosocial origins of their conditions (e.g., past trauma or current stressful life event). They also wanted their patients to agree on treatment goals and strategies (e.g., tracking symptoms, accepting referrals to specialists and placed importance on the continuity of care. Both physicians and patients expressed that long-term relationships contributed to satisfying care experiences.

Conclusions: This study contributes to a better understanding of the match and mismatch between patients' and physicians' perceptions of care in the setting of somatization. Findings may inform clinical and communication strategies for physicians.

66) Abstract 1731

EXTEROCEPTIVE AND INTEROCEPTIVE SENSORY SENSITIVITIES AND THEIR ROLE IN AFFECTIVE SYMPTOMATOLOGY IN AUTISTIC ADULTS

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Background: The effects of exteroceptive sensory sensitivities (ESS) on affective symptomatology in autistic adults are poorly understood. Challenging sensory environments may play a significant role in a variety of factors influencing the mental health of autistic individuals; socializing in noisy environments may be avoided, thus increasing rates of loneliness and anxiety. Research indicates a role of interoception, the central communication and sensory perception of visceral signals, for affective symptomatology in autistic individuals. The relationship between exteroceptive and interoceptive sensitivities is underexplored, but may contribute to anxious affect due to sensory overload.

Methods: Participants (N=52) were autistic adults between the ages of 18-65. Self-report measures assessed autistic traits (AQ/EQ), state and trait anxiety severity (STAI), feelings of loneliness (UCLA LS), exteroceptive sensory sensitivity (Glasgow Sensory Quotient), and subjective perception of bodily sensations (BPQ/MAIA). Participants also completed interoceptive testing to assess interoceptive signal detection accuracy. We used Pearson's correlation to quantify the bivariate relationships between all variables and a multivariate linear regression analysis to quantify the relationship between ESS and significant correlation variables.

Results: We found significant positive correlations between ESS and anxiety, loneliness, interoceptive accuracy, autistic traits and BPQ. A negative correlation was found between ESS and MAIA subscore 'Not Distracting'. Based on these correlations, we performed a multivariate regression analysis. The regression's three predictors explained 44.6% of the variance of ESS ($R^2=.446$, $F=12.357$, $p<.001$). Specifically, ESS had a significant positive relationship with autistic traits and BPQ, and a significant negative relationship with MAIA 'Not Distracting'.

Conclusions: Our findings suggest that ESS is strongly coupled to anxious affect and feelings of loneliness in autistic adults. ESS relates to accuracy in heartbeat detection, indicating a role for interoception in this association and is predicted by subjective sensitivity to internal signals and the degree of distraction from bodily sensations. This further suggests a role for internal signal processing in the effects of ESS and its association to anxious affect and feelings of loneliness.

67) Abstract 1771

ACCEPTABILITY AND FEASIBILITY OF A DIGITAL HEALTH INTERVENTION FOR POSTTRAUMATIC STRESS SYMPTOMS: AN ENTIRELY REMOTE STUDY

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Given the ubiquity of smartphones, we have an unprecedented opportunity to administer psychosocial interventions to large numbers of people, underserved and isolated populations, and stigmatized groups entirely remotely. Here, we present data on the acceptability and feasibility of a mobile app delivered to individuals with posttraumatic stress disorder (PTSD) symptoms in an entirely remote study. All recruitment was completed via paid advertisements on Craigslist and Reddit. Eligibility criteria included being over 18 years old, owning an iOS device, and reporting clinically significant PTSD symptoms (PTSD Checklist >33). Participants completed 12 days of training and three assessment days within 21 days, with daily activity including a threat-related attention bias modification paradigm (MacLeod, 1986) lasting approximately 15 minutes per day. In seven months, 2,627 people completed the screening survey and 1,694 were eligible. Of these, 689 participants completed at least one day of activity on the app. The majority of the sample identified as Caucasian (60%), with representation from African American (12.4%), Hispanic/Latino (12.9%), Asian (8.3%), and more than one ethnicity (8.4%). Participants hailed from 49/50 States and Washington D.C., and the household income distribution roughly matched the U.S. census with 54.5% earning below \$50,000, 32.3% between \$50,000-\$100,000, and 13.1% over \$100,000. Despite the presence of clinically significant PTSD symptoms, 47% had not seen any mental health specialist and 12% had only one mental health visit in the prior six months. Of the 689 participants who completed the baseline assessment on the app, 513 (75%) completed at least 10 of the 12 days of training and 488 (71%) completed the 5-week follow-up survey. Regarding the acceptability of the app, participants indicated that the training was convenient (3.9/5), enjoyable (3.2/5), and satisfying (4.1/5), and 91% reported they would engage with the app for six months if it reduced PTSD symptoms. Our data on recruitment, retention and acceptability indicate that app-based interventions are highly acceptable and feasible for a sample with clinically significant psychiatric symptoms. Mobile apps have strong potential for delivery of psychosocial interventions to vulnerable populations.

68) Abstract 1329

DISTRESS TOLERANCE AS A MODERATOR ON THE RELATIONSHIP BETWEEN PHYSIOLOGICAL REACTIVITY AND INTERNALIZING SYMPTOMS

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INTRODUCTION: Anxiety and depression co-occur often. Previous research indicates that individuals with anxiety have increased physiological reactivity, while depressed individuals have blunted reactivity. The link between physiological reactivity and comorbid anxiety/depression symptoms is less clear. Distress tolerance (DT; the perceived ability to experience and withstand negative emotional states) may influence this association. While research has linked poor DT to anxiety and depressive symptomatology, research examining the interplay of DT and physiological reactivity, a putative risk factor for these disorders, is lacking. This study will examine whether DT and physiological arousal interact to predict patterns of anxiety/depression comorbidity in emerging adults, who are at high risk for these disorders. **METHOD:** All data have been collected and analyses will be complete by December 2019. N = 136 college students completed the Trier Social Stress Task (TSST; 5-minute speech task and 5-minute math task meant to elicit a social stress response) while providing physiological data [skin conductance level (SCL) and heart rate variability (HRV)]. Participants completed the STAI-Trait scale and the BDI-II to assess anxiety and depression symptoms, respectively. The Distress Tolerance scale (DTS; Simon & Gaher, 2005) measured self-reported DT. To assess comorbidity patterns, three symptom groups were formed based on levels of anxiety and depression: (1) low anxiety/low depression; (2) high anxiety/high depression; and (3) high

anxiety/low depression. A score 43 and above on the STAI-Trait scale was classified as high anxiety, and 20 and above on the BDI-II was high depression. Multinomial logistic regression analyses will be performed to test whether DT interacts with SCL and HRV to predict membership in one of the three groups. **ANTICIPATED RESULTS:** We hypothesize that for individuals with lower levels of DT, higher physiological reactivity will be associated with higher anxiety, lower physiological reactivity will be associated with greater depression. **DISCUSSION:** Anxiety and depression are among the most prevalent psychological disorders affecting the U.S., with high comorbidity. There is a strong need to examine and identify risk factors so that better-suited preventative measures may be implemented. Study limitations and future directions will be discussed.

69) Abstract 1393 will not be published

70) Abstract 1477

OPTIMISM AND TELOMERE LENGTH AMONG AFRICAN AMERICAN ADULTS: CROSS-SECTIONAL ANALYSIS FROM THE JACKSON HEART STUDY

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Background: Growing evidence has observed that higher optimism is linked with greater longevity and better health outcomes. One possible biological mechanism that may mediate the optimism-health association is a slower rate of cellular aging, which can be represented by leukocyte telomere length (LTL). Several studies have reported null associations between optimism and relative LTL in predominantly White populations; however, no studies have examined the association among African Americans (AAs) despite evidence that LTL differs by race. We investigated whether higher optimism was associated with longer LTL among AAs, and also evaluated key potential effect modifiers.

Methods: We used cross-sectional data from AA men and women (N = 2,516) participating in the Jackson Heart Study. Optimism was measured using the Life Orientation Test-Revised scale at exam 1 (2000-2004). We considered optimism as a continuous variable and also as categories to assess potential threshold effects. Telomeres were measured using Southern blot. We ran three sets of multivariable linear regression models. The first model adjusted for sociodemographic characteristics (i.e. age, sex, income, marital status, occupation); the second model added health status (i.e. physical exam in the past year diabetes, hypertension, and cholesterol); and the third model further added health behaviors (i.e. physical activity, smoking status, nutrition, alcohol consumption and body mass index).

Results: This sample was comprised of 63.4% women and the mean age was 53.4. In age-adjusted models, optimism was not associated with LTL ($\beta=0.003$, 95%CI: -0.006, 0.012, $p=0.051$). This association remained null in the fully adjusted model ($\beta=0.006$, 95%CI: -0.003, 0.016, $p=0.718$), and when considering optimism as a categorical variable. No interactions were evident by age, sex, income, education, or body mass index.

Conclusions: Optimism was not associated with LTL among AA adults. This finding is consistent with evidence observed in predominantly White samples. Future studies should investigate alternative biological mechanisms that may explain the optimism-health association.

71) Abstract 1111

AIR POLLUTION AND SERUM INTERLEUKIN-6 IN CHILDREN

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Background: Inflammatory cytokines such as interleukin-6 have increasingly gained attention as biomarkers linked to stress exposure and predictive of future disease. However, we lack a complete understanding of the relevant factors that are associated with elevated inflammatory markers such as environmental factors. For instance, air pollution has been linked to increased risk of physical health problems with inflammatory underpinnings such as asthma and heart disease. Children may be especially susceptible to the effects of air pollution, given their higher intake of contaminants relative to their body weight compared to adults. PM2.5 is a measure of air quality that indicates the atmospheric presence of fine particles of 2.5 micrometers in diameter or smaller, which when inhaled can be detrimental to health. In the present study, we examined if air pollution indexed by PM2.5 was associated with a serum measure of inflammation in children.

Method: Participants were 79 children aged 9-10 years old (Mage = 9.92 years, SD = 0.58, 46.8% female) in California. Families' addresses were recorded and used to obtain average PM2.5 for their neighborhood during the month prior to a laboratory visit from records of the Environmental Protection Agency based on their locally installed monitors. Blood serum samples collected from children 30 minutes after arrival to a research laboratory were used for this analysis. Height and weight of the children were recorded in the laboratory and used to compute body mass index (BMI). Parents completed demographic information. A linear regression was conducted to determine the association between interleukin-6 (IL-6, log-transformed) and PM2.5, with or without adjustment for covariates (age, sex, total family income, and BMI).

Results: Analyses revealed a significant positive association between IL-6 and PM2.5 ($r = .23$, $p = 0.04$), which remained significant when adjusting for age, sex, family income, and BMI ($\beta = 0.24$, $p = 0.03$). BMI is a well-known correlate of inflammation. In our sample, BMI explained 12.9% of the variance in IL-6, whereas air pollution explained 5.7% of the variance in IL-6, independently of BMI and demographic covariates.

Conclusion: Indices of air quality near a child's home were associated with IL-6, and may be considered in future risk models of inflammation in children as they provide unique information.

72) Abstract 1010

FEAR OF MEDICAL PROCEDURES SPEEDS MUCOSAL WOUND CLOSURE

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Background: The healing of mucosal tissues is important in most surgical outcomes. Delays in healing increases the risk of infection and can lead to health complications. Chronic stressors have been shown to impair healing at all stages of wound repair. Conversely, evidence suggests that acute stress may enhance immunoprotective responses. The aim of this study was to examine the relationship between acute stress and oral mucosal wound healing rates. **Methods:** This study involved analyses of data collected across several studies. Participants (N=270, 49% female) ages 18 to 43 (22.5, SD±4.14) were primarily university students. Acute stress was operationalized as *fear of medical procedures*, a composite variable that collectively assessed self-reported fear of surgery, needles, and dental procedures. Standardized wounds were created by a periodontist under local anesthesia (2% lidocaine) on the roof of the mouth using a 3.5mm circular tissue punch and a scalpel to uniformly deepen the wound to 1.5mm. Wounds were videographed at 24-hour intervals for seven days to quantify wound

size. Blood was collected at baseline, 15, and 30 minutes post-wounding. **Results:** A median split controlling for gender was used to differentiate high and low fear individuals. High fear individuals had significantly higher levels of plasma cortisol compared to low fear individuals at 15 minutes ($t=-2.76$, $p=0.0063$) and 30 minutes post-wounding ($t=-3.29$, $p=0.0012$). While plasma cortisol levels were not significantly correlated with healing rates, there was a significant correlation between plasma ACTH levels at each time point and the number of days it took for wounds to reach a point of being 50% healed; higher ACTH levels related to faster healing. *Fear of medical procedures* was found to be a significant predictor of wound size ($\beta=-0.0184$, $p=0.0236$), with average wound size decreasing by 1.8% for every unit increase in fear score. **Discussion:** These findings provide support for the adaptive qualities of acute stress and highlight the importance of stressor-type when examining immune responses. The reduction in wound healing rate is most likely due to acute anticipatory stress (i.e., fear) of the procedure, resulting in elevated levels of glucocorticoids that produce beneficial effects on downstream mechanisms of inflammation in these tissues.

73) Abstract 1181

NON-GENETIC CHILDHOOD FACTORS OF HEIGHT ARE ASSOCIATED WITH COGNITIVE FUNCTION IN HISPANIC/LATINOS ADULTS. THE HISPANIC COMMUNITY HEALTH STUDY/STUDY OF LATINOS (HCHS/SOL)

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Childhood is a period of brain plasticity when environmental influences may have long-lasting effects. Early socio-economic adversity may affect cognitive reserve across the life span and higher risk of cognitive decline in adulthood. We hypothesized that among adults, the non-genetic component of attained height could reflect childhood environmental conditions limiting growth potential, and that these childhood conditions might be associated with cognitive function. Analysis included 4603 women and 2955 men (age 45-76 years) from HCHS/SOL. Childhood adversity was assessed by parental educational achievement. Non-genetic factors associated with height were estimated as the difference between attained height and genetically predicted height using height-associated SNPs, sex, and genetic ancestry. Positive values indicate taller attained stature than would be expected based on SNPs, suggesting favorable early environmental influence on height; negative values suggest environmental conditions limiting growth. Cognitive functioning measures included Six-Item screener, Brief-Spanish English Verbal Learning Test (B-SEVLT), Word Fluency test (WFT), Digit Symbol Substitution test (DSST). In this study, 90% were born outside the US, 39% did not graduate from high school, and 69% had income <\$30K. Low parental educational achievement was common, 55% of fathers and 59% of their mothers completed less than a middle school education. Individuals with low-education parents had greater negative

environmental influence on height, as evidenced by attained height below genetically predicted height. US born individuals and those with higher SES were taller than genetically predicted. Greater non-genetic early factors limiting growth was associated with lower cognitive functioning, adjusting for potential confounders (Six-item $\beta=0.02$, B-SEVLT-learning trials $\beta=0.17$, B-SEVLT recall $\beta=0.06$, WFT $\beta=0.25$, DSS $\beta=0.63$). Associations were attenuated by current educational achievement and income but remained significant for SEVLT-trials, WFT, and DSS. Adjusting for diabetes and hypertension did not affect results. There were small but measurable associations between childhood environmental factors and cognitive function, independent of adult education. Using genetic data could be useful to infer influence of early life factors on adult health when direct measures are not available.

74) Abstract 1920

NEUROVISCERAL INTEGRATION OF DORSOLATERAL PREFRONTAL CORTEX AND SELF-REGULATION INDEXED BY RESTING-STATE CONNECTIVITY WITH MEDIAL FRONTAL GYRUS

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Background: The dorsolateral prefrontal cortex (DLPFC) plays an integral role in self-regulation. A model for neurovisceral integration implicates DLPFC in self-regulation, i.e., cardio-autonomic, emotional, and executive control. At rest, the DLPFC is functionally connected to an executive control network (ECN) that includes medial frontal gyrus (MFG), thalamus, posterior parietal cortex, as well as cerebellum, anterior cingulate and left medial temporal lobe. Inhibitory processes involving DLPFC are proposed to underlie neurovisceral integration model. Task-based imaging studies show right MFG is integral to inhibitory control, thus functional connectivity of this region with the DLPFC is expected to correlate with multiple indices of self-regulation.

Methods: Psychophysiological and neurocognitive data was retrieved from 271 adults of the NKI-Rockland Study aged 18 to 85 years. Resting-state functional magnetic resonance imaging data was pre-processed, and signal extracted from aforementioned seed regions of the ECN (Shirer et. al., 2012). Z-scores indicating connectivity between each seed region and lateralized DLPFC was correlated with high frequency heart rate variability (HF-HRV) derived from resting photoplethysmography, executive control indexed by reaction time on the Attentional Network Task, and trait anxiety (TA).

Results: Functional connectivity of left and right DLPFC with ipsilateral and contralateral medial frontal gyrus were the only seed pairs in the ECN to correlate with all indices of self-regulation. Greater connectivity of the left DLPFC with right MFG predicted only HF-HRV after controlling for age, gender, BMI and impulsivity in the final model (Chi-square =.415, $p=.98$). As predicted functional connectivity of right DLPFC with left MFG predicted greater HF-HRV and executive control (Chi-square=.251, $p=.99$), whereas right DLPFC connectivity with ipsilateral MFG predicted greater HF-HRV, and lower TA (Chi-square=.21, $p=.99$) in the final models.

Conclusion: These findings broadly support a model for neurovisceral integration implicating medial frontal gyrus via functional connectivity with DLPFC at rest. Magnitude of effects for right DLPFC with a MFG region that includes the inferior frontal gyrus further supports the role of right hemisphere-based inhibitory control of cardio-autonomic, executive function and emotional processes.

75) Abstract 1640

THE SHARED EFFECTS OF GENETIC RISK AND PSYCHOSOCIAL STRESSORS ON BODY MASS INDEX: RESULTS FROM THE HEALTH AND RETIREMENT STUDY

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Genomics and psychological and social stressors independently play a significant role in increases in body mass index (BMI). The etiology of BMI is complex and is thought to reflect an interaction between psychosocial, environmental, and genetic risk factors, but few studies have examined how these risk factors interact to increase BMI. While emerging research suggests genetics and the environment interact to determine BMI, very little focus has been given to the environmental component of psychosocial stressors.

Using Health and Retirement study data of 5,227 sample of White adults, we conducted multivariate linear regression with a polygenic risk score for BMI (PGS-BMI) x psychosocial stress interaction. PGS-BMI was calculated as the weighted sum of alleles of 29 single nucleotide polymorphisms associated with BMI. Psychosocial stress was the composite score of individuals experiencing high levels of stress across six domains (i.e., childhood adversity, acute life events, financial strain, neighborhood stressors, relationship stressors, and everyday discrimination). Interactions for each covariate (sex, age, and education) with PRS-BMI and psychosocial stress were included in the model. We also included 10 principal components of the genotypic data in the model. The outcome was BMI based on self-reported height and weight.

We found that PGS-BMI interacted with psychosocial stressors on self-reported BMI ($p < 0.01$). Further analyses reveal that financial strain, everyday discrimination, and relationship problems interacted with PGS-BMI.

This study supports the idea that PGS x psychosocial stressors interactions combine to influence self-reported BMI. Replication is needed to better understand the role of genes and psychosocial stressors in the increase of BMI in understudied populations.

76) Abstract 1899

ANTICIPATED AND INTERNALIZED WEIGHT STIGMA ARE ASSOCIATED WITH DISORDERED EATING

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Disordered eating has been linked to adverse mental and physical health outcomes (e.g., depression, cardiometabolic dysfunction). One established risk factor for disordered eating and unhealthy weight control behaviors is weight stigma. Much of this research has focused on the consequences of experienced weight stigma. However, individuals can also both anticipate and internalize weight stigma without ever experiencing a stigmatizing event. No research to date has examined the unique impact of anticipation and internalization of weight stigma on disordered eating, independent of experienced weight stigma and potential confounders (trait negative emotionality, body mass index). This was tested in the present study. We also tested whether internalized and anticipated stigma mediates the association between experienced weight stigma and greater disordered eating.

Method: Individuals ($N = 168$) who meet BMI criteria for overweight or obese were recruited. Participants completed measures of anticipation of weight stigma, internalized weight stigma, and the Eating Disorder Examination Questionnaire Short (EDE-QS).

Results: A hierarchical regression was run predicting EDE-QS from weight stigma experiences, BMI, and negative emotionality in step one, and anticipated weight stigma and internalized weight stigma in step two. At step 1, weight stigma experiences ($\beta = .35, p < .001$) significantly predicted disordered eating over and above covariates. At step 2, anticipation ($\beta = .24, p < .005$) and internalization ($\beta = .39, p < .001$) of weight stigma were uniquely associated with

disordered eating risk, together accounting for 20% of the variance. Experiences with weight stigma were no longer a significant predictor. Tests of indirect effects using bootstrapping (Hayes, 2013) found that anticipation ($b = 1.15, SE = .43, 95\% CI: .32 - 1.98$) and internalization ($b = .93, SE = .28, 95\% CI: .46 - 1.56$) uniquely and significantly mediated the relationship between weight stigma experiences and disordered eating.

Conclusion: These findings suggest that it is important to examine anticipated and internalized weight stigma as independent risk factors for disordered eating. Moreover, anticipated and internalized weight stigma should be examined in future studies as potential intervention targets, as these constructs are modifiable compared to stigmatizing events.

77) Abstract 1440

INFANT WEIGHT GAIN PREDICTS AUTONOMIC NERVOUS SYSTEM REGULATION IN A HIGH-RISK SAMPLE

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Childhood obesity is highly prevalent in the United States and often associated with poorer physical and psychosocial health into adulthood (Skinner et al., 2018). Although the development of obesity is multidimensional (e.g., nutrition, birthweight, environment, biology; Mameli et al., 2016), increased weight gain during early infancy has been documented as an especially salient predictor of later obesity (Zheng et al., 2018). Further, preliminary studies suggest that obesity is related to autonomic dysfunction (Baum et al., 2013), which may be one pathway linking obesity to health complications such as hypertension, cardiac illness, and death (Costa et al., 2019). However, existing literature primarily focuses on autonomic nervous system (ANS) differences by weight class (i.e., with and without obesity) in older children and adults, rather than the potential impact of the development of pediatric obesity on ANS regulation.

This study examined how greater infant weight-for-length (WFL) gain during the first 6 months related to coordinated sympathetic (i.e., pre-ejection period) and parasympathetic (i.e., respiratory sinus arrhythmia) nervous system regulation in a racially and ethnically diverse sample of low-income infants born to mothers with high pre-pregnancy body mass index. Infants ($N = 60$) were exposed to a stress paradigm to elicit ANS responses during periods of parental disengagement (still face challenge) and playful interaction (baseline play & reunion). Findings demonstrated that less WFL gain in the first 6 months predicted a “classic reactivity response” (i.e., sympathetic activation and parasympathetic withdrawal) during the still face challenge. However, greater WFL gain over the first 6 months predicted a “classic reactivity response” during the reunion episode, suggesting that rapid weight gain in the first 6 months may be associated with autonomic dysfunction.

These findings demonstrate the impact of early rapid weight gain to influence ANS dysfunction. Further research across infancy may illuminate early risk factors as well as patterns of physiological dysfunction that may influence the process of sustained obesity risk and subsequent poor health outcomes (Guarino et al., 2017). By identifying the biological underpinnings of obesity development, research can inform community level intervention efforts targeted toward vulnerable youth.

Table 1. Predicting a profile 4 response to still face with prenatal stress variables

Variable	B	SE	p	OR	95% Confidence Interval	
					LL	UL
Sex (1=female)	1.256	0.600	0.036	3.511	1.083	11.384
WFL Change	-0.347	0.307	0.258	0.707	0.387	1.290
Breast Feeding	-0.557	0.647	0.389	0.573	0.161	2.034
Completed Both SF	-0.701	0.632	0.268	0.496	0.114	1.713
PSS prenatal	0.007	0.056	0.904	1.007	0.902	1.123
SLE prenatal	0.032	0.137	0.817	1.032	0.789	1.351

Note: Original models contained additional covariates that were removed listwise if they were not significant; intervention assignment, pre-pregnancy BMI, poverty, gestational age, birthweight, activity level, race/ethnicity; WFL = Weight-for-length, PSS = maternal reported perceived stress, SLE = stressful life events

Table 2. Predicting a profile 4 response to still face with concurrent stress variables

Variable	B	SE	p	OR	95% Confidence Interval	
					LL	UL
Sex (1=female)	1.153	0.620	0.063	3.167	0.940	10.677
WFL Change	-0.663	0.324	0.041	0.515	0.273	0.973
Breast Feeding	-0.683	0.613	0.265	0.505	0.152	1.679
Completed Both SF	-1.096	0.674	0.104	0.334	0.089	1.252
PSS 6months	-0.978	0.497	0.049	0.376	0.142	0.996

Note: Original models contained additional covariates that were removed listwise if they were not significant; intervention assignment, pre-pregnancy BMI, poverty, gestational age, birthweight, activity level, race/ethnicity; WFL = Weight for length, PSS = maternal reported perceived stress, SLE = stressful life events

Table 3. Predicting a profile 4 response to reunion with prenatal stress variables

Variable	B	SE	p	OR	95% Confidence Interval	
					LL	UL
Sex (1=female)	-1.197	0.901	0.184	0.302	0.052	1.766
WFL Change	1.919	0.786	0.015	6.814	1.460	31.793
Breast Feeding	1.953	1.206	0.105	7.047	0.663	74.855
Completed Both SF	-1.140	1.260	0.365	0.320	0.027	3.778
PSS prenatal	0.301	0.129	0.020	1.351	1.049	1.739
SLE prenatal	0.125	0.190	0.511	1.133	0.780	1.646

Note: Original models contained additional covariates that were removed listwise if they were not significant; intervention assignment, pre-pregnancy BMI, poverty, gestational age, birthweight, activity level, race/ethnicity; WFL = Weight for length, PSS = maternal reported perceived stress, SLE = stressful life events

Table 4. Predicting a profile 4 response to reunion with concurrent stress variables

Variable	B	SE	p	OR	95% Confidence Interval	
					LL	UL
Sex (1=female)	-1.026	0.795	0.197	0.358	0.075	1.703
WFL Change	1.011	0.450	0.025	2.748	1.138	6.638
Breast Feeding	0.764	0.834	0.360	2.146	0.419	10.997
Completed Both SF	-1.100	1.266	0.385	0.333	0.028	3.981
PSS 6months	0.742	0.666	0.265	2.100	0.570	7.744

Note: Original models contained additional covariates that were removed listwise if they were not significant; intervention assignment, pre-pregnancy BMI, poverty, gestational age, birthweight, activity level, race/ethnicity; WFL = Weight for length, PSS = maternal reported perceived stress, SLE = stressful life events

78) Abstract 1607

APPROACH-ORIENTED AND AVOIDANCE-ORIENTED COPING ARE ASSOCIATED WITH WEIGHT BIAS INTERNALIZATION AND SOCIAL PHYSIQUE ANXIETY

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Background: Weight bias internalization is the process wherein negative weight-based stereotypes are internalized and self-directed, and is associated with poorer health. Social physique anxiety is the apprehension one feels regarding others' judgment of their body, and is associated with disordered eating behaviors. Coping strategies may affect individual susceptibility to both. In particular, approach-oriented

coping is generally related to better health outcomes and avoidance-oriented coping is related to poor health outcomes. We hypothesized that higher approach-oriented coping and lower avoidance-oriented coping would be related to lower weight bias internalization and lower social physique anxiety. **Methods:** A pilot sample of undergraduate students (N=214; 87.4% female; mean BMI = 23.95) who have experienced weight stigma completed an online questionnaire about weight stigma, coping strategies, and physical and psychological well-being. Multivariate linear regressions tested approach-oriented coping and avoidance-oriented coping as predictors of weight bias internalization and social physique anxiety, controlling for BMI and gender. **Results:** Greater use of approach-oriented coping ($b=-0.54$, $p<.001$) and lower use of avoidance-oriented coping ($b=0.96$, $p<.001$) were significantly related to lower weight bias internalization [$R^2=.36$, $F(4, 209)=31.25$, $p<.001$]. Approach-oriented coping ($b=-2.85$, $p=.002$) and avoidance-oriented coping ($b=3.42$, $p=.002$) were also significantly related to social physique anxiety in the same directions [$R^2=.20$, $F(4, 209)=13.99$, $p<.001$]. **Conclusion:** Higher approach-oriented coping and lower-avoidance-oriented coping were associated with lower weight bias internalization and lower social physique anxiety. Promoting approach-oriented coping and reducing avoidance-oriented coping may help individuals buffer against the negative health effects of weight stigma.

79) Abstract 1412

THE RELATIONSHIP BETWEEN SLEEP PROBLEMS AND CORTISOL IN PEOPLE WITH TYPE 2 DIABETES

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Background: Sleep problems are linked with negative health outcomes, including coronary heart disease. Neuroendocrine dysfunction has been associated with sleep problems and may be a pathway linking sleep and ill health. Dysregulated cortisol output has been observed in people with type 2 diabetes (T2D), though little is known about the links between sleep and cortisol in this population at high risk of coronary disease.

Method: This study investigated the association between sleep problems and cortisol in response to acute laboratory stress and over the course of an ordinary day in a sample of 129 individuals with T2D. Sleep problems were assessed using the Jenkins sleep problems questionnaire. Mental stress was induced using two five minute laboratory stress tasks: a mirror-tracing task and the Stroop color-word interference task.

Results: Sleep problems were negatively associated with cortisol immediately post-task ($B = -0.030$, $C.I. = -0.059$ to 0.000 , $p=0.048$) and 45 minutes post-task ($B = -0.037$, $C.I. = -0.072$ to -0.002 , $p=0.039$) adjusting for age, sex, marital status, education, household income, body mass and smoking; indicating that those who experienced greater sleep problems had lower cortisol concentrations after stress. Sleep problems were positively associated with daily cortisol area under the curve ($B = 17.051$, $C.I. = 6.547$ to 27.554 , $p=0.002$) in fully adjusted models, suggesting that those with greater sleep disturbance had greater cortisol concentrations over the course of a normal day. Participants reporting greater sleep problems also had raised evening cortisol levels ($B = 0.96$, $C.I. = 0.176$ to 1.746 , $p=0.017$) in adjusted models.

Conclusions: Sleep problems were associated with disturbances in cortisol responses to stress, as well as changes diurnal cortisol output in people with T2D. Further research is needed to assess if neuroendocrine disturbance increases the risk of cardiovascular disease in this population.

80) Abstract 1333**ACHIEVING HEALTH EQUITY THROUGH PSYCHOEDUCATIONAL COMMUNITY WORKSHOPS ON NUTRITIONAL, EMOTIONAL, AND PHYSICAL WELL BEING**

Rebecca Bokoch, PsyD, Couple and Family Therapy, Alliant International University, Alhambra, CA, Noah Hass-Cohen, PsyD, Couple and Family Therapy, Lisa Liu, PsyD, Clinical Psychology, Alliant International University, Alhambra, CA

Overeating, obesity, and diabetes are, affecting 93.3 million of U.S. adults in 2015-2016 (CDC, 2019). These physical problems are exacerbated by dimensions in diversity (Caprio et al., 2008) and mental health issues, such as: chronic depression (Pratt & Brody, 2014), a history of childhood trauma (Williamson, Thompson, Anda, Dietz, & Felitti, 2002), and stress (Hackett & Steptoe, 2017). Psychosocial interventions like support groups, cognitive behavioral therapy, mindfulness, and acceptance, have been shown to be effective (McDonnell & Garbers, 2018), yet short term interventions are needed to meet the needs of a diversity of people. This poster will share findings from a pilot study, which explored the effectiveness of preventative community workshops for mental health professionals and community members intended to address the stigma and stress related to overeating, obesity, and diabetes. Participants ($N = 75$) of this pilot study included adults from diverse, low-income communities who were disproportionately impacted by these problems, and mental health providers serving these communities in need. This program evaluation used a pre-test post-test one-group design. It is hypothesized that levels of hope and motivation to change health and eating behaviors will increase, and psychological connections between stress and eating will decrease. The data has been collected and the results will be shared at the time of the conference. In addition, suggestions for ways to implement these practices incorporating food and wellness into mental health care, and ways to improve these workshops and trainings will be discussed.

81) Abstract 1810**DEPRIVATION AND THREAT AS LINKS BETWEEN EARLY LIFE SES AND EXECUTIVE FUNCTIONING OUTCOMES**

Sarah C. Vogel, BA, Rosemarie E. Perry, PhD, Annie E. Brandes-Aitken, BA, Stephen E. Braren, BA, Applied Psychology, New York University, New York, NY, Clancy Blair, PhD, Population Health, New York University School of Medicine, New York, NY

Research on early life adversity has begun a shift from cumulative risk approaches to more dimensional approaches. One such dimensional approach to understanding early life adversity uses dimensions of deprivation and threat to differentially predict developmental outcomes, however this framework has not been applied to the context of poverty-related adversity, which encompasses more than deprivation and threat and is characterized by high levels of both these dimensions. Previous studies have found that experiences of deprivation, but not threat, predict executive functions (EF). We propose a model of deprivation and threat as dimensions of poverty-related adversity, and we hypothesized that deprivation, but not threat, would mediate links between early life socioeconomic status (SES) and EF. Data come from the 15-, 24-, and 48- month visits of the Family Life Project ($n=1,292$).

We used latent variables of deprivation and threat in a multiple mediation model with SES as the main predictor, deprivation and threat as mediators predicting 48 month EF. Lower SES was related to higher levels of both deprivation ($\beta = -0.597$, $p < 0.01$) and threat ($\beta = -0.628$, $p < 0.01$). Additionally, deprivation ($\beta = -0.916$, $p < 0.01$), but not threat ($\beta = 0.307$, $p = 0.112$) was significantly negatively related to EF outcomes. The indirect effect of SES on EF through deprivation was significant ($\beta = 0.548$, $p = 0.013$). Finally, deprivation and threat together fully mediated the relationship between SES and EF. Implications for mental and physical health for children growing up in high-poverty contexts will be discussed.

82) Abstract 1893**EXERCISE AS A PROTECTIVE FACTOR FOR NATIVE HAWAIIANS WHO HAVE EXPERIENCED INTERPERSONAL TRAUMA IN CHILDHOOD OR ADOLESCENCE**

Joanne Qina'au, MA, Psychology, University of Hawai'i at Manoa, Honolulu, HI, Patrick L. Hill, PhD, Psychology, Washington University, St. Louis, MO

Native Hawaiian individuals report higher rates of early life trauma as well as higher rates of chronic physical illness and psychopathology. Given that exercise has positive impacts on physical and mental health, it may also serve as a protective factor in the development of poor health outcomes in adulthood following trauma. The present study investigated factors contributing to wellbeing (i.e., satisfaction with life and self-rated health) and posttraumatic sequelae (i.e., dissociation, avoidance, interpersonal difficulty) for individuals with exposure to interpersonal trauma in childhood or adolescence (ITCA) using a dataset from a longitudinal study cohort ($n = 989$) made up of ethnically diverse older individuals (mean age = 64) in the state of Hawai'i. Five univariate general linear models were used to explore the unique effects of: exercise; ITCA level; Native Hawaiian status; interactions with ITCA level; and interactions with Native Hawaiian status on the dependent variables: posttraumatic sequelae (i.e., dissociation, avoidance, interpersonal difficulty) and aspects of wellbeing (i.e., satisfaction with life, self-rated health). Exercise was a significant predictor of self-rated general health ($p < .05$, partial eta squared [PES] = .041), dissociation ($p = .001$, PES = .028), and satisfaction with life ($p < .05$, PES = .026). Exposure level to ITCA differentially predicted satisfaction with life ($p < .05$, PES = .012). No additional significant interactions were found between exposure to ITCA and posttraumatic sequelae nor aspects of wellbeing. Being NH or not interacted with exercise to predict dissociation ($p < .05$, PES = .015), and interpersonal difficulty ($p = .053$, PES = .009). These findings support evidence in the extant literature suggesting that processes in posttraumatic experience are significantly associated with poor health-promoting behaviors such as exercise. While inconclusive, these results may imply that for NHs, exercise is a uniquely important activity in preventing dissociation, or that levels of dissociation already present in the NH group play a role in disengagement from exercise. Future research should consider if exercise holds benefits across different forms of trauma, including the compounding impact of historical trauma or broken attachment bonds to 'aina (land).

83) Abstract 1332**INTRAINDIVIDUAL ASSOCIATIONS BETWEEN STRESS PHYSIOLOGY AND SUSTAINED ATTENTION ACROSS INFANCY**

Annie Brandes-Aitken, B.S., Stephen Braren, B.S., Sarah Vogel, B.S., Rosemarie Perry, PhD, Clancy Blair, PhD, Applied Psychology, New York University, New York, NY

The attentional control system and neuroendocrine stress system are two interrelated neurobiological systems that support self-regulation. While moderate activation of the hypothalamic-pituitary-adrenal (HPA) axis can promote attentional abilities, prolonged exposure to physiological stress can lead to allostatic load which is thought to disrupt childhood cognitive development. Investigating associations between physiological stress, such as cortisol, and attention on the within-person level across multiple time points during early development may elucidate some of these complex relations. Here we used data from a large, longitudinal sample ($N=1,292$) of children and their families living in rural poverty. Using multi-level modeling we assessed within-person linkage between cortisol and sustained attention across 7, 15 and 24 months of age. Moreover, we tested whether the directionality of within-person relations between cortisol and attention differed for children who typically experienced particularly low or high levels of cortisol on average over time. Results first demonstrated that, between children, cortisol was negatively associated with attention from 7-24 months of age. Interestingly, while

there was no significant main effect of a within-person relation, a cross-level interaction demonstrated that the direction and the magnitude of the within-person relation was contingent on children's average levels of cortisol overtime. More specifically, increases in cortisol were associated with contemporaneous sustained attention decreases for children with typically elevated levels of cortisol. However, increases in cortisol levels were associated with increases in sustained attention for children with typically low levels of cortisol. These results suggest that the fluctuations in cortisol levels may differentially affect cognitive abilities depending on levels of allostatic load over time.

84) Abstract 1701

UNPREDICTABLE EARLY LIFE EXPERIENCES & ADOLESCENT ANHEDONIA AND DEPRESSION

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Background:

Exposure to early adversity is one of the strongest and most widely replicated determinants of subsequent mental illness. Nonetheless, the ability to predict individual vulnerability to mental illness remains limited. Recent evidence suggests that unpredictable early life experiences may contribute to our understanding of vulnerability to mental illness beyond typically studied risk factors including poverty, parenting, trauma and parental mental health. The purpose of this study was to evaluate whether exposure to unpredictable early life experiences is associated with adolescent mental health vulnerabilities focusing on depression and anhedonia.

Methods:

Participants included 129 adolescents (56% female) aged 12 - 17 years ($M = 14.6$, $SD = 1.3$). Adolescents completed the Questionnaire of Unpredictability In Childhood (QUIC). A semi-structured diagnostic interview, the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS), was conducted to assess anhedonia and major depressive disorder. Symptoms of adolescent anhedonic depression were additionally assessed using a dimensional self-report measure, the Mood and Anxiety Symptoms Questionnaire (MASQ). Other previously established measures of the childhood environment were also collected (income-to-needs ratio, stressful life events, and parenting).

Results:

Adolescents who experienced greater unpredictability during childhood were more likely to exhibit symptoms of anhedonia ($t(127) = -3.061$, $p < 0.001$) and depression ($t(127) = -4.706$, $p < 0.001$) on the K-SADS. Similarly, adolescents who experienced more childhood unpredictability also reported higher levels of anhedonic depression on the MASQ ($r = .353$, $p < .001$). These findings remain significant even after adjusting for previously established measures of the childhood environment (income-to-needs ratio, stressful life events, household chaos, and parenting).

Conclusions:

Unpredictable early experiences predict adolescent depression and anhedonia assessed both with the diagnostic interview and dimensional self-report. Importantly, we also found that unpredictable experiences are associated with symptoms of depression and anhedonia beyond previously established measures of the childhood environment. These findings provide support for our hypothesis that childhood exposure to unpredictable experiences contributes to later mental health vulnerabilities.

85) Abstract 1396

EMOTIONAL AND PHYSIOLOGICAL CONSEQUENCES OF EMOTION EXPRESSION DURING ANGER INDUCTION IN TYPE D PERSONALITY

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Background: Type D personality (the interaction between social inhibition and negative affectivity) is characterized by suppression of emotional expression. Emotion expression/suppression may affect emotional experience and physiological recovery after stress. The role of Type D personality as a moderator of this process is unknown. We therefore aimed to investigate how emotional expression during anger recall relates to post-stress emotional experience and physiological recovery, and how Type D personality affects these relations.

Methods: 114 undergraduate students and 27 adults of the general population completed the DS14 and participated in the Anger Recall task, while cBP was recorded. FaceReader software gauged continuous emotional expression. Negative and positive emotions were assessed before and after the Anger Recall task. Analyses were performed using ANOVA and Pearson correlations.

Findings: Type D individuals experienced significantly less low arousal positive emotions than non-Type Ds during resting baseline ($F = 5.22$, $p = .024$); no baseline differences were observed in emotional expressions. Neutral and sadness expression during anger recall were associated with experiencing more low arousal negative emotions during recovery only in Type D individuals ($r_{\text{neutral}} = .36$, $p = .027$; $r_{\text{sad}} = .36$, $p = .030$). In Type Ds, the expression of anger and contempt during stress was associated with experiencing more positive emotion afterwards ($r_{\text{anger-joy}} = .45$, $p < .01$; $r_{\text{contempt-happy}} = .37$, $p < .05$). No associations were found between emotional expression during anger recall and blood pressure recovery.

Discussion: Results suggest that non-expression of emotion during anger recall increases negative emotional experience in Type Ds, while the expression of anger and contempt may benefit Type D individuals in increasing positive emotional experiences during recovery.

86) Abstract 1416

PROBLEMS WITH EXECUTIVE FUNCTIONING AND LINKS WITH COPING STRATEGIES DURING BREAST CANCER SURVIVORSHIP

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Background: Approximately 50% of breast cancer survivors endorse cognitive problems following diagnosis and oncologic treatments. These cognitive difficulties are challenging in their own right and may also impede women's ability to navigate emotional challenges experienced during survivorship. Specifically, we hypothesized that problems with higher-order cognitive processes, or executive functions (EFs), would interfere with approach-oriented coping and instead promote disengagement-based coping, which may require fewer cognitive resources. Here, we tested links between EF and coping in a longitudinal study of breast cancer survivors. **Methods:** Study participants included 171 women with early stage breast cancer who participated in a longitudinal study examining the effects of adjuvant endocrine therapy on cognitive functioning (the Mind-Body Study). Participants completed objective (neuropsychological tests: Trails B, Stroop, Letter-Number Sequencing) and subjective (Patient's Assessment of Own Functioning Inventory – Higher-Level Cognition) measures of EF 6 months and 1 year following primary treatment completion. Cancer-related coping was assessed at the 1-year post-treatment visit with the COPE. **Results:** As predicted, at 1-year post-treatment, both objective and subjective measures of EF were correlated with disengagement-based coping, such that those with poorer EF performance and more EF complaints were more likely to endorse behavioral disengagement in particular ($ps < .05$). However, there was not a significant association between EF and approach-

oriented coping. In longitudinal analyses, poorer EF performance and more EF complaints at 6 months were associated with behavioral disengagement at 1 year ($ps < .05$). These findings were significant in models controlling for biobehavioral confounds (age, IQ, fatigue, history of chemotherapy, and receipt of endocrine therapy). **Conclusions:** The present study identified associations between EF and behavioral disengagement coping in breast cancer survivors, which may have implications for depression in this population. Thus, findings from this study identify potential cognitive and affective targets for intervention to promote psychological adjustment during breast cancer survivorship.

87) Abstract 1461

THE MEDIATION OF DISTRESS-INDUCED EATING BY POSITIVE AND NEGATIVE COPING STRATEGIES

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Introduction: Psychological distress is thought to stimulate eating in overweight and obese persons who restrict their caloric intake (restrained eaters) and/or who are sensitive to emotional and sensory triggers (uncontrolled eaters). The impact of distress on these factors may be influenced by coping strategies. Previously, we have examined distress, conceptualized as hostile negative affect (HNA) and perceived stress (PS), and found that greater HNA is related to greater PS, which in turn is related to greater restrained and uncontrolled eating. This study examined whether positive and negative coping strategies mediate the association of distress with these eating styles, independent of age, sex, and central adiposity.

Methods: The 143 healthy adults (35% women, 18-55 yrs) had no prior cardiometabolic or psychiatric conditions. The analyses used structural equation modeling, controlling for age, sex and waist girth. HNA was a second-order factor indexed by Hostility, using the Cook-Medley hostility subscales, and Negative Affect, using the Profile of Mood States depression, anxiety, and anger subscales. PS was derived from the Perceived Stress Scale total score. Coping was indexed by the 12 Brief COPE subscales. Restrained (RES) and Uncontrolled (UNC) eating scores were derived from subscales of the Dutch Eating Behavior Questionnaire, Three-Factor Eating Questionnaire, and Restraint Scale.

Results: The path from HNA to PS was significant ($\beta=.53$, $p<.001$). PS was positively related with denial coping ($\beta=.24$, $p=.004$) and behavioral disengagement ($\beta=.17$, $p=.04$), but was negatively related with positivity ($\beta= -.22$, $p=.01$), planning ($\beta= -.17$, $p=.04$), and acceptance ($\beta= -.17$, $p=.04$). Notably, of these coping strategies, only denial was associated with RES ($\beta=.30$, $p=.002$) and UNC ($\beta=.17$, $p=.01$) eating. The final model had good fit ($\chi^2=203.4$, $p=.06$, CFI=.97, RMSEA=.04). In sum, distress predicted increased negative coping and decreased positive coping. However, only denial coping mediated the pathway from distress to eating styles, wherein 8.7% of the variance was explained in RES and 19.0% in UNC.

Conclusion: Psychological distress is linked to increased denial coping, which in turn is linked to greater restrained and uncontrolled eating. Therefore, denial coping in persons with elevated distress may be a potential behavioral target in obesity interventions.

88) Abstract 1508

DEMOGRAPHIC PREDICTORS OF ADULT BEHAVIORS IN THE PEDIATRIC POSTOPERATIVE ENVIRONMENT

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Over 85% of children experience postoperative pain. If poorly treated, pediatric postoperative pain may lead to various negative health outcomes such as increased anxiety, increased analgesic consumption, and maladaptive behavioral changes. Adult behaviors may be associated with child experiences in the postoperative environment. For example, adult behaviors such as distraction, humor, and coping advice divert a child's attention away from their pain and thus, may significantly reduce child postoperative distress. In contrast, adult behaviors such as empathy, reassurance, and apology direct a child's attention towards their pain which may increase a child's overall postoperative distress. Given some behaviors have been shown to be beneficial for pain while others have shown to be detrimental, it is important to uncover the predictors of adult use of these behaviors. For example, patient demographic factors, like child ethnicity, may significantly alter the frequency of use of these adult behaviors. Therefore, this study aimed to determine which participant demographic factors are associated with the use of certain adult behaviors in response to child postoperative distress. This study included children ages 2 to 10 years old ($N=112$) undergoing elective surgery at the Children's Hospital of Orange County. Participant demographics including ethnicity and race were collected prior to surgery. Nurse, parent, and child postoperative behavioral interactions were video recorded in the Post Anesthesia Care Unit (PACU). From these video recordings, adult behaviors (distraction, humor, coping advice, empathy, reassurance, and apology) were coded for their frequency of use. Multiple regressions analyses showed that adults were more likely to use humor with Non-Hispanic White children compared to Hispanic children ($b = 0.393$, $p = 0.049$). Moreover, fathers were marginally more likely to use empathy, reassurance, and apology with Hispanic children compared to Non-Hispanic White children ($b = 0.249$, $p = 0.05$). These results suggest that Hispanic and Non-Hispanic White children may receive different behavioral treatment in response to their postoperative distress. Implications for these findings suggest that child ethnicity may be predictive of different adult PACU behaviors which may illustrate how cultural differences can influence the child postoperative experience.

89) Abstract 1033

EMOTION REGULATION AND RESTING VAGAL ACTIVITY IN HEALTHY ADULTS

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Objective: Numerous studies have suggested that vagus nerve activity, often measured as high frequency heart rate variability (HF-HRV), serves as a readout of the capacity for emotion regulation. However, most studies have small sample sizes and/or narrow and unrepresentative samples. The present study aimed to test associations between HF-HRV and emotion regulation – measured as self-reported use of reappraisal and suppression – in data from MIDUS, a comprehensive national study of the role of behavior, psychological, and social factors in age-related health and well-being. **Method:** Measures of HF-HRV during 11-min of quiet seated rest and the full Emotion Regulation Questionnaire (ERQ) were available in 224 men and women. In 1809 participants, HF-HRV and a brief version of the ERQ were available. Trait reappraisal and suppression were tested as predictors of HF-HRV in hierarchical regression models. Covariates included demographic and behavioral, and clinical variables.

Results: In univariate models for the full ERQ, HF-HRV was marginally associated with trait reappraisal ($\text{Exp}(b) (1,224) = 1.164$ [0.973,1.394], $p = 0.10$) but not suppression ($\text{Exp}(b) (1,224) = 0.988$ [0.864,1.130], $p = 0.86$) from the full ERQ. After adjustment for all

covariates, the association of HF-HRV and trait appraisal remained only marginally significant ($\text{Exp}(b) (1, 216) = 1.158 [0.971, 1.382], p = 0.10$) and the association with suppression remained nonsignificant ($\text{Exp}(b) (1, 216) = 0.987 [0.866, 1.125], p = 0.84$).

In univariate models for the brief ERQ, HF-HRV was not significantly associated with either the trait reappraisal ($\text{Exp}(b) (1, 1807) = 1.024 [0.969, 1.083], p = 0.39$) or suppression ($\text{Exp}(b) (1, 1807) = 1.023 [0.979, 1.070], p = 0.31$) index from the brief ERQ. After adjustment for all covariates, the association of HF-HRV and the brief reappraisal index remained nonsignificant ($\text{Exp}(b) (1, 1796) = 1.017 [0.965, 1.072], p = 0.52$) as did the association with the brief suppression index ($\text{Exp}(b) (1, 1796) = 1.028 [0.986, 1.073], p = 0.20$).

Conclusions: In this study with a large and diverse sample, emotion regulation, measured as self-reported use of reappraisal and suppression, was unrelated to cardiac vagal control. These findings contrast with those from studies with samples smaller in size and narrower in sociodemographic characteristics.

90) Abstract 1439

DOES PROBLEM-FOCUSED COPING MODERATE THE ASSOCIATION BETWEEN RESTING HRV AND DEPRESSION AMONG BLACK AMERICANS?

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Research has shown that Black Americans exhibit higher resting heart rate variability (HRV), an index of parasympathetic cardiac control, than White Americans. Individual differences in resting HRV have been argued to partially reflect greater inhibitory control and the use of active, problem-focused coping strategies (Appelhans & Luecken, 2006). Research further suggest that Black Americans may utilize restrained coping strategies in the face of unfair treatment (Dorr et al., 2007); with some findings that Black Americans are more likely to use these styles of coping than White Americans (Plummer & Slane, 1996). In the present study, we investigated the moderating role of restraint, a problem-focused coping strategy characterized by purposeful behavioral inhibition, on the relationship between resting HRV and depressive symptoms in a sample of Black emerging adults ($N = 192$, Mean Age = 20.97, 69% female). HRV was collected during a 5-minute baseline and depressive symptoms were assessed using the Depression, Anxiety & Stress Scales (DASS-21). Controlling for BMI and age, lower resting HRV marginally predicted greater depressive symptoms ($B = -.109, SE = .06, p = .09$); however, there was a trend toward an interaction for restraint coping ($B = .011, SE = .06, p = .086$). At lower levels of restraint, resting HRV was inversely associated with depressive symptoms ($B = -.069, SE = .04, p = .11$). Intriguingly, at higher levels of restraint coping, baseline HRV was positively related to depressive symptoms ($B = .061, SE = .04, p = .11$). These novel findings further illustrate that restrained coping may undermine the potential psychophysiological benefits of higher resting HRV previously observed among Black Americans.

91) Abstract 1153

KEEPING ACTIVE RESIDENTIAL ELDERLY (KARE): PRELIMINARY FINDINGS OF A FEASIBILITY STUDY OF AN ADAPTED PHYSICAL ACTIVITY INTERVENTION TO IMPROVE MULTI-DIMENSIONAL HEALTH IN FRAIL OLDER ADULTS IN RESIDENTIAL CARE

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Background: Frailty is a common and clinically significant multi-dimensional syndrome associated with adverse health outcomes such

as hospitalisation, disability and mortality among older adults. Physical activity interventions have been shown to be a beneficial treatment for frailty. However, studies are needed to assess the feasibility and impact of interventions in frail geriatric populations in different settings, with regard to multi-dimensional health and wellbeing.

Aims: This study assessed the feasibility and impact of a specially adapted resistance training intervention; aimed at improving the multi-dimensional health and functional capacity of frail geriatric care home residents.

Participants and Methods: Eleven older adults (aged ≥ 65 years) were randomised into the intervention or wait-list control group. The intervention was a 6-week resistance training protocol for 30 mins 3 times per week using specialised machines installed in the care home. Mixed methods were used to assess the feasibility and acceptability of the intervention and research measures, and conduct limited efficacy testing of the secondary outcomes. Feasibility was measured through adherence statistics, and focus groups with staff and interviews with participants. Intention to treat analyses examined the change pre- to post-intervention in key physiological, psychosocial, cognitive, immunological, and functional measures.

Results: six participants were randomised to the intervention group, one withdrew and there was 98.9% adherence in the remaining group. Thematic analysis of the qualitative data is ongoing but participants found the intervention and measures acceptable. Mean differences showed that the intervention group improved their walking speed, overall Fried Frailty score and leg curl and extensor strength. Psychosocial variables (stress, depression, anxiety, social support), cognition, Activities of Daily Living, and inflammatory cytokine levels did not change.

Conclusion: The initial findings support the feasibility and impact of a strength training intervention with high adherence and positive trends identified for frailty and physical function. Further research may help inform practical initiatives for muscle strengthening activities in alignment with updated Physical Activity Guidelines to improve frailty among older adults in residential care settings.

92) Abstract 1848

INVESTIGATING THE EFFECT OF FATIGUE ON HPA AXIS FUNCTIONING IN CHRONICALLY STRESSED INDIVIDUALS

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Background: Individuals suffering from chronic fatigue have been found to experience significantly more stress compared to healthy individuals. However, not everyone experiencing chronic levels of stress becomes fatigued, indicating that inherent individual differences exist in stress sensitivity, and risk for fatigue. While both chronically stressed and fatigued patients show hypoactivity of the hypothalamic-pituitary- adrenal (HPA) axis, it is not known whether differential patterns of HPA axis dysfunction exist in chronically stressed individuals with varying levels of fatigue.

Methods: 61 chronically stressed (CS; 38.31 ± 14 years) and 55 low-stress (LS; 37.90 ± 14.37 years) women, were exposed to a psychosocial laboratory stressor. Salivary cortisol measures were assessed throughout the study. Fatigue was assessed using the Multidimensional Fatigue Inventory.

Results: The results revealed that CS had overall significantly lower cortisol levels and higher fatigue, compared to LS ($ps < .05$). Within the CS group, increasing levels of fatigue were not associated with changes in cortisol. In the LS group, however, there was an inverse relationship between fatigue and cortisol, with increasing levels of fatigue associated with lower cortisol ($p < .05$).

Conclusion: Our findings indicate that in CS, stress-related hypoactivity of the HPA axis may have resulted in a floor effect for

cortisol, such that increasing levels of fatigue, in addition to existing chronic stress, do not have cumulative effects on the already blunted HPA axis. This was in contrast to the LS group in which fatigue had important effects on the HPA axis functioning, such that decreases in cortisol were observed as fatigue levels increased.

93) Abstract 1654

TRAIT ANGER AND PERCEIVED STRESS DIFFERENTIALLY EXPLAIN THE RELATIONSHIP BETWEEN DISCRIMINATION AND CHRONIC HEALTH BURDEN BASED ON RACE

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Background: Examining health disparities via a sociocultural lens draws attention to the roles of discrimination and minority status in health disparities. One approach Blacks use to cope with discrimination is through anger and findings regarding the influence of anger as a trait or behavioral expression on health outcomes are mixed. Therefore, we examined the influence of anger on the link between daily discrimination and perceived stress and then investigated whether trait anger and perceived stress explained the link between daily discrimination and chronic health.

Method: Using data from MIDUS (n=1,219) biomarker study (35-83 years, 56.8% females, 19% Blacks), PROCESS SPSS macro model 7 was used to investigate the moderated mediation analysis, controlling for age and sex. Analyses were replicated by race and further analyses were conducted to understand racial differences in the relationship between discrimination and chronic health.

Results: In the overall sample, trait anger, but not anger expression, significantly moderated the relationship between discrimination and perceived stress, and perceived stress partially explained the link between discrimination and prevalence of chronic health conditions and symptoms. Specifically, perceived stress explained more of the relationship between discrimination and chronic health for those with lower trait anger. Further analyses showed that trait anger did not moderate the association between daily discrimination and perceived stress for Whites, but did for Blacks. For Blacks with lower trait anger, as discrimination increased, perceived stress increased. In addition, for Blacks not Whites, trait anger directly moderated the relationship between discrimination and chronic health. Specifically, for Blacks with higher trait anger, greater discrimination was linked with poorer chronic health.

Conclusion: Trait anger and perceived stress appear to differentially affect the link between daily discrimination and chronic health based on race. For Blacks, anger regulation may be a target of intervention for clinicians serving those who report experiencing discrimination with higher trait anger, while for Whites, intervention should address global perceived stress. Taken together, these results highlight the need to develop racially-sensitive behavioral approaches to reduce chronic health burden.

94) Abstract 1673

CONNECTING TO CHILD PROTECTIVE SERVICES ON MEDICAL CHILD ABUSE: A REVIEW OF 50 STATES' WEBSITES

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Among the most neglected topics at the interface of psychology and medicine is medical deception. Medical Child Abuse (MCA) is a form of child maltreatment in which a caregiver exaggerates, feigns, or induces illness or injury in a child, resulting in unnecessary, and often harmful, medical procedures (Roesler & Jenny, 2008, p. 1). MCA is often described as Factitious Disorder Imposed on Another, Pediatric Condition Falsification, or Munchausen Syndrome by Proxy. MCA is well-documented in the child abuse literature and pediatric medical

specialty journals. However, there is considerable controversy and confusion surrounding medical child abuse among the wide range of mandated abuse reporters. For this reason, it is crucial that child protection agencies provide resources to improve awareness and appropriate reporting of this pernicious form of child abuse.

The present study sought to examine state resources on reporting child abuse and the degree to which state websites promote awareness of MCA. The official government websites of each of the 50 United States were surveyed and data on each state's definitions of child abuse was gathered. A search of a number of keywords typically associated with MCA was also undertaken to further explore the extent to which each state's child protection website reflects awareness and documentation of MCA.

Analyses revealed that none of the 50 states mention MCA as a separate category of abuse (outside of physical, emotional/psychological, and sexual abuse, and neglect). Only 3/50 states (6%) mention MCA in their definitions of child abuse at all. Two of those 3 states categorize MCA within the context of physical abuse, while the third state fails to categorize MCA within any of the four standard forms of child abuse. Instead, the third state provides an uncategorized list consisting of all the actions and omissions which constitute child abuse, including a description of MCA. The poor coverage of MCA information on state child protection websites represents a missed opportunity to raising awareness of it, which could promote early detection and intervention among voluntary and mandated reporters.

95) Abstract 1775

CULTURAL ASSOCIATIONS WITH PEDIATRIC ONCOLOGY PAIN

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Objective: Pediatric cancer patients frequently experience pain throughout treatment. Each patient interprets their pain and discomfort distinctively, and also conveys their reactions in various manners. The cold pressor task (CPT) is a common method used to induce experimental pain in pediatric populations to examine factors that may impact pain response. This study was designed to examine the role of culture in the pain response of children undergoing treatment for cancer using the CPT.

Methods: A sample of 72 children ages 6-18 years receiving treatment for cancer participated in the current study. Of the 72 children, 45 reported a primary language of English at home and 27 reported Spanish as the primary language at home. Children completed the CPT and provided self-report ratings of their pain and upset severity at 30 second intervals throughout the task. Ratings were obtained using a 0-10 numeric rating scale; analysis was conducted with ratings obtained when children removed their hand from the cold water. Independent samples t-tests were used to examine differences in children's ratings of pain and upset as function of primary language spoken at home.

Results: Participants were 11.67 years of age ($SD=3.79$), mostly boys (61.6%), and primarily diagnosed with leukemias (57%). Comparison of mean upset and pain ratings revealed significant differences between groups. Specifically, Spanish-speaking children reported significantly higher upset scores (5.04 ± 3.72) compared to English-speaking children (1.93 ± 3.31), $t(70) = -3.68, p < 0.001$. In addition, Spanish-speaking children also reported significant higher pain scores (6.56 ± 3.22) compared to English-speaking children (4.44 ± 3.67), $t(70) = -2.47, p = 0.013$.

Conclusion: Under the conditions of this study, we found that children whose primary language at home was Spanish experienced greater pain and upset compared to children with primarily English-speaking families. Given literature that supports language as a proxy for acculturation, we can infer that cultural factors impact the pain response in children. Future research should examine the mechanisms behind this association to ensure culturally relevant pain interventions for children with cancer.

96) Abstract 1719**PAIN-RELATED ANXIETY PROMOTES PRO-NOICEPTIVE PROCESSES IN NATIVE AMERICANS**

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Epidemiological evidence suggests that Native Americans (NAs) experience higher rates of chronic pain than any other U.S. racial/ethnic group, but the mechanisms contributing to this pain disparity are poorly understood. Recently we conducted a large study of healthy, pain-free NAs (n=155) and non-Hispanic Whites (NHWs, n=150) to address this issue. We found little evidence that NAs and NHWs differ in pain processing assessed from multiple quantitative sensory tests (QST): No differences in spinal cord amplification processes (i.e., temporal summation, TS), endogenous pain modulation (i.e., conditioned pain modulation, CPM), and pain sensitivity measures (threshold/tolerance) were found. However, NAs reported higher levels of pain-related anxiety during painful tasks. The current study was an ancillary analysis of these data to address a novel issue: whether pain-related anxiety could promote pro-nociceptive processes in NAs that might put them at risk. Bootstrapped mediation analyses found that pain-related anxiety mediated the relationships between NA race and measures of pain tolerance (electric, heat, ischemia, cold pressor) and conditioned pain modulation (CPM) of the nociceptive flexion reflex (NFR). Exploratory analyses failed to find that race moderated relationships between pain-related anxiety and QST pain outcomes. These findings imply that pain-related anxiety is not a unique mechanism of pain risk for NAs, but that the greater tendency to experience pain-related anxiety by NAs impairs their ability to engage descending modulation of spinal nociception and decreases their pain tolerance (more so than NHWs). Thus, pain-related anxiety may promote pro-nociceptive processes in NAs that place them at risk for future chronic pain.

97) Abstract 1610**OPTIMIZING METHODS TO STUDY PAIN AMPLIFICATION USING TEMPORAL SUMMATION OF HEAT PAIN**

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Temporal summation (TS) of heat pain, the increase in pain report in response to a repeated train of same-intensity painful heat stimuli, is used to experimentally assess central sensitization (CS). CS refers to the amplification of pain signals in the spinal cord and is a process believed to contribute to chronification of pain. Unfortunately, the methods used to study TS of heat pain are not standardized, therefore contributing to inter-lab variability, discrepancies in findings, and confusion in the literature. Further, some methods do not reliably elicit TS of heat pain. The current study attempts to establish the best method to evoke TS of heat pain using a commercially available thermal stimulator (Medoc TSA-II; Haifa, Israel). 30 healthy, pain-free men (n=9, age M=23.67, SD=7.67) and women (n=21, age M=20.62, SD=2.38) completed testing that included 3 blocks of painful heat trains. Each block consisted of 24 trains and the trains within a block varied in: 1) pulse baseline temp (42, 43, 44°C), 2) pulse peak temp (48, 49, 50°C), 3) pulse ramp speed (6 vs. 8 °C/s), 4) peak temp duration (.5, .25s), and 5) site of stimulation (palmar hand vs. volar forearm). Participants were instructed to give pain ratings aloud in response to each pulse after they felt "second pain" (i.e., slow pain due to C-fiber activation). Ratings were made using a numerical rating scale ranging between 0 (no sensation) and 100 (intolerable pain). Summation was defined as the slope for the best fitting regression line through the 10 pain ratings of each pulse train. A multilevel ANOVA

revealed that only two heat trains, applied to the hand, successfully led to TS of heat pain (i.e., a positive slope). Most trains led to significant habituation (i.e., significant negative slopes). The first train started at a baseline temp of 44°C, ramped up and down at 6°C/s, and had a peak temp of 50°C with a 0.5s peak duration. The second train started at a baseline temp of 44°C, ramped up and down at 8°C/s, and had a peak temp of 50°C with a 0.5s peak duration. However, only the second train resulted in a positive slope that was significantly different from zero (p=.01). Therefore, only the second train led to significant TS of heat pain at the group level. This provides an initial step forward to establishing a standard for assessing central sensitization from TS-heat pain.

98) Abstract 1350**MATTERS OF THE HEART: RELATIONSHIP QUALITY, SELF-RATED HEALTH, AND LONGITUDINAL POSTPARTUM HEART RATE VARIABILITY**

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Background: Heart rate variability (HRV), the beat-to-beat variation in the duration of R-R intervals, is an indicator of autonomic function; higher resting HRV is associated with better mental and physical health. On average, HRV decreases with gestational age across pregnancy. To our knowledge, no study has described normative HRV trajectories postpartum, and what factors influence these trajectories. **Methods:** We utilized a longitudinal sample of 83 women with a singleton gestation. HRV was collected at five timepoints beginning at 29-34 weeks pregnant with visits until 12 months postpartum. For each HRV analysis, we conducted separate analyses using HRV time domain and frequency domain measures as dependent variables. Demographics and questionnaire data, including self-rated health and the Positive and Negative Qualities in Marriage Scale, were collected at Visit 1. **Results:** After controlling for key participant confounds, including age, body mass index, and income, we observed reliable increases in RMSSD and HF-HRV across each visit time point ($p < .001$). Participants' self-rated health was a useful predictor of this trajectory ($p_{rmssd} = .05$; $p_{HF-HRV} = .09$). Women who reported being in better health had higher HRV at each time point than those who reported being in poorer health; this difference was statistically significant at 4 months ($p_{rmssd} = .007$; $p_{HF-HRV} = .010$) and 8 months ($p_{rmssd} = .03$; $p_{HF-HRV} = .180$) postpartum. Similarly, women who evaluated their relationships as having fewer negative qualities also had higher HRV across each postpartum visit point than those who reported more negative qualities within their relationships ($p_{rmssd} = .08$; $p_{HF-HRV} = .028$); again, this effect was especially pronounced at 4 months ($p_{rmssd} = .002$; $p_{HF-HRV} = .001$), 8 months ($p_{rmssd} = .022$; $p_{HF-HRV} = .052$), and 12 months ($p_{rmssd} = .227$; $p_{HF-HRV} = .051$) postpartum. **Conclusions:** During the first year postpartum, women's HRV normatively increased. Women who reported lower self-rated health or poorer relationship quality did not exhibit the same level of increase at 4 and 8 months postpartum compared with those who reported better (a) self-rated health or (b) self-rated relationship quality. Differences in HRV in the first year postpartum may correspond to specific clinical endpoints, an important direction for future research.

99) Abstract 1823**THE EFFECTS OF A STRESS MANAGEMENT INTERVENTION ON REDUCING BIRTH COMPLICATIONS AND THE MODERATING ROLE OF PRENATAL MATERNAL ALPHA AMYLASE**

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Previous research has associated elevated maternal stress levels and alpha amylase with heightened risk for birth complications. However,

few studies have examined the impact of cognitive behavioral stress management interventions on reducing the risk of birth complications in at risk communities. The current study examined whether low-income mothers randomized to a cognitive behavioral stress management (CBSM) intervention during pregnancy (n=55) had infants with less birth complications compared to an attention control (AC) group (n=45) and whether these outcomes were influenced by mothers' level of alpha amylase levels during the second trimester. The women were randomized to either an eight-week CBSM intervention where they were taught coping and relaxation skills to manage stress, or an AC group where they received printed materials on prenatal health information over the same eight-week period. Saliva samples were taken at 8 weeks in order to assay for their alpha amylase levels. Regression analyses revealed that infants of mothers randomized to the CBSM group had less total birth complications compared to infants of mothers in the AC group, however, this was only true for women with low levels of alpha amylase ($R^2 = .17$, $b = .13$, $p = .005$). There were no intervention effects found for women with high levels of alpha amylase. These results suggest that prenatal CBSM interventions are potentially effective in reducing the number of total birth complications and highlight the importance of implementing such programs in low income communities. More research needs to be conducted in order to find effective interventions for low income mothers with high levels of alpha amylase.

100) Abstract 1905

MATERNAL MINDFULNESS TRAINING DURING PREGNANCY HAS POSITIVE EFFECT ON EXECUTIVE ABILITIES OF CHILDREN

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Background: There is evidence that maternal anxiety and depression during pregnancy affects child outcomes. However, there is lack of studies that have evaluated the effects of maternal psychosocial factors during pregnancy on child neurocognitive outcomes. This study evaluates the effect of the maternal mindfulness training during pregnancy on development of executive abilities in 5-6 years old children.

Method: In the current study we included 19 women who participated in the maternal mindfulness training during pregnancy. The control group included 19 women who did not participate in this training during pregnancy. When the offspring of the target pregnancies were between 5 to 6 years of age, their executive abilities were assessed by 4 subtests from child neuropsychological assessment NEPSY (Tower, Auditory Attention and Response Set, Visual Attention, Statue).

Results: One-way ANOVA was used to reveal group differences in performing subtests. We have revealed the significant differences ($p < .05$) between groups in three subtests. The children from the experimental group performed better on Auditory Attention and Response Set, Visual Attention and Statue subtests.

Conclusion:

These results suggest that maternal mindfulness training during pregnancy may have positive effect on neurocognitive development of children, particularly on the development of executive abilities in preschool children. However, we need to do further research to understand the influence of maternal mindfulness training on neurocognitive development of children.

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101) Abstract 1132

MATERNAL FAMILISM IN MEXICAN-AMERICAN WOMEN AS A PREDICTOR OF FEAR IN PRESCHOOL-AGED CHILDREN

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Fear is one of the most common anxiety symptoms exhibited in children. Although fear is thought to decrease as children get older, it may also serve as a predictor for internalizing behavior problems such as anxiety later in life. Mexican-American children are the fastest growing demographic in the US, thus it is important to understand cultural factors might affect fear in this population. Familism, a Mexican-American culture value that promotes support, obedience, and obligation between family members, has been shown to buffer the adverse effects of mental health disorders on wellbeing in adults and promote positive parenting. However, if familism is related to fear behavior in childhood is not clear. Thus, this study tested the hypothesis that more maternal familism would be associated with higher levels of fear in their children. The participants consisted of 67 Mexican-American women and their preschool aged children. Mothers completed the Mexican American Cultural Values Scale (MACVS) during pregnancy to assess for familism and the Preschool Age Psychiatric Assessment (PAPA) when the child was about 3.5 to 6 years of age to assess fear. Results indicated that higher levels of familism was associated with higher levels of fear in preschool aged children ($R^2 = .067$, $B = 1.972$, $SE = .910$, $t = 2.168$, $p = .034$), suggesting that high familism values could be a risk factor for children's well-being. Familism is complex and recent work has suggested that the role of familism could even be a stressor depending on the family economic situations and obligations. Further research should investigate the role of familism across different situations to obtain a better understanding of its advantages and disadvantages.

102) Abstract 1711

THE EFFECTIVENESS OF PRENATAL STRESS MANAGEMENT INTERVENTIONS IN REGULATING POSTPARTUM CORTISOL LEVELS AS MODERATED BY LEVEL OF PRENATAL DEPRESSION

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Elevated cortisol levels during the early postpartum period have been associated with several adverse health outcomes for mothers and their children, particularly among mothers experiencing depressive symptoms. Yet, few studies have examined whether prenatal stress management interventions are effective in reducing mothers' postpartum cortisol levels and whether these intervention effects vary by their level of prenatal depression. The current study examined whether participation in a prenatal cognitive behavioral stress management (CBSM) program was associated with lower cortisol levels at three months postpartum and whether this relationship varied by level of prenatal depression. Our sample consisted of 78 low-income mothers (mean age=25+5 years; 71% Latina; 76% annual income < 20k) who were randomized to either an eight-week, group-based CBSM program or a control group during their first trimester of pregnancy. Prior to randomization, participants completed a depression questionnaire (EPDS), and provided seven saliva samples on one collection day to assess cortisol (AUC). At three months postpartum, mothers' salivary cortisol levels were reassessed. Regression analyses revealed no significant group differences between mothers randomized to CBSM or the control group on cortisol levels at three months postpartum ($\beta = -.608$, $p = .642$), controlling for baseline cortisol. Additionally, intervention effects on postpartum cortisol did not vary by level of prenatal depression ($p = .2573$). Future studies may want to test additional factors that may influence intervention effects on the cortisol levels of low-income mothers.

103) Abstract 1611

RELATIONSHIP BETWEEN SELF-REPORTED STRESS AND ACUTE STRESS REACTIVITY: EVIDENCE FROM THE RICHMOND STRESS AND SUGAR STUDY

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Background: Stress biomarkers and subjective stress reports may measure distinct but overlapping constructs of stress exposure; however, the exact relationship between these measures is not fully understood. We examine whether self-reported stress is associated with levels of salivary cortisol through the course of an acute stress response.

Method: Data come from the Richmond Stress and Sugar Study, a longitudinal cohort of adults at risk of type II diabetes (age 40-70 y.o.), recruited from primary care in Richmond, VA. Acute stress was induced via Trier Social Stress Test (TSST). Over the course of 3 hours, total 8 salivary samples were collected from 125 participants. Subjective stress was measured using two validated surveys administered during a one-hour psychosocial interview: 1) the 10-item Perceived Stress Scale (PSS) and 2) the 54-item Chronic Stress Scale (CSS) across 12 life domains. We used growth curve models adjusted for race, sex, age, socioeconomic status, employment status and smoking to estimate the association between cortisol and self-reported stress. Cortisol was modeled using linear regression splines to capture the ascending and descending slopes of the cortisol stress response. Summed PSS and CSS scores were examined separately using continuous and categorical form.

Results: In the adjusted analyses, baseline cortisol values did not differ significantly across tertiles of perceived or chronic stress scales. However, respondents in the highest tertile of PSS had a 1% ($p=0.03$) slower activation rate, but 1% ($p=0.02$) sharper decrease in cortisol levels compared to respondents in the lowest stress tertiles. Similarly, a standard deviation increase in PSS scores was associated with a 0.4% ($p=0.03$) slower cortisol increase and 1% ($p=0.02$) steeper regulation curve. The associations with chronic stress scores were in the same general directions, but none achieved significance at 0.05.

Conclusion: Preliminary findings suggest that among participants at risk for developing type II diabetes, individual reports of perceived, but not chronic stress, might offer insight about acute stress reactivity. Implications for population research are discussed.

104) Abstract 1872

DISTRESS TOLERANCE AND CARDIOVASCULAR REACTIVITY DURING A COMFORT INTERACTION

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The ability to cope effectively with stress varies considerably from person to person and reveals inter-individual differences in distress tolerance (DT). DT has implications not only for how individuals psychologically manage stress, but also for how one physiologically manages stress via the autonomic response. The purpose of this study was to analyze the relation between DT and cardiovascular reactivity to an interpersonal stressor in a sample of female undergraduate students at West Virginia University. It was hypothesized that women with a lower distress tolerance score (DTS) (i.e., those who have a harder time handling stress) would be more physiologically reactive than those with a higher DTS during an in vivo interaction task between a participant and a confederate. In addition to the cardiovascular reactivity measures of heart rate (HR), blood pressure (BP), and heart rate variability (HRV), measures of affective reactivity, interpersonal goals, task appraisals, and verbal and nonverbal behaviors were obtained. Separate two-step hierarchical regression analyses were conducted with DTS as the predictor variable and each measure as an outcome variable, controlling for baseline measures in the first step. Results revealed that DTS significantly predicted high frequency heart rate HRV to the comfort task, $R^2\Delta = .040$, $F(1, 29) = 4.508$, $\beta = .202$, $p = .042$, such that higher levels of

DT were associated with increased HF-HRV (increased parasympathetic activity) response to the task. Regression analyses predicting measures of affect from DTS indicated that those with higher levels of DT experienced reduced negative affect during task completion, $R^2\Delta = .131$, $F(1, 29) = 7.041$, $\beta = -.371$, $p = .013$. Finally, regressions on several task appraisal items revealed that those with higher levels of DT perceived the task as being less stressful, were less upset by their task performance, and felt that the task was less difficult, as compared to those with lower DT. Additionally, DT was associated with an increased positive affective and decreased negative affective response to the comfort task. This study adds to the literature that has examined the association between DT and autonomic reactivity and may elucidate our understanding of how underlying physiological mechanisms are related or contribute to stress management and coping behaviors.

105) Abstract 1495

TRACKING SUBJECTIVE AND PHYSIOLOGICAL EMOTION IN DAILY LIFE

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Wearable body sensors are groundbreaking in that they allow for continuous and unobtrusive physiological measurements. The promise is that someday soon, wearable devices will monitor our bodily state and thus will provide data to potentially improve our wellbeing: detecting acute physiological events like heart attack; detecting the onset of serious illness, and monitoring everyday psychological experiences such as stress. But this is not yet a plug and play matter; simply attaching a heart rate sensor does not fulfill this dream.

Physiological data is complex, and the scientific validation of continuous real-life physiological measurements is still scarce. There's a lot to be learned about how physiological markers can be used to inform us about underlying physiological and psychological processes. The present study aims to do just that, by testing whether heart rate variability (HRV) recorded with a wearable sensor can be used as a marker of one's emotional experiences.

We will report data from a study in progress in which 10 college students tracked their physiological and subjective states for a week. **To track subjective experience**, participants were prompted 4 times a day to rate their emotional experience on 6 scales (2 positive), and their physical wellbeing on 2 scales. **HRV** was monitored with a commercially available wrist-worn photoplethysmography sensor, which participants were asked to wear throughout day and night.

One analysis will summarize the reliability of HRV measurement. We are specifically interested in the following parameters: average and range of HRV during the day and at night. A second analysis based on structural equation modelling will test the fit between those measures of HRV that are reliable, on the one hand, and subjectively experienced emotion, on the other.

This study represents a first step in testing whether wearable HRV sensors can be used as indicators of subjective emotional experience outside of the lab. We hope to report on those parameters of HRV that can be reliably measured. This will lay the groundwork for assessing the fit between HRV and subjectively experienced emotions in daily life, allowing us to answer such questions as: What is the range of individual variability in the coherence of HRV and self-reported mood? Is there a link between overall wellbeing and the degree to which HRV and mood cohere?

106) Abstract 1742**ACCOUNTING FOR SEX HORMONAL CONTRACEPTIVES AND TIME OF DAY IN PSYCHOSOMATIC MEDICAL RESEARCH: DATA FROM THE FAMILY HEALTH PATTERNS STUDY**

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Objective:

The Family Health Patterns project (FHP) seeks to identify biological and temperament characteristics that may affect risk for substance use disorders. FHP has gathered a large data set for predictors of cortisol stress reactivity including physiological, psychological, cognitive, and behavioral characteristics thought to be relevant to behavior and addiction. Consistent with the literature FHP project found that women have smaller cortisol responses to psychological stress than men. We sought to understand how hormonal contraceptives influenced cortisol reactivity to stress in relation to time of day.

Methods:

Cortisol Stress reactivity was measured on 708 healthy young adults, [Men =315; Women Hormonal Contraceptives (HC)+ = 139; Women HC- = 254] exposed to public speaking and mental arithmetic stressors in the laboratory. Reactivity represented the saliva cortisol change from rest-day to stress-day samples collected during the time period of the stress protocol. The analysis used a general linear model including hormonal contraceptive group, time of day of testing and the HC X Time interaction, followed by Tukey-Kramer post hoc tests.

Results:

The general linear model predicted cortisol reactivity using HC and time of day. A significant interaction was found for HC+ women and time of day ($F = 5.65, p\text{-value} = 0.018$). HC+ women demonstrated an absence of stress response in the morning and a normal level of response in the afternoon. Whereas men and HC- women had a larger response in the morning and a smaller response in the afternoon.

Conclusion:

Cortisol reactivity was found to be influenced by hormonal contraceptive use and time of day. Cortisol stress responses in HC+ women are absent in the morning and normalize by early afternoon. These findings suggest important methodological considerations when studying stress reactivity, specifically the need to account for time of day when evaluating cortisol responses in women using hormonal contraceptives. Methodological considerations such as the importance of collecting HC use, including a resting data, as well as controlling for other possible covariates will be highlighted. Additional research on the influence of the phase of menstrual cycle on cortisol stress reactivity is a potential avenue for future research.

107) Abstract 1758**INFLEXIBLE AUTONOMIC RESPONSES TO SADNESS ARE ASSOCIATED WITH COGNITIVE AND COPING INFLEXIBILITY**

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Background: Maladaptive coping strategies have been identified as risk factors for experiencing depression. Prior work has shown that individuals with poor mental health exhibited inability to flexibly engage in thoughts that fit the demands of stressful situations. Moreover, respiratory sinus arrhythmia (RSA) has been identified as a physiological index of flexible emotion regulation. However, despite the proposal of theories linking multiple aspects of flexibility (Stange, Alloy, & Fresco, 2017), there is a lack of evidence indicating whether difficulties in thinking and coping flexibly are also related to inflexible autonomic responses to sadness. To address this

gap in knowledge, the current study examined the associations between participants' changes in RSA in response to a sad film and their cognitive and coping inflexibility.

Method: 178 college students completed the Coping Flexibility Scale (Kato, 2012), which measures the ability to switch from ineffective coping to alternative strategies. They also completed Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010); its alternatives subscale reflects one's ability to generate alternative solutions and explanations to difficult situations. Changes in RSA values were computed from Electrocardiogram and respiration data collected before and during viewing a sad film; higher change scores represent more autonomic flexibility (more contextually-appropriate responses to sadness).

Results: Autonomic inflexibility was associated with lower levels of evaluation coping ($r = -.19, p = .01$) and adaptive coping ($r = -.16, p = .04$), as well as lower scores on the CFI alternatives subscale ($r = -.15, p = .045$), but not with the control subscale ($r = .01, p = .91$), which measures the perceived controllability of difficult situations.

Discussion: Our findings show that aspects of cognitive and coping inflexibility are associated with autonomic inflexibility. Given the increasing attention in studying how individuals' physiological responses to real-life stressful events relates to risk for depression, it is vital to identify cognitive vulnerabilities that might contribute to maladaptive physiological changes in response to stress. Ultimately, our findings may help in developing a theoretical framework that integrates cognitive and physiological components of maladaptive emotion regulation.

108) Abstract 1094 will not be published**109) Abstract 1418****SOCIAL CONTAGION OF VASOVAGAL SYMPTOMS IN BLOOD DONORS**

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Objective: Vasovagal reactions (VVR) are commonly experienced in medical situations such as blood donation. Many clinicians believe that psychosocial contagion can contribute to VVR, but this is largely clinical lore; little research has studied this phenomenon in a systematic way. The goal of the present investigation was to examine the physiological effects of observing another experience a reaction, focusing on the potential moderating effects of empathy.

Methods: This study was part of a randomized controlled trial examining the effects of behavioral techniques on the prevention of VVR in blood donors. The sample was composed of 530 healthy university students. Measures of symptoms were obtained by self-report with the Blood Donation Reactions Inventory (BDRI) and through observation. Physiological variables were measured using respiratory capnometry and a digital blood pressure monitor. The Affective and Cognitive Measure of Empathy was administered to 230 participants. Three empathy subscores were obtained: cognitive empathy, affective resonance and affective dissonance (which was reverse-scored, such that higher scores reflected higher empathy).

Results: Primary analyses were linear and logistic regressions. Donors who witnessed others experiencing reactions had higher BDRI scores and were more likely to report symptoms to the nurse during the procedure. They also showed smaller compensatory heart rate increases than those who did not see a reaction. The regression of BDRI score yielded a significant interaction, such that donors high in affective dissonance who saw a reaction reported the most symptoms. These individuals were also more likely to require treatment during donation than those with lower affective dissonance scores. Other

regression analyses found that, in contrast, higher cognitive empathy scores buffered the impact of seeing another experience a reaction, leading to a reduced likelihood of reporting distress and of requiring treatment during donation.

Conclusions: The results of the present investigation suggest that psychosocial contagion of physical symptoms can occur. The moderating effects of empathy differed depending on the subtype of empathy in question. Perhaps a better cognitive understanding of how other people are feeling can function as a coping response, whereas feeling sympathetic about others' distress increases one's own.

110) Abstract 1053

HIGHER CHILDHOOD EXPOSURE TO ACTIVE AND PASSIVE TRAUMA ARE ASSOCIATED WITH BLUNTED CARDIOVASCULAR STRESS REACTIVITY

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Background:

Exposure to trauma in childhood may influence changes in stressor-evoked physiological reactivity in adulthood. However, research exploring this relationship has been ambiguous, with some studies finding hyperreactivity to acute stress and others finding blunted reactivity. Varying definitions and categorization of childhood trauma may be a possible explanation for these equivocal results across studies. Categorizing trauma into different dimensions, such as threat (i.e., active trauma) and deprivation (i.e., passive trauma), could help clarify how trauma affects acute responses to stress.

Aim:

To examine the association of systolic blood pressure (SBP), diastolic blood pressure (DBP), and pulse rate (PR) reactivity to acute stress with childhood exposure to threat and deprivation.

Method:

Participants (N=116, mean age (SD)= 19.53 (0.80) years, 68.1% female, 64.7% white, 81.9% non-Hispanic) completed a 10-minute baseline period and a 4-minute Paced Auditory Serial Addition Task (PASAT), a standardized mental arithmetic task designed to induce stress. Cardiovascular measurements were taken every two minutes during baseline and every minute during the PASAT. Cardiovascular reactivity was calculated as average stress - average baseline. Participants completed the Childhood Trauma Questionnaire, which includes 10 questions about neglect (i.e., deprivation) and 15 about abuse (i.e., threat).

Results:

Linear regression analyses indicated that higher deprivation and threat scores were statistically significantly associated with lower SBP, DBP, and PR reactivity to acute psychological stress (all p 's < .05).

Conclusions:

The current results suggest the relationship between childhood adversity and altered cardiovascular responses to stress is evident in both deprivation and threat. The current results suggest that childhood exposure to trauma, regardless if the trauma is active or passive, alters cardiovascular responses to stress in adulthood. Future research should aim to examine if the effects of childhood trauma on the physiological system are seen earlier (i.e., during childhood). Longitudinal research is needed to understand how these alterations may predispose individuals with a history of trauma to adverse health outcomes in adulthood.

111) Abstract 1642

MOBILE PHONE USAGE AND ITS IMPLICATION ON THE HUMAN STRESS SYSTEM

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Background: With the increasing accessibility of mobile phones to the general public, there are growing opportunities to utilize the advances of technology to understand how it affects human physiology. The objective of this study was to examine how specific types of mobile phone use activities are correlated with a physiological biomarker of stress: salivary alpha amylase (sAA). Compared to less frequent mobile phone users, past literature has found that sAA levels, in general, are lower in frequent mobile phone users. These studies, however, do not take into consideration the distinct types of phone use activities that may be differentially correlated with physiological stress. Our study intends to fill these gaps in research by investigating the association between a diverse range of mobile phone use activities and sAA. **Methods:** Participants (N=174, mean age = 20.36, 77.3% female) completed a general phone usage survey to compute time spent on various activities (i.e., talking, texting, gaming, or social media browsing) and provided a saliva sample to assess their resting level of sAA. A bivariate correlational analysis was conducted to examine the relation between specific phone use activities and stress levels. **Results:** Our results suggest that there is a significant positive association between sAA and time talking on the phone ($r = .220, p = .003$), but no significant correlation between sAA and texting ($r = .073, p = .350$), gaming ($r = -.031, p = .691$), or social media browsing ($r = .063, p = .440$). Follow up linear regressions reveal that, after controlling for sex, age and ethnicity, these associations remain consistent. **Conclusion:** These findings indicate that individuals who spend more time talking on the phone have higher resting sAA levels than those who spend less time talking on the phone. A possible explanation for this finding may be that talking on the phone evokes more stress than in-person interactions as individuals are not able to evaluate nonverbal signs of communication. Our findings highlight the reasoning that various types of mobile phone use activities are uniquely associated with physiological biomarkers of stress. Future studies should investigate how other stress biomarkers may correlate with certain types of mobile phone use activities.

112) Abstract 1226

REPORTS OF EXPOSURE TO RACISM AND BLOOD PRESSURE: MODERATING INFLUENCE OF RACIAL IDENTITY

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Exposure to racism is associated with negative health outcomes (Zapolski, Beutlich, Fisher, & Barnes-Najor, 2019). African Americans in particular are vulnerable to experiencing negative health-related outcomes that are in part, the sequelae of frequent exposure to discrimination. Exaggerated psychological and physiological responses to racism are early markers (Hill et. al., 2017). Research suggests that the psychological impact of exposure to chronic or acute forms of racism, include depression, anger, lowered life satisfaction and self-esteem, and feelings of loss, helplessness, and fear (Utsey & Hook, 2007). Additionally, alterations in immune, neuroendocrine, and cardiovascular functioning are associated with reports of racial encounters and exposure to racism in a laboratory setting (Clark et. al., 1999; Merritt et. al., 2006). Although disparities in health and life expectancy persist for African Americans (Chae, Clouston, Hatzenbuehler...& Link, 2015), research shows that having a positive racial identity buffers the detrimental effects of racial tension that emerge in social interactions (Cross, 1991). The present study examined the moderating effect of racial identity on the relationship between self-reports of exposure to racism and measures of blood pressure in Black college students. Sixty African American students completed the Racism and Life Experiences Scale (Harrell, 1994), the Multidimensional Inventory of Black Identity- short form (Sellers, 2013), among other demographic and health related measures. Blood pressure readings were obtained on a separate occasion as participants rested and after they imagined a racially noxious scene. Both mean

arterial pressure and diastolic blood pressure responses to racial imagery were positively related to reports of previous exposure to racism. Changes in systolic blood pressure were not significant. Identity measures did not moderate the relationship between reports of discrimination and blood pressure reactivity, but these findings support the notion that encounters with racism may enhance physiological responses to race-related stressors. Further research into the contexts in which identity may buffer responses to racism is still needed as these results provide limited insight into the blood pressure measures that may link racism to health outcomes (Brondolo, Kelly, Coakley...& Contrada, 2005).

113) Abstract 1824

EMOTIONAL RESPONSES TO A STRESSOR AND ITS RELATIONS TO INFLAMMATION

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Historically, negative affect has been associated with decreased mental and physical health. However, several of our recent papers have found that moderate levels of negative affect in response to stressful life events is associated with better health outcomes. Furthermore, studies have found that an absence or low levels of negative affect during stressful life events is associated with greater allostatic load and impaired immune functioning. This body of work, however, has tended to use retrospective reports of stressful life events and emotional reactions. Such retrospective reports are susceptible to biases and memory errors. In the current study, we expand on this literature by looking at the relationship of increased negative affect following induction of a stressful event and interleukin-6 (IL-6), a chronic measure of inflammation. At the beginning of the lab visit, participants ($N = 150$, female = 84, $M_{age} = 18.81$) provided blood samples and then underwent the Trier Social Stress Test to induce stress. Emotions were self-reported using the Positive Scale of Positive and Negative Affect Schedule pre and post stressor. Generalized Linear Model (GLM) approach was taken in analyzing this data and we included gender, income, race, physical activity, and body-mass-index as covariates. In line with our hypothesis, we found that an increase in negative affect in response to a stressful life event was negatively correlated with levels of IL-6. This suggests that experiencing negative affect in response to a stressful events may be healthier than not experiencing negative affect in these situations. Negative affect has often been generalized as being worst for one's health, but it is becoming clearer that this black-and-white thinking in regards to positive and negative affect is oversimplified.

114) Abstract 1785

MITOCHONDRIAL PHENOTYPES IN IMMUNE CELL SUBTYPES IN ADULT WOMEN AND MEN

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Objective: Psychosocial exposures influence immune cell functioning, which is directly dependent on the health of their mitochondria. Moreover, evidence indicates that mitochondria respond to psychosocial factors, suggesting that mitochondria may mediate the effects of stress on immune cells. We have developed an approach to quantify mitochondrial health in mixed leukocyte populations, but different immune cell subtypes may contain different mitochondrial phenotypes and therefore unique sensitivities to psychosocial

exposures. Moreover, little is known about the influence of age and sex on mitochondria. Therefore, the purpose of this study is to provide cell-type specific profiles of mitochondrial function in relation to age, sex, and other key biomarkers.

Method: Blood was collected from 21 healthy individuals (11 women and 10 men) divided across four decades of life (20-60 years), for each sex. Ongoing studies, which will be presented on, are profiling mitochondrial functions in sorted immune cell subtypes, and examining their associations with allostatic load biomarkers and circulating cell-free mitochondrial DNA (ccf-mtDNA). As a foundational first step, we quantified the abundance of 14 immune cell subtypes and sorted the most abundant cell types by flow cytometry to analyze their association with age and sex.

Results: The most abundant cell types were Monocytes, Neutrophils, CD4 T cells, and CD8 T cells, which each composed 5-26% of total leukocytes. Women had more CD4 T cells than men ($d=0.94$, $p<0.05$), ($d=1.18$, $p=0.01$), whereas differences in activated, memory (central and effector), and late-differentiated (TEMRA) subtypes were less pronounced. With increasing age, the proportion of CD8 T cells decreased by more than half (22 to 9%, $r^2=0.31$, $p<0.01$), an effect mostly driven by a loss of naïve CD8 T cells with increasing age ($r^2=0.46$, $p<0.001$). Higher counts for naïve CD4 and CD8 T cells tended to be positively associated with the pro-inflammatory marker ccf-mtDNA ($r^2=0.10-0.14$).

Conclusion: Our data in healthy individuals demonstrate substantial inter-individual variation in immune cell subtype distribution, up to half of which is attributable to age and sex. Ongoing work will establish the added value of cell-type specific mitochondrial profiles over mixed cell populations to examine psychobiological mechanisms.

115) Abstract 1079

HIGH AROUSAL POSITIVE AFFECT IS ASSOCIATED WITH BETTER SUBJECTIVE SLEEP AMONG MIDLIFE ADULTS

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Background: Impaired sleep is associated with a constellation of poor health outcomes, including increased cardiometabolic risk and premature all-cause mortality. Previous research suggests that 1 in 3 adults report sleep impairment. In general, higher positive affect (PA) and lower negative affect (NA) have been associated with better sleep. Despite the potential for affective arousal to be associated with sleep, little is known about how affective arousal is associated with sleep health, and whether it differs by valence (positive vs. negative). The present study examined the associations of high and low arousal positive and negative affect with sleep indicators (sleep duration, efficiency, and quality). **Methods:** A community sample ($N=121$) of midlife adults (ages 25-65: $M=42.10$, 60% women) participated in a seven-day ambulatory assessment study. Participants provided seven reports of affect each day (using items reflecting high and low arousal for both positive and negative affect), and morning reports of previous nights' sleep. Momentary affect reports were aggregated to both the day and person-levels for analysis. Using a multilevel model building approach, high and low arousal PA and NA were used in independent models to predict sleep (e.g., only low arousal PA or high arousal NA predicting sleep), covarying for weekend and work days. Final models included all measures of affect, with covariates. **Results:** Within-persons, daily variation in high and low arousal NA and PA were unrelated to daily sleep indicators. Between-persons, high arousal NA was unrelated to sleep indicators but high arousal PA predicted better sleep duration, efficiency, and quality in all models. In addition, also at the between-persons level, both low arousal NA and PA showed initial associations with sleep quality, but these results were attenuated to non-significance in final models. **Discussion:** Results from the present study suggest that separating out the arousal and valence

dimensions of affect may be helpful when examining sleep. Our findings suggest that persons with greater average high-arousal PA report better sleep across multiple indicators, but that other affective indicators were not uniquely predictive of sleep reports. It may be valuable for future research to examine high arousal PA as a potential protective factor for sleep health among midlife adults.

116) Abstract 1270

STRESSORS AND SLEEP QUALITY AND DURATION AMONG YOUNG ADULTS AT RISK OF TYPE 2 DIABETES

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Background:

Perceived discrimination, stress, and sleep difficulties have been associated with health outcomes such as cardiovascular diseases, psychological disorders, and unhealthy health behaviors. Minority groups have a higher prevalence of low sleep duration (< 7 hours) than their Caucasian counterparts. One theory is that perceived discrimination and stress may contribute to these sleep rates. The aim of this study is to assess the association of both discrimination and stress with sleep quality and duration among primarily minority college students ages 18-25 with a family history of type 2 diabetes (T2D).

Methods:

Data for this study were collected from the ongoing Metabolism and Stress Assessment (MeSA) pilot study with the primary aim of determining obesity risk factors among young adults with a family history of T2D. The target population for the pilot study is (n=100). Participants completed the Williams' Everyday Discrimination Scale (EDS), Cohen's Perceived Stress Scale (PSS10), and the Pittsburg Sleep Quality Index (PSQI). EDS scores were categorized into tertiles (low, moderate, and high) for descriptive purposes. PSS scores were categorized into quartiles with a cut of 0-9 for no/low stress, 10-15 medium-low stress, 16-20 medium stress, and more than 20 highly stress. Sleep quality and sleep duration were assessed using the respective single-item questions from the PSQI. Spearman Rho correlations were performed to determine if there was a relationship between EDS and sleep quality and duration.

Results:

At baseline, participants (n=24) mean age was 21.33 years (SD=1.83) and 66.7% female. There were 56.5% Hispanic, 21.7% Asian, 13% White, and 8.3% Black. The mean amount of sleep duration was 6.7 hours (SD=1.04). Results showed that there was a moderate positive correlation between EDS and sleep quality ($r = .53, p = .008$), but not for sleep duration ($r = -.19, p = .39$). For perceived stress, sleep quality showed a moderate positive correlation to PSS ($r = .65, p = .001$) and a moderate negative correlation to sleep duration ($r = -.66, p < .001$).

Conclusion:

Our results suggest that higher discrimination and perceived stress were associated with poor quality sleep and short sleep duration. Our early results suggest that further study of perceived stressors and its relationship to sleep traits are warranted.

117) Abstract 1510

MENTAL HEALTH SYMPTOMS MEDIATE THE ASSOCIATION BETWEEN MINORITY STRESSORS AND SLEEP DURATION IN TRANSGENDER AND GENDER NONCONFORMING PERSONS

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Background: Transgender and gender nonconforming (TGNC) persons experience health disparities related to discrimination and marginalization. Despite well-documented disparities in mental health, few studies have examined the influence of minority stressors and/or mental health on sleep duration in this population.

Hypothesis: The association between minority stressors (discrimination, stigma consciousness, and internalized transphobia) and adequate sleep duration will be mediated by mental health symptom severity.

Methods: We used data from Project AFFIRM, a longitudinal study consisting of a diverse sample of TGNC people. Scales for discrimination ($\alpha = 0.85$; range 0-10), stigma consciousness ($\alpha = 0.80$; range = 1.90-6.90), and internalized transphobia ($\alpha = 0.89$; range = 1.40-6.40) were reliable. Adequate sleep duration was measured by the average number of hours of sleep during the past month (adequate = 7-8 hours; 0 = inadequate; 1 = adequate). We used the Global Severity Index to assess mental health symptom severity ($\alpha = 0.88$; range = 0-72). We used path analysis to examine the direct and indirect effects (through mental health symptom severity) between minority stressors and sleep duration.

Results: The sample consisted of 259 participants (49.8% were transmasculine; mean age 35.9 years; 49% Non-Hispanic White) of which 100 (38.6%) met criteria for adequate sleep duration. All mediation models had adequate fit. The direct effects of discrimination (aOR 0.99; 95% CI = 0.87-1.14), stigma consciousness (aOR 1.12; 95% CI = 0.82-1.54), and internalized transphobia (aOR 0.85; 95% CI = 0.62-1.17) were not significant. However, mental health symptom severity mediated the association between discrimination (aOR 0.98; 95% CI = 0.97-0.99), stigma consciousness (aOR 0.96; 95% CI = 0.93-0.98), and internalized transphobia (aOR 0.97; 95% CI = 0.96-0.99) with adequate sleep duration. The total effects of minority stressors on sleep duration were not significant.

Conclusions: Our findings suggest that mental health symptoms mediate the association between minority stressors and sleep duration in TGNC persons. Addressing mental health symptom burden may be a treatment target for improving sleep duration in this population. This is particularly important given the established associations between sleep duration with mental and physical wellbeing.

118) Abstract 1075

TO CREEP OR NOT TO CREEP? THE HEALTH EFFECTS OF SOCIAL MEDIA CREEPING ON AN EX-PARTNER AND THE INFLUENCE OF POSTTRAUMATIC STRESS SYMPTOMS

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Background: Life events not meeting traumatic criteria set forth by the DSM-5 can still precipitate posttraumatic stress symptoms (PTSS) similarly to those that do meet criteria. Relationship stressors, like the ending of a serious relationship, may contribute to PTSS. Similarly, social media "creeping" on an ex-partner, including monitoring the former partner's social media activity, may further contribute to poorer adjustment following the breakup. Although social media creeping is common and socially acceptable among young adults, little is known about its potential effects on psychological and physical health, especially in the context of post-breakup PTSS.

Method: As part of a larger study, we examined breakup-related PTSS, Facebook (FB) creeping, and indicators of health (i.e., self-reported health, resting blood pressure [BP], and heart rate) among 57 healthy adults (average = 19.5 \pm 1.8 years; 80.7% female) who experienced a breakup more than 1 month ago but within the past 5 years, and who had been in the relationship for at least 6 months prior to the breakup (average length = 19.6 \pm 12.3 months).

Results: Hierarchical regressions controlling for age, sex, body mass index, and time since the breakup revealed breakup-related PTSS as being significantly associated with worse self-reported mental health ($\Delta R^2 = .11, p < .01$), but no other health indicators. No main effect of FB creeping on mental or physical health outcomes was observed. However, using PROCESS Macro model 1, breakup-related PTSS and FB creeping interacted when analyzing systolic ($\Delta R^2 = .11, p < .01$) and diastolic ($\Delta R^2 = .16, p < .01$) BP. Specifically, the interaction was significant at lower levels of PTSS, such that FB creeping was

positively associated with both systolic and diastolic BP, but not in people with higher PTSS.

Conclusions: FB creeping does not appear to contribute to psychological or physical health outcomes on its own, however breakup-related PTSS is associated with self-reported mental health. When considered together, FB creeping may contribute to poorer cardiovascular functioning at lower levels of PTSS, even for healthy young adults. Future research should identify potential mechanisms by which social media creeping affects the cardiovascular system, such as via repeated increases in sympathetic activation when creeping or engagement in maladaptive coping behaviors.

119) Abstract 1188

THE ROLE OF IFN- γ AND GAMMA-PRODUCING SENESCENT T CELLS IN THE SOCIAL FUNCTIONING OF OLDER ADULTS

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Background: Interferon- γ (IFN- γ), a cytokine that increases in production as part of the normal aging process via senescent T cells, promotes social behavior in mice and may be related to higher levels of sociability in humans. Although senescent T cells have biological disadvantages, increased production of IFN- γ may be important in facilitating sociability in older age. This project tested whether a higher proportion of senescent T cells, suggestive of greater production of IFN- γ , predicted sociability in aging adults.

Methods: Participants (N=123) were drawn from a long-term, ongoing observational study of healthy older adults. The sample had mean age of 79.1 years ($SD = 5.3$), was 56% female, and 94% Caucasian. Proportion of T cells (CD3+) identified as senescent (CD8+CD28- and CD8+CD57+) were analyzed via flow cytometry. Sociability was measured as the sum of standardized network diversity and network size from the Social Network Index and social resources from the Conservation of Resources Evaluation.

Results: Sociability was not associated with T cell senescence ($r = .125, p = .17$) or covariates, including age ($r = -.006, p = .94$), sex ($r = .085, p = .32$), race ($r = -.079, p = .35$), and cytomegalovirus status ($r = .093, p = .29$). Sociability was not significantly predicted by proportion of senescent T cells ($b = .115, p = .21$), a relationship attenuated further after adjusting for covariates ($b = .089, p = .45$). Bayesian Regression was conducted to better understand the model; the Bayes Factor was .19, indicating moderate support for the null hypothesis (i.e. the null hypothesis was approximately 5 times more likely to be true than the alternative).

Conclusion: These null results suggest that although immunological status may predict sociability in animal models, it is not a major factor in aging humans. However, the relationship between immunosenescence and social behavior has not yet been thoroughly investigated in humans; accelerated developmental changes in aging may be useful for investigating this relationship. Future longitudinal analyses could compare lagged effects within participants. Further, although senescent T cells produce IFN- γ , a direct measure of IFN- γ in may provide additional information.

120) Abstract 1738

MARRIAGE ON THE BRAIN: SUPPORTIVE MARRIAGES PREDICT POSITIVE NEUROBIOLOGICAL CHANGES

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Spouses in supportive marriages have better health than those in less supportive marriages. These health-enhancing benefits are often transmitted through biological pathways, including immune, endocrine, and cardiovascular function. Social neuroscience research has also identified brain-derived neurotrophic factor (BDNF) as a neurobiological mechanism linking socially supportive environments to improved health. High levels of BDNF—a key mediator that promotes neuronal survival, proliferation, and plasticity—reduce the risk of mood disorders and neurodegenerative diseases, such as dementia and Alzheimer's disease. As with other biological factors, BDNF may serve as a pathway from marriage to health. This study examined whether spouses' global marital support perceptions, as well as supportive behaviors during a conflict discussion, promote higher BDNF. Participants were 86 individuals (43 married couples, average relationship length = 11.5 years, mean age = 38) who completed two in-person visits about 4 weeks apart. Global perceptions of spousal support were assessed at the first visit. Couples engaged in 20-minute marital conflict discussions at each visit, and blood was drawn upon arrival and 4 hours after the discussion. Positive behaviors (i.e., acceptance, relationship-enhancing attribution, self-disclosure, humor, and constructive problem solving) during the discussions were coded. Negative behaviors were also coded and controlled for in the analyses. Additional covariates included visit, age, sex, race, depression, activity level, and trunk fat. Multilevel models showed that, across the visits, greater spousal support was related to higher BDNF ($b = 1396.61, p = .009$). During the conflict discussions, one's own self-disclosure ($b = 917.06, p = .005$), as well as mutual self-disclosure (i.e., both spouses self-disclosed; $b = 562.16, p = .037$), were associated with greater BDNF reactivity. These findings suggest that highly supportive marriages promote higher average BDNF levels, and that when individuals and their partners express feelings, wishes, or beliefs during conflict discussions, there are greater positive changes in BDNF. This study identified a novel marriage-related neurobiological pathway that provides insight into understanding how global marital perceptions, as well as context-specific behaviors, may promote long-term health.

121) Abstract 1386

PERCEIVED STRESS IS ASSOCIATED WITH ALTERED PROFILES OF AFFECTIVE DYNAMICS

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A growing body of literature shows associations between affective dynamics on a momentary level (i.e., the structure of moment to moment fluctuations) and psychological well-being states. Evidence from laboratory exposure to acute stressors suggests a robust association between stress and affect, yet there is no evidence that global levels of perceived stress is linked to the way affective states fluctuate throughout a day. In this study, we examined whether perceived stress is associated with mean levels, variability, and inertia (measure-to-measure predictability) of positive and negative affective states collected using Ecological Momentary Assessment (EMA) methods every half hour over a single day in a sample of mostly middle-aged working adults ($n=859$). Furthermore, since affective dynamics and the stress—affect association are hypothesized to vary across the lifespan, we examined if age was associated with affective dynamics and if it moderated the association between stress and affective dynamics as predicted by the Strength and Vulnerability Integration (SAVI) theory. Using dynamic structural equation modeling (DSEM), we found that higher levels of perceived stress was associated with lower mean levels of positive affect and higher mean negative affect, higher variability in both positive and negative affect, and higher inertia of negative affect. Age-related findings were less

consistent across different affective states, and there were no significant interactions between age and stress in predicting affective dynamics or mean levels of affect. These results suggest that perceived stress plays a key role in altered affective dynamics and add to our understanding of the possible mechanisms by which stress may influence overall well-being and health.

122) Abstract 1310

PERCEIVED STRESS AND CIGARETTE SMOKING AMONG HIV INFECTED AND UNINFECTED COCAINE USERS

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Stress is associated with poor mental and physical health outcomes, and cigarette smoking can negatively impact disease progression in HIV⁺ individuals. The objective of the current study was to examine the association between perceived stress and cigarette smoking in HIV⁺ cocaine users (HIV⁺COC⁺). We hypothesized that perceived stress and depression will predict cigarette smoking in HIV⁺COC⁺ users. The sample was 75 participants aged 36.18 ± 9.5 years, recruited from the local community. Depression was assessed using the Center Epidemiological Scale for Depression. Stress was evaluated using the Perceived Stress Scale. The Structured Clinical Interview for DSM-IV was used to examine cocaine use and self-reported smoking status was obtained for cigarette smoking. A series of generalized linear models were run examining potential differences in smoking behaviors and stress among the four different groups, HIV⁺COC⁺, HIV-infected non-cocaine users (HIV⁺COC⁻), HIV-uninfected cocaine users (HIV-COC⁺) and HIV-uninfected non-cocaine users (HIV-COC⁻). Approximately half the participants (51%) were current smokers and more than half (65 %) were former smokers. Results show that current smoking was the highest in HIV⁻ COC⁺ (82%), followed by HIV⁺ COC⁺ (74%), and then the HIV⁺ COC⁻ (35%) and HIV-COC⁻ (30%) users. Neither HIV status ($\chi^2(1) = 0.68, p = .41$), perceived stress ($\chi^2(1) = 0.28, p = .596$), nor depressive symptomatology ($\chi^2(1) = 1.18, p = .278$) were related to smoking. Only the factor for cocaine use predicted likelihood of smoking ($\chi^2(1) = 18.7, p < .001$). Non-cocaine users were approximately 95.1% less likely to smoke than cocaine users, controlling for all other variables. Overall, cocaine use was the strongest predictor of cigarette smoking and the number of cigarettes smoked per day. Findings suggest the importance of including smoking cessation plans when developing interventions for cocaine use among HIV infected individuals.

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123) Abstract 1193

CLINICAL FEATURES OF OLFACTORY REFERENCE SYNDROME WITH IRRITABLE BOWEL SYNDROME-LIKE SYMPTOMS: AN INTERNET-BASED STUDY

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Background: Olfactory reference syndrome (ORS) is characterized by a preoccupation focuses on the belief that one emits a foul or offensive body odor. ORS appears in DSM5 under “Other Specified Obsessive Compulsive Disorders (OCD)” as *Jikoshu-kyofu*. Kobayashi (2015) reported that the prevalence of comorbid irritable bowel syndrome (IBS) is high (53%) in patients with ORS who complain about malodor from flatulence. This study investigated the various aspects of clinical features of ORS with IBS-like symptoms using internet-based methods.

Methods: Participants were recruited online, included 16 years or older and had self-reported both ORS and IBS-like symptoms. Totally, 203 participants (m/f=38/165, mean age=30.7, SD=11.7) meet the criteria. IBS-like symptoms were measured using the Japanese version of the IBS severity index (IBS-SI-J). ORS were measured by the scale for OCD, the Japanese version of the self-report Yale-Brown Obsessive Compulsive Scale (Y-BOCS) modified for this study. We also investigated various characteristics (i.e., age of onset for IBS-like symptom/ORS), depression and suicidal ideation were assessed using Beck Depression Inventory II (BDI-II). Pearson’s correlation was used for the analysis.

Results: The mean of IBS-SI-J was graded as moderate severity (M=243.0, SD=101.1) as was that of Y-BOCS modified for this study (19.8, 7.6). The correlation between scores on IBS-SI-J and Y-BOCS modified for this study was moderate ($r=0.37, p<.01$). The onset of IBS-like symptoms preceded in 32.0%, while that of ORS preceded in 4.4%, simultaneous onset was found in 61.6%, and unknown in 2.0%. The mean age of onset of ORS was 17.2 (8.1) and that of IBS-like symptoms was 16.1 (8.2). The mean score of BDI-II indicated moderate depression (25.4, 13.6) and its correlation with IBS-like symptom were $r=.40$ ($p<.01$), that with Y-BOCS modified for this study were $r=.62$ ($p<.01$). Importantly, 139 of 203 participants (68.5%; they checked 1-3 on BDI-II item no.9) had a suicidal ideation.

Conclusions: The severities of ORS, IBS-like symptoms and depression were all moderate, and the risk of suicide was high in this sample. The result regarding age of onset of ORS/IBS-like symptoms suggested that the IBS-like symptoms may precede ORS in many cases. This study provides new findings for the research on comorbidities of ORS, IBS-like symptoms and other related disorders.

124) Abstract 1240

INDIVIDUAL DIFFERENCES IN AESTHETIC ENGAGEMENT AND STRESS RESILIENCE: EXAMINATION OF GROWTH ORIENTATION AS A POSSIBLE MECHANISM

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Prior research indicates that individual differences in aesthetic engagement, the propensity to be moved by art, nature, and beauty and a facet of the personality factor Openness to Experience, are associated with adaptive stress regulation. However, the mechanisms underlying this relationship remain unclear. One hypothesis is that aesthetic engagement is related to a regulatory striving style involving appraisal of stressors as an opportunity for growth, which in turn mitigates downstream cognitive, behavioral, and neuroendocrine stress-related outcomes. The association between aesthetic engagement and growth orientation was investigated in two studies using both behavioral coding and self-reports. Study 1 ($N=174$) was an online survey study in which participants completed the COPE Inventory, NEO-PI-3, Cognitive Flexibility Inventory (CFI), and the Propensity to Aesthetic Chill Experiences (PACE), an expanded aesthetic sensitivity inventory. Study 2 ($N=77$) was a laboratory stress study in which

regulatory motives across two different recent stressors were assessed using the behavioral coding protocol for the Social Competence Interview (SCI). The SCI involves “re-living” a recent stressor and then formulating a hypothetical ideal ending to the stressor situation. Measures also included the NEO PI-R. In Study 1, we observed significant correlations between the positive reinterpretation and growth subscale of the COPE inventory and Openness ($r=.32, p<.001$), the Aesthetics facet ($r=.22, p<.01$), and the PACE ($r=.45, p<.001$). Similar associations were seen between the CFI and Openness ($r=.31, p<.001$), Aesthetics facet ($r=.21, p<.01$), and PACE ($r=.43, p<.001$). Results of Study 2 revealed that the Aesthetics facet was significantly positively correlated with behaviorally coded ratings of growth orientation averaged across stressors (e.g. ‘wanting to improve him/herself as a person’; $r=.27, p<.05$) and negatively associated with a defensive regulatory style (e.g. ‘wanting to get even with someone/get revenge’, $r=-.27, p<.05$). Taken together, current findings suggest that individuals high in aesthetic engagement tend to seek out opportunities for growth and self-improvement in the context of stress, a regulatory striving style that may confer resilience to the adverse effects of stress.

125) Abstract 1883

HAIR CORTISOL/DHEA RATIOS AMONG INFORMAL DEMENTIA CAREGIVERS

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Informal dementia caregivers experience chronic stress which is associated with HPA axis dysfunction. For example, dementia caregivers have been shown to have higher salivary cortisol/dehydroepiandrosterone (CORT/DHEA) ratios than non-caregivers. Much of the prior research on the HPA axis among dementia caregivers relies on saliva and serum samples, which are subject to situational variability and acute influences. Hair hormone CORT/DHEA concentrations may better reflect the long-term stress of caregiving. The present study investigated hair CORT/DHEA ratios in a sample of informal dementia caregivers and non-caregiver controls. The proximal 1 cm of hair was obtained to index hormone output over the prior month. CORT and DHEA concentrations were determined, and CORT/DHEA ratios were calculated; all were positively skewed, so were log transformed. Perceived stress and social support were also assessed. All linear regression analyses controlled for sex and age, which differed by caregiver status. The final analytic sample with complete, non-outlying data was 54 participants (23 caregivers, 31 controls). Results indicate that caregivers exhibited lower hair CORT/DHEA ratios compared to controls, $B = -.362, SE = .373, t(50) = 2.87, p = .006$. The pattern of results was similar but non-significant when hair hormone concentrations were examined separately; caregivers had marginally lower CORT ($B = -.265, SE = .331, t[50] = 1.92, p = .061$) and marginally higher DHEA ($B = .241, SE = .123, t[50] = 1.70, p = .095$). Caregivers also reported greater perceived stress ($t[52] = 2.40, p = .020, d = 0.83$) and greater perceived support compared to controls ($t[52] = 2.05, p = .045, d = 0.57$). We explored whether perceived stress or social support explained the observed effects by entering them separately into regression models. Greater social support predicted lower CORT/DHEA ratios, $B = -.297, SE = .028, t(50) = 2.49, p = .016$. When social support was included, the effect of caregiver status on CORT/DHEA ratios was reduced, $B = -.201, SE = .325, t(49) = 1.48, p = .145$. There was no independent effect of perceived stress on CORT/DHEA ratios, controlling for caregiver status, age, and sex. These findings contradict prior salivary hormone findings and suggest that elevated social support among informal dementia caregivers is associated with reduced hair CORT/DHEA ratios.

126) Abstract 1071

BEYOND THE IVORY TOWER: TRANSLATING THE SCIENCE OF CLIMATE CHANGE AND HEALTH EQUITY INTO ADVOCACY FOR ENVIRONMENTAL JUSTICE

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Climate change is the largest public health concern facing human health today. The medical and public health issues that currently hold the attention of the academic community pale in comparison to the effects that climate change will have on the health of future generations. We are already seeing the impact of climate change on pulmonary function, kidney disease, susceptibility to heat-related illness, and vector borne diseases. Recently, there has been an increase in the visibility of this concern among academic circles with high impact journals now giving publication space to this matter. Despite this forward movement, more effort is needed to address the health equity aspects of climate change.

Blacks, Indigenous born, and Persons of Color (BIPOCs) experience the impacts of climate change at disproportionate rates. Race is a significant predictor of exposure to environmental hazards including air pollution, oil refineries, and toxic waste facilities with more BIPOCs breathing polluted air and living in locations where environmental hazards exist. BIPOCs are also less likely to enjoy the benefits of environmental sustainability policies. While the literature has demonstrated the health and stress-buffering benefits of spending time in restorative natural environments, BIPOCs have significantly less access to green space than their white and more affluent counterparts.

The contribution of the healthcare sector to climate change presents an ethical quandary. Healthcare providers commit to the Hippocratic Oath and pledge to “do no harm.” Yet, the practice of healthcare is currently exacerbating the very diseases that are being treated and the impact of this practice disproportionately affects the most marginalized and vulnerable populations. The academic literature is important for informing evidence-based practice and documenting the relationship between climate change and health inequity and can bolster efforts to translate science into policy and advocacy.

Attendees of this presentation will learn how dissemination and implementation science has informed environmental justice efforts within two large healthcare systems in the Twin Cities Area. Additionally, attendees will learn practical steps to take to broaden the impact of the science beyond the ivory tower so it has a greater opportunity to benefit the patients and communities who need it most.

127) Abstract 1766

PRENATAL POLYDRUG EXPOSURE EFFECTS ON INFANT DEVELOPMENT AND SYMPATHETIC ACTIVATION AT 6 MONTHS

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Introduction: Prenatal drug exposures are increasing as a result of the growing opioid epidemic. However opioids are rarely used in isolation during pregnancy and are often accompanied by nicotine, cocaine and other drugs. Developmental and behavioral correlates in early life are important to document and understand may influence future development.

Methods: We examined differences in postnatal development measured by Bayley III Scales of Infant and Toddler Development, Stiff Face Paradigm, and salivary alpha amylase at in 57 infants (28 Males) tested at 6 months postpartum. Mothers were recruited in pregnancy to document prenatal exposures with biological confirmation. The sample consisted of 36 drug free infants and 21 infants with prenatal polydrug exposure with cocaine/opioids/nicotine. A majority were exposed to cocaine, opioids and nicotine (17 cocaine (14 with opioids+cocaine; 13 opioids + cocaine+nicotine).

Results: Significantly lower Bayley Cognitive scaled scores (8.97 ± 0.36 vs 20.95 ± 0.39 , $p=.0007$) were predicted by polydrug group with no effect of infant sex. Higher maternal education was associated with higher Cognitive ($r=+0.39$, $p=0.03$, $n=53$) and Motor ($r=+0.38$, $p=.012$, $n=46$) scores. Lack of material resources, indexed by state Average Deprivation Index, also predicted lower Motor scores ($r=-0.41$, $p=.004$, $n=46$).

Lower Bayley Cognitive, Language and Motor scores were also associated with greater sympathetic nervous system (SNS) activity indexed by infant salivary alpha amylase (sAA) at baseline, and averaged across Still Face Paradigm values (mean sAA with Cognitive ($r=-0.31$, $p=.041$), Language ($r=-0.58$, $P=.0001$), and Motor ($r=-0.36$, $p=.029$)). Polydrug exposure did not predict sAA values but prenatal nicotine was related to higher mean sAA across Still Face Paradigm compared with non-nicotine exposure (55.8 ± 9.1 vs 37.3 ± 5.9 mcg/ml, $p=.04$), and higher sAA was related to greater infant heart rates during normal play ($r=+0.50$, $p=0.008$) and mother-infant reunion ($r=+0.49$, $p=.02$).

Conclusion: Prenatal polydrug exposures are related to reduced cognitive, language and motor development at 6 months. Prenatal smoking may increase SNS activity, contributing to cognitive and motor deficits and greater arousal indicated by greater sAA and HR in infants with prenatal polydrug exposures.

128) Abstract 1595

IMMUNOLOGICAL AND PSYCHOSOCIAL FUNCTIONING IN PARENTS OF CHILDREN WITH CANCER

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The current study compares peripheral blood cell analyses and psychosocial functioning self-reports from parents of children being treated for cancer at a major children's hospital and a comparative community sample of parents of healthy children to examine health disparities between these two groups. A sample of 52 parents of children ages 2-15 years participated in the current study, of which 22 parents had a child with cancer. A blood sample was drawn to analyze cellular immune profiles including CD4+ and CD8+ lymphocytes and natural killer (NK) cells. Parents also completed the Perceived Stress Scale (PSS), Medical Outcomes Study Short Form (MOS, a quality of life measure), and Patient-Reported Outcomes Measurement Information System Short Form 8a (PROMIS, an emotional distress measure). Independent samples *t*-tests were conducted to examine differences in outcomes between groups. The sample consisted of parents 37.81 years of age ($SD=5.96$), the majority of whom were mothers (73%). Comparison of monocyte and lymphocyte percentage in peripheral blood revealed significant group differences. Parents of children with cancer had a higher monocyte, $t(50)=2.05$, $p=0.05$, and lymphocyte percentage, $t(50)=2.18$, $p=0.03$, than parents of healthy children. Parents of children with cancer also reported significantly higher levels of stress on the PSS, $t(50)=3.53$, $p=0.002$, worse emotional well-being on the MOS, $t(50)=-4.00$, $p<0.001$ and higher symptoms of both anxiety, $t(50)=3.18$, $p=0.002$, and depression, $t(50)=3.56$, $p<0.001$, on the PROMIS. These findings of poorer immune system functioning coupled with higher reported perceived stress among parents of children with cancer support research that has shown a direct effect of chronic stress on the immune system. Furthermore, higher anxiety and depression symptoms reported by these parents indicate unmet psychosocial needs that may affect long-term health. Given the central role of parents in their child's cancer care, it is compelling to address and work to improve parent immunological and psychosocial well-being. In particular, these findings highlight parents of children with cancer as a neglected and

vulnerable population in comparison to parents of healthy children, warranting action to reduce health disparities between these groups.

129) Abstract 1743

ROLE OF CANCER STRESS AND DAYTIME HEALTH BEHAVIORS IN SLEEP AMONG SPOUSAL CAREGIVERS OF COLORECTAL CANCER PATIENTS

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A cancer diagnosis is stressful not only for patients, but also for spousal caregivers, which can manifest as sleep disturbance. Highly prevalent sleep disturbance in caregivers may be due to their perceived stress from cancer in the family (predisposing factor) and their daytime sleep hygiene behaviors (precipitating factor). This study examined the extent to which cancer-related stress and daytime sleep hygiene behaviors are related to sleep in spousal caregivers of cancer patients. Spousal caregivers ($n=57$, $M=55.4$ years old, 61% female) of newly diagnosed colorectal cancer patients self-reported their cancer-related stress and post-traumatic stress symptoms (IES-R: hyperarousal, intrusion, avoidance) related to their patient's cancer. Modified Consensus Sleep Diary assessed sleep hygiene, including napping, doing things in bed unrelated to sleep, as well as caffeine and alcohol intake, which was completed for 14 consecutive days. Sleep onset latency (SOL), wake time after sleep onset (WASO), and sleep efficiency (SE) were calculated from the diary.

Longer SOL was reported by spouses with high levels of hyperarousal on the day they consumed caffeine ($B=8.47$, $p=.011$). Longer WASO was reported on the day of doing things in the bed unrelated to sleep by spouses with high avoidance, on the day of napping by those with greater cancer stress or with high avoidance, and on the day of consuming alcohol by those high on intrusion ($B>7.31$, $p<.016$). In contrast, shorter WASO was reported on the day of doing things in the bed unrelated to sleep by spouses with greater cancer stress, and on the day of napping by those with high levels of hyperarousal ($B<-9.16$, $p<.048$). Finally, better SE was reported on the day of consuming caffeine by spouses with greater cancer stress ($B=.032$, $p=.048$).

Results highlight that the costs and benefits of daily behaviors on sleep vary by aspects of stress. Findings suggest that sleep interventions for cancer caregivers identify sources of their stress and provide tailored sleep hygiene behavior recommendations. Future investigations should expand utilizing objective sleep measures, examine additional psychosocial factors and sleep hygiene behaviors across patients' different illness trajectory, and replicate in the patient-caregiver dyadic context.

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130) Abstract 1164

ADVERSE CHILDHOOD EXPERIENCES (ACES) AND BMI IN HISPANICS/LATINOS IN THE US: RESULTS FROM THE HISPANIC COMMUNITY HEALTH STUDY/STUDY OF LATINOS (HCHS/SOL) SOCIOCULTURAL ANCILLARY STUDY

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There is a high prevalence of overweight/obesity among Hispanics/Latinos in the US. Adverse childhood experiences (ACEs) have been associated with elevated BMI in this population. ACEs have also been shown to predict a variety of risk factors and chronic diseases. Physical abuse in childhood has been shown to predict adult BMI, particularly in adult women. This study examined whether some types of abuse are more pernicious than others with respect to their association with BMI in a Hispanic/Latino population. In addition, the study assessed whether the associations were stronger for women compared to men.

Participants in the study were self-identified Hispanic/Latino adults (46.6+/-13.6y) participating in the HCHS/SOL Sociocultural Ancillary Study. The HCHS/SOL represents multiple Hispanic/Latino background groups, recruited from the Bronx, NY, Chicago, IL, Miami, FL, and San Diego, CA. At baseline, participants had height and weight measured to the nearest 1.0 cm and 0.1 kg, respectively, to determine BMI. Within 9 months of their clinical baseline exam, participants completed the ACE questionnaire. The ACE consists of 10 items that cover sexual and physical abuse and neglect, emotional abuse and neglect, and family-related adversity.

Participants were 4,670 adults (BMI 30.0+/-6.2; 45% female) identifying as Mexican (36%), Cuban (20%), Puerto Rican (16%), Dominican (12%), Central American (8%), South American (5%), or more than one/Other (3%) background. A weighted complex sample general linear model was conducted with BMI as the outcome and ACE subscore as the predictor thematically clustered as physical, emotional, or family-related. Adjusting for age, income, Hispanic/Latino background, sex, years of living in the US, and education level, physical ACEs (1.56 [.57-2.56]) and emotional ACEs (1.00 [.11-1.90]) were positively associated with BMI; whereas family-related ACEs was not ($p>.33$). When all subscores were included in the model, only physical ACEs was positively associated with BMI (1.25 [.16-2.35]). Associations of ACEs with BMI were consistent across sex groups.

Among Hispanic/Latino adults in the US, having experienced physical or emotional abuse/neglect before the age of 18 is associated with increased BMI in adulthood. Early identification of these types of abuse may present opportunities to identify at risk individuals.

131) Abstract 1891

PSYCHOSOCIAL CORRELATES OF BODY IMAGE STRESS AMONG VENTRICULAR ASSIST DEVICE RECIPIENTS

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BACKGROUND: Ventricular assist devices (VADs) can extend survival and improve quality of life for patients with advanced heart failure. Despite these gains, VAD recipients are at risk for emotional distress as they adjust to life with a VAD, which includes wearing and managing extracorporeal components. The visibility of the VAD may affect patients' perceptions of their appearance; however, there is little research on VAD-related body image stress. The purpose of this study was to examine the relationships between body image stress and psychosocial and VAD-related characteristics.

METHODS: VAD recipients ($N = 72$) rated the extent to which they experience VAD-related body image stress on a one (low) to five (high) scale. Participants also completed questionnaires assessing depression and anxiety, as well as demographic and VAD-related characteristics (e.g., time since implant, functional status). T-tests and

bivariate correlations were used to examine associations between body image stress and psychosocial and VAD-related characteristics. To identify independent correlates of VAD-related body image stress, variables demonstrating significant bivariate relationships with body image stress were entered into a linear regression model.

RESULTS: On average, participants reported a low to moderate degree of body image stress ($M = 2.22, SD = 1.26$). Regarding emotional distress, body image stress was positively associated with both depression ($r = 0.41, p < 0.01$) and anxiety ($r = 0.42, p < 0.01$). Body image stress was also positively associated with impaired functional status ($r = 0.32, p < 0.05$). In terms of demographics, body image stress was negatively associated with age ($r = -0.39, p < 0.01$). To adjust for observed multicollinearity, depression was excluded from the model, and VAD-related body image stress was regressed on anxiety, age, and functional status. This model explained nearly 30% of the variance in body image stress, $F(3, 60) = 8.19, p < 0.01, R^2 = 0.29$. In particular, younger age ($\beta = -0.33, p = 0.01$) and higher anxiety ($\beta = 0.24, p = 0.04$) were significantly associated with greater body image stress.

CONCLUSIONS: Younger and anxious VAD recipients may be at risk for elevated body image stress. Longitudinal research is needed to characterize the long-term relationships between body image stress and clinical and psychosocial outcomes.

132) Abstract 1620

SPONTANEOUS CORONARY ARTERY DISSECTION (SCAD): EMOTIONAL PRECIPITANTS AND PSYCHOLOGICAL CHARACTERISTICS

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Background: Spontaneous coronary artery dissection (SCAD) is increasingly recognized as a cause of type II acute coronary syndrome (ACS; i.e., myocardial infarction resulting from ischemia). In women younger than 60 years of age who are hospitalized with an ACS, the estimated prevalence of SCAD is markedly high, ranging from 23% to 36%, whereas SCAD is rare (<5%) in men. Psychological factors such as depression and acute negative emotions increase the risk of ACS, but the psychological characteristics of SCAD have not been investigated extensively. We assessed the prevalence of emotional precipitants of SCAD and a broad range of clinical and psychological factors in patients with SCAD.

Methods: Patients ($N=183$) were recruited from a Dutch SCAD database and completed online questionnaires. Patients were predominantly female (172/183; 94%), and because of the small number of men ($N=11$), analyses were conducted on female patients only (mean age 52.0 ± 7.5 years, 37% postmenopausal). Precipitants of SCAD were determined in the domains of symptoms, physical exertion, and emotional states in the 24 hours prior to SCAD. Validated questionnaires were used to assess psychological factors, including depressive symptoms, anxiety, fatigue, and perceived stress. The median time duration between the most recent SCAD admission and psychological assessment was 2.2 yr (IQR 1.2-3.8 yr). Clinical information was verified by review of medical records.

Results: Emotional precipitants occurred in 97/172 (56%) of female patients with SCAD, whereas physical exertion was less common (31/172; 18%). A history of burnout was reported by 25%; most participants had a high education level. Hypertension was the only common cardiovascular risk factor (31%). Measures of psychological distress were high in patients who experienced SCAD: moderate to high levels of perceived stress ($PSS-10 \geq 14$; 50%), high fatigue ($FAS-10 \geq 22$; 56%), whereas the prevalence of depression (9%) and anxiety (12%) was relatively low.

Conclusion: This study indicates that negative emotions precipitate the onset of SCAD in more than half of the patients. After having

experienced SCAD, high levels of perceived stress and fatigue were common. These psychological factors may be useful targets, combined with optimal interventions for clinical comorbidities, to develop tailored rehabilitation programs for patients with SCAD.

133) Abstract 1379

FEASIBILITY AND ACCEPTABILITY OF ACUPUNCTURE DURING HOSPITALIZATION FOLLOWING OPEN-HEART VALVE SURGERY: THE ACU-HEART PILOT TRIAL

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Background: Cardiac surgery patients suffer high rates of depression, somatic sequelae (e.g., pain, nausea), and medical complications (e.g., atrial fibrillation). Acupuncture is an effective treatment for depression, pain/nausea, and cardiac arrhythmias. No studies have directly tested the effects of acupuncture on these factors following cardiac surgery. The purpose of this study was to assess the feasibility and acceptability of acupuncture during post-operative hospitalization. **Methods:** This study was a randomized, controlled, feasibility trial of daily acupuncture (ACU) or treatment as usual (TAU) following isolated valve surgery via sternotomy. ACU patients received up to six, 1-hour sessions of acupuncture starting on post-operative day 1 in the patient's room in the intensive care unit. TAU patients had no intervention. To assess the feasibility and acceptability of acupuncture, we recorded rates of eligibility, exclusion, withdrawal, and study completion; reasons for refusal; and acupuncture session completion.

Results: In total, 253 patients were approached and invited to participate in the study. Of those, 45 patients (18%) declined to participate, citing reasons including not interested in research, not interested in acupuncture/traditional Chinese medicine, or feeling stressed about surgery. Sixty-two patients (25%) were lost to follow-up. Among those who consented (n=146, 58% of those approached), 42 (29%) were subsequently excluded, including 11 patients prior to randomization, 14 ACU patients, and 17 TAU patients. Reasons for exclusion included intraoperative factors (e.g., concomitant procedures; n=25), not completing the baseline measures (n=4), not scheduling surgery (n=4), or other (n=9). Only 3 patients (ACU arm) withdrew during the study. In total, 100 patients (51 ACU; 49 TAU) completed the study. On average, ACU patients completed 3.8 acupuncture sessions (SD=1.1) out of an average length of stay of 4.7 days (SD=1.5).

Conclusions: Acupuncture was accepted by the large majority of eligible open-heart valve surgery patients. It was a feasible intervention during the post-operative hospitalization, including in the intensive care unit. Few patients withdrew from the acupuncture intervention. Future analyses will assess the impact of acupuncture on depressive symptoms, somatic sequelae, and atrial fibrillation in this population.

134) Abstract 1542

CARDIAC PATIENT'S RELIGIOUS STRUGGLE PREDICTS ACUTE STRESS DISORDER SYMPTOMS

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Background: ED visits have a multitude of psychological and spiritual implications for patients suspected of having an ACS event. Previous studies suggest that religious struggle is associated with the development and maintenance of PTSD symptoms after traumatic events, and with depression in heart failure patients. The assessment of religious struggle in a real-time clinical setting, immediately after

treatment for an acute life-threatening event is distinct and warrants investigation. We examined whether religious struggle immediately after a cardiac event was associated with concurrent Acute Stress Disorder Symptoms in response to the event.

Methods: The Reactions to Acute Care and Hospitalization (REACH; R01 HL117832) study is an observational cohort study of emergency department (ED) patients being evaluated and admitted for suspected acute coronary syndrome (ACS). Following their transfer from the ED, 774 patients completed the Brief Religious Coping questionnaire (RCOPE), which assesses religious struggle, and Acute Stress Disorder Scale (ASDS). ASD symptoms were regressed on demographic (age, sex) and clinical (Global Registry of Acute Coronary Events cardiac prognosis score and Charlson comorbidity score) covariates, and religious struggle variables.

Results: Participants were 53% men, age 60.8 ± 13.0 , and the mean ASDS score in the sample was 31.2 ± 12.7 . In the sample, 22% percent of participants reported at least some religious struggle. After adjustment for demographic and clinical covariates, each increase of 1 point in religious struggle was associated with a 3.25 point increase in ASDS score, $\beta = 0.24$, $p < .001$; model, $F(5, 769) = 13.9$, $p < .001$.

Conclusion: Cardiac patients' negative religious interpretations of their cardiac event were significantly associated with acute stress disorder symptoms in the first days after the cardiac event. Future research should determine whether religious struggle is a cause or consequence of distress in cardiac patients, and whether interventions targeting one can reduce the other.

135) Abstract 1009

A PILOT STUDY USING IMPEDANCE CARDIOGRAPHY (ICG) TO EXPLORE THE IMPACT OF RACIAL/ETHNIC MICROAGGRESSIONS ON THE ELECTRICAL CARDIAC FUNCTIONING OF LATINX PEOPLE

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Microaggressions — as a cumulative and chronic psychosocial stressor — may be a unique pathway in the development of cardiovascular diseases for Latinx. However, few studies exist exploring electrical functioning of the heart or impedance cardiography (ICG) during a racial/ethnic microaggression, including Left Ventricle Ejection Time (LVET), Stroke Volume (SV) Cardiac Output (CO), Thoracic impedance (Zo), Pre-ejection Period (PEP), Heart rate (HR), and change in impedance overtime (dZ/dt). Promising evidence exist demonstrating ICG reliably predicts the development of heart disease (DeMarzo, 2013).

Latinx students (N = 24) were recruited from a private Hispanic Serving Institution in Southern California. Participants were randomly assigned to one of three experimental manipulations: microinsult (n = 8), microinvalidation (n = 7), or control (n = 9). All participants underwent a baseline, manipulation and recovery period. Reactivity scores were calculated.

Participants were 18-33, first-generation, predominantly Mexican (72.7%), majority bilingual (60.6%), U.S.-born men (21.2%) and women (78.8%). At baseline, an omnibus One-way MANOVA showed no significant differences in conditions on ICG indicators, $F(14, 30) = .563$, $p = .872$; Wilks' $\Lambda = .627$, partial $\eta^2 = .208$. For the manipulation, an omnibus One-way MANCOVA (controlling for baseline ICG) demonstrated no significant differences in conditions on ICG indicators, $F(14, 16) = .869$, $p = .600$ Wilks' $\Lambda = .323$, partial $\eta^2 = .432$; however, there were non-significant trends towards higher reactivity for the microaggression conditions. During recovery, an omnibus One-way MANCOVA (controlling for baseline ICG) demonstrated no significant differences in conditions on ICG indicators, $F(14, 10) = .952$, $p = .546$; Wilks' $\Lambda = .184$, partial $\eta^2 =$

.571, with non-significant trends in higher reactivity for the microaggression conditions. Exploratory analyses showed baseline REMS subscale scores were differentially associated with ICG indicators throughout the experiment.

Data suggest our experimental manipulation of microaggressions produced non-significant ICG results; however, there were non-significant trends in ICG reactivity during racial/ethnic microaggressions. Moreover, self-report microaggression scores from the REMS were differentially related to ICG indicators throughout the experiment. Implications and limitations are discussed.

136) Abstract 1411

EXPLORING BLACK/ WHITE DIFFERENCES IN CARDIOVASCULAR HEALTH PRE-AND POST-SPOUSAL BEREAVEMENT

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Background: Bereavement is associated with excess risk of mortality, especially in the early weeks and months after a loss. However, the lack of representation of Black people in bereavement and grief research has led to a deficit in understanding of how the effects of grief may be different in this population. The current study assesses whether the cardiovascular effects of grief differ for Black individuals versus non-Hispanic Whites. **Methods:** We analyzed data from the Changing Lives of Older Couples (CLOC) study, a multi-wave prospective study of 1,532 married individuals recruited from Detroit, MI. Participants were all English speaking & aged 65 or older. The study included measures of grief, depression, and health. Systolic and diastolic blood pressure was also measured for a subset of the study participants. Time-points analyzed for the current study include baseline and W1(6-months post spousal loss). **Results:** Preliminary data analysis revealed that there was no significant difference between Black and White bereaved participants in overall grief severity [$t(248)=-1.59$, $CI=-0.364-0.378$, $p=0.11$]. Independent sample t-tests indicate significantly higher systolic blood pressure for Black participants at baseline [$t(417)=2.898$, $CI=3.21-16.76$, $p=0.0039$]. Mean systolic blood pressure at W1 was higher for Black participants but not statistically significant [$t(207)=1.8032$, $CI=-0.687-15.41$, $p=0.072$]. Similarly, Black participants had significantly higher mean diastolic blood pressure at baseline [$t(420)=3.5123$, $CI=2.88-10.21$, $p=0.00049$] and at W1 [$t(206)=3.42$, $CI=2.58-9.62$, $p=0.0074$]. A Pearson chi-square test of independence found at baseline [$X^2(1, N=1528)=20.06$, $p<0.0001$] and at W1 [$X^2(2, N=332)=8.26$, $p=.016$], the relationship between race and incidence of hypertension was significant. Black participants were more likely to have hypertension at baseline and W1. There was not a significant relationship between race and self-reported incidence of heart disease at baseline nor at W1. **Discussion:** These preliminary results suggest that although self-reported grief severity was not significantly higher for Black participants, there were still significant differences in pre and post-loss incidence of hypertension and blood pressure. Future analysis will assess differences in pre to post-loss changes in blood pressure, hypertension, and heart disease.

137) Abstract 1593

POSITIVE AND NEGATIVE AFFECT IN CARDIOVASCULAR REACTIVITY AND RECOVERY

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Background: Trait affect is an important predictor of health, with transient positive and negative emotional changes also considered

important pathways linking psychological stressors to disease. For example, past research has found anxiety and hostility to be associated with the development of cardiovascular diseases and illnesses due to hypertension, but these results are inconsistent. In our study, we examined blood pressure responses to the Trier Social Stress Test (TSST). We hypothesized that individuals with higher trait negative affect (NA) would have an overall higher blood pressure at all time points following the laboratory induced stressor and that the opposite would be true for those with high trait positive affect (PA).

Methods: Self-reported trait PA and NA was collected during the participant's initial visit as well as demographic information ($N=69$, 63.8% female, mean age = 33.5) At a second visit to the laboratory a week later, we utilized the TSST to induce acute stress. Blood pressure was measured every 90 seconds prior to, during, and following the task for 6 minutes. Bivariate correlations and linear regressions were utilized to examine the associations between affect and blood pressure. We controlled for demographic information as well as specific health behaviors. Reactivity was calculated by a difference score between baseline and trier averages. A difference score was also taken for recovery. This data is part of an ongoing study with a target $N=200$.

Results: Surprisingly, our results did not find connections between trait PA and NA with blood pressure reactivity. However, negative affect was positively correlated with blood pressure recovery ($r=.252$, $p=.031$) such that those with higher trait NA had more recovery.

Discussion: Although the association was unexpected, this study is ongoing, and it is possible that once we reach our target sample size, results will change. Alternatively, it may be that trait measures of affect taken one week prior to a stress task are less relevant than mood and state emotion measures taken immediately before a stressor. While trait affect is critical for long term health, it may be that when it comes to predicting acute stress responses, how we are reporting that we feel in the moment is what is more influential.

138) Abstract 1511

CAPTURING PSYCHOPHYSIOLOGICAL RESPONSES TO TRAUMA REMINDERS IN THE ACUTE AFTERMATH OF A STROKE TRAUMATIC EVENT

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Background: Stroke is the fifth leading cause of death in the United States, and 795,000 Americans will have a stroke in a given year. Stroke events can be terrifying medical experiences, and approximately one in four stroke survivors develop elevated posttraumatic stress disorder (PTSD) symptoms in response to the event. Psychophysiological reactivity in the acute aftermath of trauma predicts subsequent PTSD due to non-medical traumas. In this study, we examined correlates of patients' psychophysiological responses to trauma cues shortly after a stroke index trauma.

Methods: Participants presenting to the emergency department of an urban medical center with a stroke or transient ischemic attack (TIA) were enrolled in the REACH Stroke study, a cohort study of predictors of psychological and cardiovascular health outcomes after stroke/TIA. Among those hospitalized, 67 participants completed the PhenX Toolkit Trauma Challenge Physiology protocol for PTSD, in which skin conductance (SC) levels were recorded during a 2-minute resting baseline and a brief standardized trauma interview. SC was measured with the portable eSense SC system. Prior trauma history and acute posttraumatic stress symptoms were measured in-hospital with the Life Events Checklist and Acute Stress Disorder Scale, respectively. We examined demographic and trauma-related correlates of maximum SC reactivity to the trauma interview, relative to baseline.

Results: The analytic sample comprised 58 participants with useable SC data. Women had greater SC trauma reactivity ($M=1.53$, $SD=1.70$) than men ($M=0.59$, $SD=0.85$), $t(49.44)=-2.74$, $p=.008$. Greater

lifetime trauma burden was associated with greater SC reactivity to the stroke trauma, adjusting for gender ($b=0.28, p=.03$). However, acute posttraumatic stress symptoms in-hospital were not significantly related to SC reactivity when adjusting for gender ($b=0.12, p=.35$).

Conclusions: Greater lifetime trauma burden and female gender may be risk factors for exhibiting greater psychophysiological reactivity to the trauma of a stroke/TIA event. Follow up data will examine how elevated SC trauma reactivity relates to psychological and cardiovascular prognosis in these patients.

139) Abstract 1689

THE SHAM IN SHAME: STIGMA NEGATIVELY AFFECTS PATIENT CARE FOR TYPE-2 DIABETES AT THE INTERSECTIONS OF PATIENT IDENTITY

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Health disparities exist in type-2 diabetes (T2D) with higher rates among Black and Hispanic men and women relative to Asian and White men and women. Clinical guidelines for T2D have increasingly focused on weight in treatment, despite research suggesting that weight bias is widespread in healthcare and adversely affects patient care. Emerging research suggests T2D is also stigmatized, but it is unclear how diabetes stigma affects patient care or whether rates of diabetes stigma differ based on the intersectional identities of patients (i.e., patient's combined race and gender). This study documented differences in diabetes stigma as a function of patient race and gender, and examined the relationships among diabetes stigma, weight stigma, and diabetes care among patients with T2D. Patients with T2D ($N=1,210$), identified as Asian, Black, Hispanic or White, were approximately 52 years old, and had lived with T2D for an average of 9 years. Patients reported on experiences with weight stigma in healthcare, experiences with diabetes stigma (i.e., differential treatment by others, blame from others, and self-stigma), perceptions of doctor-patient communication about diabetes, self-efficacy for diabetes self-care, and diabetes-distress. Relative to Black women, Black men, and White men; White women reported more frequent weight stigma in healthcare, more frequent diabetes stigma (blame), and more diabetes self-stigma. Black women reported less frequent diabetes stigma (differential treatment) relative to Black men, White women, and White men. No other differences in stigma emerged as a function of patient's intersectional identities (race, gender). Regardless of race and gender, self-stigma for diabetes was negatively associated with doctor-patient communication about diabetes, negatively associated with self-efficacy for diabetes self-care, and positively associated with diabetes-distress. Weight stigma in healthcare was positively associated with diabetes-distress (e.g., more weight stigma, more distress) in both men and women, but the relationship between weight stigma and diabetes-distress was stronger among men relative to women (regardless of race). These findings suggest that stigmas (weight, diabetes) are negatively associated with patient care in diabetes, and more work on stigma is necessary to facilitate better care for patients with type-2 diabetes.

140) Abstract 1040

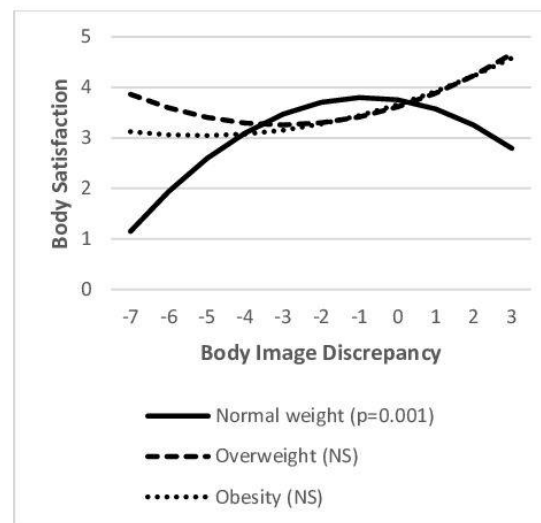
BODY MASS INDEX MODERATES THE ASSOCIATION BETWEEN BODY IMAGE DISCREPANCY AND BODY SATISFACTION AMONG MEXICAN AND PUERTO RICAN MEN

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Latinx men have high rates of overweight and obesity. Individuals with overweight/obesity may experience less body satisfaction, which is associated with negative psychosocial outcomes. Body image discrepancy, or the difference between one's perceived body and ideal body, is sometimes used as a proxy for body satisfaction; however,

little is known about the association between body image discrepancy and body satisfaction among individuals of Latinx descent and men in particular. **Method:** Participants were 203 men (mean age=39, $n=99$ Mexican, $n=104$ Puerto Rican) from the Latino Men's Health Initiative (R21CA143636, U54CA202995, U54CA202997, U54CA203000). Body image discrepancy was derived from the Figure Rating Scale with scores ranging from -8 (larger than ideal body) to 8 (smaller than ideal body). Body satisfaction was derived from the Body Areas Satisfaction Scale with scores ranging from 1 (very dissatisfied) to 5 (very satisfied). Body mass index (BMI) was calculated using objectively-measured height and weight. **Results:** The regression model controlling for ethnicity, age, education, marital status, and BMI revealed a significant quadratic association between body image discrepancy and body satisfaction ($\beta=-0.03, p=0.003$). Men with higher body image discrepancy had lower body satisfaction compared to those closer to their ideal body image. To test the moderating effect of BMI, a three-way interaction term (body image discrepancy² x BMI) was computed and entered into the model. This interaction was significant ($p<0.001$); thus, analyses were stratified by weight status. In stratified analyses, the quadratic association of body image discrepancy on body satisfaction was significant for those who had normal weight ($\beta = -0.07, p=0.001$) but not for those who had overweight ($p=0.26$) or obesity ($p=0.43$; Figure 1). **Conclusion:** Latinx men with a higher body image discrepancy are less satisfied with their bodies than those with lower body image discrepancy, but only when those men have normal weight. Further research is needed regarding the health implications of the body image discrepancy-body satisfaction relationship among Latinx men with normal weight. Moreover, future research should examine whether the lack of association between body image discrepancy and body satisfaction among Latinx men with overweight or obesity is related to weight-related behaviors.

Figure 1. Graph representing the association between body image discrepancy and body satisfaction among Mexican and Puerto Rican men stratified by weight status



141) Abstract 1657

THE SOCIAL NETWORK INFLUENCE ON OBESITY PREVALENCE: AN EXAMINATION OF MODEATORS IN A COMMUNITY SAMPLE

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A growing body of research suggests that the prevalence of obesity is influenced by social networks (SNs). Previous work (Cristakis & Fowler, 2007) suggests that relationship quality may moderate the extent to which one's SN member body size may influence one's own risk for obesity over time. Here, we additionally tested an alternative hypothesis, that the frequency of social contact may be an important moderator of social influences on body mass index (BMI) in a cross-sectional sample of 391 healthy, midlife adults (mean age=52.6 years, 77.5% white, 61.4% female). Participants reported up to 25 adult SN members with whom they have had regular contact ($M=18.1$, $SD=5.8$) and reported the following data for each SN member: body size using the Figure Rating Scale, health behavior supports, relationship type, and ranking of closeness. Additionally, over a 4-day monitoring period, participants completed hourly interviews about recent social interactions with these SN members using an electronic device during waking hours.

General linear models controlling for demographics (sex, age, race, education) and SN size showed that larger average SN body size was associated with elevated BMI in the participants ($b=0.97$, $p=.014$). Subgroup analyses of relationship types revealed elevated BMI associated with larger average body size of friends ($b=.67$, $p=.001$) and adult children ($b=1.35$, $p=.028$) in particular. Significant moderators of this relationship were shown by the extent to which participants' health behaviors were important to their friends ($b=.15$, $p<.001$) and children ($b=.15$, $p<.001$) as well as how engaged their friends ($b=.19$, $p<.001$) and children ($b=.30$, $p=.003$) were in the participants' health behaviors.

Although the frequency of social interactions with friends and adult children did not associate with BMI, increased social interactions with extended family members was associated with elevated BMI ($b=.33$, $p=.002$). Additionally, subgroup analyses of SN member rankings revealed that larger body sizes of SN members whose relationships were ranked most close were uniquely associated with increased BMI ($b=.57$, $p=.049$). These data suggest that both relationship closeness, and to some extent, frequency of contact may moderate the extent to which SN body size may be associated with obesity. Future research should consider close relationships in obesity risk.

142) Abstract 1276

RELATIONSHIPS BETWEEN PERCEIVED STRESS, DIETARY INTAKE AND OBESITY IN COLLEGE STUDENTS

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Background and Objective: Two in three American adults are obese or overweight. During young adulthood, there are many changes in lifestyle, especially with regard to dietary behaviors and greater exposure to stressors such as college. Historically, young adults are an understudied population. For this reason, the objective of this study is to explore the interrelationships between perceived stress, body fat percentage and dietary factors such as sugar, fat, and sodium intake.

Methods: Our measures were derived from the on-going Metabolism and Stress Assessment Lab pilot study that looks at young adults with a family history of Type 2 diabetes (target $n=100$). Perceived stress (PS) is measured by using the 10-item Perceived Stress Scale. The food frequency questionnaire is used to assess the frequency of high sugar meals and drinks, as well as intake of processed foods. The ASA-24 is used to collect dietary records on three days; data were then used to calculate the average values of dietary intake including sugar, fat, and sodium intake. Body fat percentage is measured by bioelectrical impedance (Tanita scale TBF-400). For the analysis, we ran Spearman's correlations and ANOVA to assess the relationship between PS and 1) frequency of consumption of sugar, fat, and sodium items, 2) average dietary intake of sugar, fat, and sodium intake, and 3) body fat percentage.

Results: In our current sample ($n=24$, age range: 18-25 years), PS was not related to average dietary intake of sugar, fat, and sodium, or body fat percentage. However, those who drank high sugary beverage intake

on a daily basis had a higher body fat percentage compared to those who consumed less frequently ($35.2\pm2.8\%$ vs. $24.6\pm2.0\%$, $p=0.02$).

Conclusion: These preliminary results show that sugary beverage consumption in young adults may be a correlate to obesity, which is an important factor in the development of metabolic disease. Furthermore, as our study progresses, we hope to further understand the role of stress to dietary intake and obesity.

143) Abstract 1458

SEX-DIFFERENCES IN BEHAVIORAL AND METABOLIC RESPONSES AFTER CHRONIC STRESS: A RODENT MODEL OF FEMALE SUSCEPTIBILITY

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Background: Exposure to repeated or prolonged stress during adolescence taxes adaptive and homeostatic processes leading to deleterious behavioral and metabolic outcomes. Although previous pre-clinical studies have found immediate and long-term effects of early life stress on cognitive function and stress hormone reactivity, these studies almost exclusively focused on males. The current study hypothesized that examining how chronic stress during adolescence affects behavioral and metabolic outcomes would reveal sex-differences in the biological basis of susceptibility.

Methods: During the late adolescent period (PND 40-60), male and female Sprague-Dawley rats were either subjected to a 20-day chronic variable stress paradigm (CVS; $n = 36/\text{sex}$) consisting of twice-daily heterotypic stressors or left undisturbed as handled controls ($n = 24/\text{sex}$). Following completion of CVS, all rats experienced a forced swim test (FST) followed 3 days later by a fasted glucose tolerance test (GTT). The FST was used as a behavioral test to determine coping strategy in response to a stressor.

Results: Within CVS, females exhibited significantly more passive coping as indicated by more time spent immobile than their male counterparts [$F(1, 116) = 32.06$, $p < 0.0001$]. Endocrine/metabolic function was evaluated in the GTT by measuring blood glucose levels and plasma corticosterone in response to an intraperitoneal glucose bolus. Within CVS, females had an accelerated stress response [$F(1, 115) = 6.00$, $p = 0.0158$] as corticosterone was elevated relative to males at baseline and 15 mins following glucose administration. Additionally, CVS impaired glucose clearance in females compared to males [$F(1, 115) = 11.53$, $p < 0.0001$] as peak glucose was higher at 15 mins leading to greater cumulative glucose exposure.

Conclusions: Collectively, these data indicate a sex-specific increase in susceptibility to the effects of chronic stress during the adolescent period as females adopted a more passive coping strategy in the FST, combined with greater stress hormone reactivity and delayed glucose clearance in the GTT. Altered behavioral and metabolic responses to acute challenges following adolescent stress may be indicative of emotional and homeostatic disruptions, possibly relevant to stress-related psychiatric and metabolic disorders.

144) Abstract 1131

MARITAL QUALITY AND INFLAMMATION: THE MODERATING ROLE OF EARLY LIFE ADVERSITY

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Objective: Although positive marital quality is usually associated with lower chronic low-grade inflammation, not everyone benefits equally from spousal support. Exposure to early life adversity (ELA)

has been proposed as one factor that may impede the social buffering effect of positive social relationships. The goal of this study was to test whether ELA would moderate the impact of marital quality on inflammation.

Methods: This cross-sectional study examined 168 partnered middle-aged women who either were experiencing a current chronic caregiving stressor, raising an adolescent with an autism spectrum disorder or intellectual disability, or who had the normative parenting experience of raising a typically-developing adolescent. Participants completed self-report questionnaires on marital satisfaction, dyadic coping, and perceived partner responsiveness to create a composite index of marital quality, and filled out the Childhood Trauma Questionnaire to assess ELA exposure. Participants also provided plasma samples for the assessment of interleukin-6, tumor necrosis factor- α , and C-reactive protein, three circulating biomarkers of inflammation.

Results: The main effect models indicated that ELA was associated with higher interleukin-6, chronic stress was related to higher tumor necrosis factor- α , and marital quality was marginally associated with lower tumor necrosis factor- α . However, there was significant interaction between ELA and marital quality. Specifically, ELA moderated the association between marital quality and inflammation. Among individuals who endorsed lower ELA exposure, there was a significant, negative association between marital quality and interleukin-6 and tumor necrosis factor- α levels. However, this association was attenuated and not statistically significant among participants who reported higher ELA exposure. This effect was independent of current chronic stress.

Conclusions: These findings suggest that ELA may impair the social buffering effect of marital quality on inflammation. This impaired social buffering effect may be another mechanism through which ELA promotes sustained elevations in inflammation over time.

145) Abstract 1529

CHILDHOOD ADVERSITY AND COMPLICATED BEREAVEMENT ARE INDEPENDENTLY RELATED TO PHYSICAL SYMPTOM SEVERITY

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Background: Physical symptoms (both explained and unexplained) are common in primary care and their perceived severity is determined by many biopsychosocial factors. Previous research has shown that childhood adversity and bereavement are associated with adult somatization. The objective of this study was to examine childhood adversity and bereavement as predictors of physical symptom severity.

Methods: Adult primary care patients ($N = 248$, 70% women) completed a cross-sectional survey using validated measures: Adverse Childhood Experiences survey (ACE, 10 categories of adversity), Brief Grief Questionnaire (bereavement), Patient Health Questionnaire Physical Symptoms (PHQ-15, symptom severity). A two-way ANOVA was conducted to test the effects of childhood adversity and bereavement on physical symptom severity.

Results: The mean age was 45. The majority of participants were white, married or common law, in very good health, with university education. Thirty-two percent of participants reported no important deaths, 57% reported resolved grief and 11% reported possible complicated grief. Sixty-four percent reported exposure to 2 types of ACEs while 36% reported ≥ 3 types of ACEs. There was a significant main effect of childhood adversity on symptom severity ($F(1, 227) = 17.71$, $p < .001$). There was also a significant main effect of bereavement on symptom severity ($F(2, 227) = 11.5$, $p < .001$). Although ACEs and complicated bereavement are related ($X^2 = 20.03$, $p < .001$), the effect of the interaction between childhood adversity and bereavement was not significant ($F(2, 227) = 6.55$, $p = .67$).

Conclusions: Childhood adversity and bereavement independently predict physical symptom severity. This study contributes to the understanding of psychosocial predictors of physical symptom severity in family medicine.

146) Abstract 1606

REPORTED FREQUENCY OF CHILDHOOD AESTHETIC EXPERIENCES: ASSOCIATIONS WITH OPENNESS TO EXPERIENCE AND STRESS RESILIENCE IN ADULTHOOD

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The personality factor Openness to Experience, particularly the Aesthetics facet, has been associated with adaptive cognitive, behavioral, and physiological responses to stress. Research suggests that individuals high in aesthetic sensitivity report a greater tendency to flexibly reframe and reappraise stressors as an opportunity for growth, strategies that may buffer the detrimental effects of stress. However, little is known about the developmental precursors to Openness. The current study examined the association between childhood exposure to aesthetic experiences and Openness in adulthood. In addition, the moderating effect of childhood aesthetic experiences (CAE) on the association between childhood trauma and self-rated health (SRH) and cognitive flexibility was examined. Participants were 174 adults ranging in age from 18 to 43 ($M = 20.71$, 22% male). Self-report measures included the NEO-PI-3, Childhood Trauma Questionnaire, Cognitive Flexibility Inventory, and SRH (overall health rating from poor to excellent). To assess CAE, participants rated the frequency with which they experienced art in childhood and were asked to provide examples. CAE was significantly correlated with adult levels of Openness ($r = .39$, $p < .001$). Further, results indicated that CAE moderated the association between childhood trauma and SRH ($B = .19$, $p < .05$): For individuals who reported low frequency of art exposure, childhood trauma was associated with poorer SRH ($B = .34$, $p < .001$), whereas there was no association among their higher frequency counterparts ($B = .07$, $p = .59$). CAE also moderated the association between childhood trauma and cognitive flexibility ($B = .15$, $p < .05$): Individuals reporting higher frequency of CAE evidenced a significant positive association between trauma and cognitive flexibility ($B = .23$, $p < .05$) whereas no association was observed among those reporting lower frequency. These findings suggest that childhood aesthetic experiences may play a key role in reducing the lasting impact of childhood trauma and fostering resilience. Notably, the most commonly cited examples provided by participants were school-based aesthetic exposure (e.g. art classes or field trips). Study findings add to our understanding of the developmental precursors to Openness to Experience and have implications for early intervention for childhood trauma.

147) Abstract 1214

SHAME AND SOCIAL STRESS-INDUCED CARDIOVASCULAR REACTIVITY AMONG AFRICAN AMERICAN WOMEN

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Shame is considered an emotional response to perceived social evaluative threats (i.e., circumstances that threatened one's self-esteem, social status and/or acceptance). Perceived threats that elicit shame are often a consequence of competing expectations and sociocultural interpretations of roles attributed to a given identity (e.g., gender, race). African American women are often ascribed stereotypes that provide negative racial and gender expectations. These stereotypes can induce shame among African American women via threats to personal self-esteem, status, and social acceptance. Shame has been strongly associated with an increased biological stress response particularly in studies examining social duress. However, few studies have investigated shame and stress reactivity in African American populations. The current study examined whether

cardiovascular reactivity (systolic and diastolic blood pressure) in response to the Trier Social Stress Test (TSST) differed among 18-22 year old African American women considered to have low shame (n = 11; M = 40.09, SD = 5.70) versus high shame (n = 13; M = 66.92, SD = 0.35). A general linear model was used to examine time and group effects of shame on cardiovascular reactivity patterns during six time points (baseline and 1 min, 15 min, 30 min, 45 min and 60 min post-TSST). Women in both categories demonstrated linear cardiovascular reactivity patterns suggesting systolic ($p=.005$) and diastolic blood ($p=.008$) pressure remained significantly higher than baseline following a one hour recovery period. Women in the high shame group showed greater diastolic blood pressure responses to the TSST than women with low shame, controlling for self-esteem ($p=.044$). These results highlight the need to further understand the psychobiological consequences of shame among African American women and subsequent health disparities in this population.

148) Abstract 1812
EXPLORING SHAME AND SHAME COPING ON IMMEDIATE DIASTOLIC BLOOD PRESSURE RESPONSES TO SOCIAL STRESS

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Background: Racism often informs racial and gender stereotypes, placing African American women outside of social norms. This increases African American women’s vulnerability to shame as racism threatens individual esteem and social status. Moreover, shame has been shown to heighten physiological stress responses in studies examining social distress (Gruenewald, Kemeny, Aziz, & Fahey, 2004). This prompts further inquiry into the impact of shame on biological stress responses as a potential mechanism for understanding health disparities among African American women. **Purpose:** The current study sought to examine the relationship between internalized shame and stress reactivity (i.e., diastolic blood pressure, [DBP]) immediately following exposure to the Trier Social Stress Test (TSST). Secondary analysis sought to investigate whether shame coping responses (i.e., withdrawal, attack other, attack self, avoidance) moderated the relationship between internalized shame and stress reactivity in this sample. **Method:** Twenty-two African-American women aged 18-22 completed the Internalized Shame Scale and the Compass of Shame Scale to assess internalized shame and shame coping style, respectively. Participants were then subjected to the TSST where immediate DBP responses were assessed at the conclusion of the TSST. **Results:** The relationship between internalized shame and Post-TSST DBP response was significant ($\beta = -.108, p=.023$), suggesting increased shame resulted in lower DBP Post- TSST. Secondary analyses revealed that the interaction of internalized shame and withdrawal significantly predicted DBP ($\beta = -.0208, p=.0009$). Similarly, the interaction between internalized shame and attack self shame coping significantly predicted DBP responses ($\beta = -.0208, p=.0009$). The interaction between shame and shame coping was similar across the aforementioned moderation models such that DBP remained consistent across low-high levels of internalized shame in participants who use moderate or high levels of withdrawal and attack self shame coping. **Implications:** These preliminary results necessitate examination of the mechanisms in which higher shame reduces immediate cardiovascular stress responses among African American women. These mechanisms should be examined in the context of shame coping style to further elucidate correlates of health disparities in this population.

149) Abstract 1005
VALIDATION OF THE LEVELS OF THE EMOTIONAL AWARENESS SCALE IN ARABIC (LEAS-AR)

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Background: Emotional awareness is the ability to express emotion in differentiated and complex ways and as a construct assists in identifying developmental differences relevant to symptom severity, treatment choice and outcome in medical and psychiatric conditions. The Levels of Emotional Awareness Scale (LEAS) is a written performance measure that scores the number and complexity of emotion words in response to 20 interpersonal vignettes. Despite strong validity and predictive utility in North American, European and Japanese samples, its validity in Non-Western cultures is still in need of examination. The goal of this study is to examine the LEAS-Ar’s reliability and validity.

Methods: 155 participants (aged 18-64; 96 female) completed the LEAS-Ar translated and back-translated from English and adapted for Palestinian-Arab citizens of Israel. The LEAS-Ar validity study used standardized questionnaires of related constructs (The 20-Item Toronto Alexithymia Scale (TAS20), Perception of Affect Task, Positive Affect and Negative Affect scales, Blatt’s Object Relations Inventory (parental descriptions), the mental state stories and demographics).

Results: Positive LEAS-Ar correlations with conceptual level and false beliefs (mental state stories), positive mood, emotion recognition, and Blatt’s parental description were consistent with those in other validation studies. The mean scores of total LEAS-Ar in Israel (65.1 ± 13.9) were significantly higher than those reported in English in the USA (61.9 ± 10.7); $t(540)=2.87, p = 0.0042$. The total LEAS-Ar scale was Cronbach $\alpha=0.934$. Women (67.9 ± 12.1) scored significantly higher than men (60.4 ± 15.4); $t(153) = 3.36, p = 0.0010$. Mean LEAS-Ar was higher with higher education (BA, MA, PhD) (70.3 ± 8.3) vs. high school education or less (59.4 ± 16.4); $t(147) = 4.48, p = 0.0001$, and with higher socioeconomic status (SES) (68.6 ± 9.9); ($F_{(2,152)}=4.086, p<0.05, \text{Eta Squared } \eta^2=0.51$) vs. lower SES (60.4 ± 14.7).

Conclusions: Valid assessment of LEAS can be conducted in Arabic. To assess the veracity of higher LEAS-Ar, cross-language reliability with established gold-standard ratings is needed. Higher LEAS scores associated with gender, education and SES are consistent cross-culturally. The validation of the LEAS-Ar will enable it’s use with Arabs in Israel, contributing to the study of health equity in this underserved population.

Table 1. Correlations of LEAS-Ar with other study variables

	4	5	6	7	8	9	10	11	12
1	.429**	0.032	0.113	0.108	-0.159	.357**	0.066	.236**	.298**
2	.445**	0.030	0.103	0.051	-0.148	.347**	0.044	.203*	.290**
3	.465**	0.016	0.101	0.073	-.162*	.388**	0.041	.247**	.296**

* $p \leq .05$ ** $p \leq .005$ / 1= Emotional awareness of self; 2= Emotional awareness of others; 3= Emotional awareness total score; 4= Mental state stories; 5= Alexithymia general; 6= Difficulty describing feelings; 7= Difficulty identifying feelings; 8= Externally oriented thinking; 9=Positive mood; 10= Negative mood; 11 = Emotion Recognition;12= Blatt’s parental description.

150) Abstract 1753
PHYSICAL ACTIVITY, AIR POLLUTION AND HEALTH: THE NEUROCOGNITIVE AND BRAIN IMAGING PROTOCOL IN THE 4HAIE STUDY

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Background: Air pollution has been linked to increased mortality and morbidity. Physical activity, specifically running, is beneficial for health and reduces a risk of cancer, cardiovascular, metabolic,

musculoskeletal, mental and neurodegenerative diseases. Whether physical activity is health protective in a highly polluted region is unknown. The 4HAIE aims to assess the effect of air pollution on various health outcomes and quality of life. Herein we introduce the neuroimaging protocol and cognitive assessment designed to investigate cognitive and brain health in the 4HAIE cohort.

Methods/Design: A total of 1,500 persons aged 18-65 will be recruited. Of these, 750 physically active/inactive persons living in a highly-polluted region and 750 physically active/inactive persons from a low-pollution level control region. Participants are screened by online questionnaires and undergo 2 days of laboratory assessments including biomechanical, physiological, psychological testing and imaging. Data collection started 2019 and will be completed by 2021. Each participant recruited for the study undergoes structural brain imaging using 1.5T Siemens Magnetom Semptra Scanner with a 16-channel receive head coil. MRI sequences include high-resolution T1-weighted primarily used to study grey matter structural macroscopic tissue in both cortical and subcortical brain regions. Neurocognitive battery includes standardized tests of memory and executive functioning including verbal fluency, inhibitory control, cognitive flexibility and working memory.

Discussion: The integration of MRI techniques and cognitive assessment in combination with data on social, behavioural, biological and environmental variables from a well-designed cohort study will provide a unique opportunity to examine brain structure and cognitive function in relation to health behaviour, air pollution and other factors affecting resilience against and vulnerability to adverse brain changes and cognitive aging.

Data collection is underway

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151) Abstract 1026

IMPORTANCE OF ALEXITHYMIA AND ANGER FOR SUICIDE ATTEMPTS IN PSYCHOSOMATIC PATIENTS

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There is evidence that difficulties in affective differentiation and expression may be relevant for suicidal behavior. However, there is little research that more accurately captures the extent of connectivity. In our study we analysed the relationship between alexithymia, dealing with anger and lifetime suicide attempts in psychosomatic patients. We examined 1238 outpatients (age 36.5 ± 14.5 years, 31% men) at the Psychosomatic Department of University Hospital Bonn by means of a clinical interview, a sociodemographic questionnaire, the state-trait-anger inventory (STAXI), the toronto alexithymia scale, (TAS-20), and the patient health questionnaire (PHQ-9).

Patients with (N=215) versus without (N=1023) lifetime suicide attempts were significantly more often female (74,5% vs. 68,3%; $p=0.039$) without partnership (51,5% vs. 44%; $p=0.025$), had lower formal education (A levels in 26,9% vs. 38%; $p<0.001$), suffered more frequently from current major depression (82,2% vs. 75%; $p=0.009$), eating disorder (32,1% vs. 24%; $p=0.004$), posttraumatic stress disorder (21,3% vs. 11,7%; $p<0.001$), substance-related disorder (10,1% vs 5,3%; $p<0.001$), or personality disorder (28,9% vs. 11,9%; $p<0.001$). Analysis of Covariance with covariates sex and depression (PHQ-9) found significantly higher scores in lifetime suicide attempters for the three alexithymia subscales difficulties identifying feelings ($p<0.001$), difficulties describing feelings ($p<0.001$), externally-oriented thinking ($p=0.001$). Moreover, suicide attempters showed higher state-anger ($p<0.001$), trait-anger ($p=0.001$), anger-suppression ($p=0.001$), anger-out ($p<0.001$) and anger-control ($p=0.011$).

The study confirms more difficulties in affective differentiation and expression in lifetime suicide attempters. Particularly the experience and expression of anger in suicidality should be more focused in future studies in order to optimize diagnostics and therapy.

152) Abstract 1616

MATERNAL ACCULTURATION AND INFANT EMOTION REGULATION ON PRESCHOOL AGE PSYCHOPATHOLOGY

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Emotion regulation problems that are present in infancy have been found to be predictive of negative childhood developmental outcomes. Parental stressors have also been linked to negative developmental outcomes in children and some populations are at higher risk of experiencing this phenomenon. Mexican-American women are at a higher risk of experiencing stressors due to added socio-cultural factors such as acculturation, the assimilation to a new culture, and acculturative stress, which is the impact experienced as a result of adapting to a new culture. This study aimed at determining whether negative emotionality in infants, 6 months of age, was predictive of preschool age psychopathology as well as whether maternal socio-cultural factors influenced the relationship between early infant affect and outcomes in later childhood. Forty-three Mexican-American mother-child dyads participated in a Still-Face procedure when their infants were 6 months old in order to assess the infant's emotional regulation through observing the intensity and frequency of negative vocalizations. Questionnaires to determine mothers' level of acculturation and maternal reports of infants' negative affect were also completed during this visit. Mothers returned to participate when their child was 3 and a half to 5 years old and completed the Child Behavior Checklist (CBCL) to assess for emotional and behavioral problems. While our results did not show that early infant negative emotionality was a significant predictor of preschool age emotional and behavioral problems ($R^2 = .05$, $F(1, 40) = 2.127$, $p = .153$), we did find that maternal acculturation was a significant moderator on infant negative affect and later emotional reactivity. Specifically, mothers who demonstrated higher acculturation and reported higher negative affect in their infants had higher reports of emotional reactivity in their preschool age children ($R^2 = 0.1324$, $B = 1.869$, $SE = 0.7175$, $t = 2.6049$, $p = 0.0129$). These findings suggest that higher acculturation could potentially serve as a risk factor for increased negative emotionality throughout development.

153) Abstract 1015

EXAMINING THE IMPACT OF AN EXPERIMENTAL MANIPULATION OF WORRY AND RELAXATION ON INFLAMMATORY CYTOKINES

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The perseverative cognition hypothesis (PCH) suggests worry may prolong the physiological stress response and increase risk for long-term health issues and this risk may be increased for people who experience anxiety and/or depression symptoms. This study tested the impact of experimentally induced worry and relaxation on inflammation. Participants (N = 85) were community members from a large urban area. Following a baseline period, all participants completed a worry and relaxation induction. The worry condition preceded the relaxation condition to test whether worry contributed to physiological and immune dysregulation and whether relaxation subsequently contributed to a return to baseline physical functioning. Blood was drawn at baseline and after the experimental conditions to test for inflammatory cytokines (TNF- α , IL-6, IFN- γ). Participants also completed self-report measures of depression and trait anxiety to examine psychological moderators of inflammatory change. Results indicated significant changes in IL-6 ($p<.001$) and IFN- γ ($p<.001$) throughout the study conditions. There was no significant change in

TNF- α ($p=.19$). IFN- γ increased significantly from baseline to worry and then decreased following relaxation, indicating that this brief experimentally-induced period of relaxation had an ameliorating impact on IFN- γ dysregulation. IL-6 did not change significantly between baseline and worry ($p=0.20$). However, there was a significant difference between worry and relaxation ($p<0.001$) with IL-6 continuing to increase throughout the relaxation condition. Trait anxiety did not moderate these findings while the depression*condition quadratic effect was significant for IL-6 ($p<.01$) and trending for TNF- α ($p=.08$). The pattern of change for both markers showed that people low in depressive symptoms were closer to baseline inflammatory levels after relaxation whereas those higher in depressive symptoms had higher inflammation across both conditions. Overall, these findings highlight the importance of understanding how worry may negatively impact immune function and the potential for relaxation to alter the course of this impact. Future research should continue to examine psychological symptoms that may affect the trajectory of worry and relaxation on immune function to better intervene on this relationship at both the psychological and physiological levels.

154) Abstract 1664

STRESS IN VIRTUAL ENVIRONMENTS: CORTISOL AND AUTONOMIC NERVOUS SYSTEM RESPONSES TO NOVEL VIRTUAL STRESS TASKS

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Background:

The Trier Social Stress Test (TSST) is the gold standard in stress reactivity research. However, only 50-70% of participants in the TSST show a cortisol response, indicating the TSST is not stressful for everyone. We hypothesize that virtual reality stress tasks will elicit a stress response, measured by levels of cortisol and autonomic nervous system reactivity.

Methods:

Three different virtual reality tasks were programmed in C# language and implemented with Unity. For the first study N=26 participants were exposed to virtual simulated height while performing a mental math task and balancing on a walking plank. The second study consisted of a task with zombies, a task in a burning house and a climbing task, completed by N=23 participants. The third study (N=18 participants) was a virtual dance competition involving dancing in front of a virtual audience. Ambulatory EKG data and saliva samples through passive drooling were collected and analyzed in repeated measures ANOVA.

Results:

In study 1, 2 and 3 there was significant autonomic nervous system reactivity. Heart rate significantly increased in response to the stress task in study 1 ($F(7,77) = 17, p < 0.0001$), study 2 ($F(1,17) = 38.14, p < 0.0001$) and study 3 ($F(14,210) = 2.052, p = 0.016$). Cortisol levels significantly increased over time in study 1 ($F(2,46) = 4.857, p = 0.03$), in responders in study 2 ($F(2,28) = 10.320, p < 0.0001$) and in responders in study 3 ($F(5,75) = 2.796, p = 0.02$). The percentage of cortisol responders was 69% in study 1, 65% in study 2 and 89% in study 3.

Conclusion: Virtual reality stress tasks elicit a stress response. Participants showed autonomic nervous system reactivity and a cortisol response to 3 different types of virtual stress tasks. The percentage of cortisol responders was especially high in the third study, indicating a virtual dance competition may be especially stressful in virtual reality.

155) Abstract 1410

PRIMARY CARE PATIENTS WHO ARE VERY BOTHERED BY MORE THAN ONE PHYSICAL SYMPTOM HAVE A HIGH LIKELIHOOD OF EXPERIENCING HEALTH CONSEQUENCES OF CHILDHOOD ADVERSITY

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Adverse childhood experiences (ACEs) are associated with physical illnesses, symptoms, health anxiety, distress, and impaired function, yet primary care patients are often not asked about ACEs. Family doctors who don't routinely screen for ACEs might screen the subgroup who are most likely to have experienced health consequences of ACEs. We tested if physical symptoms could identify this higher-risk group. **Method:** 233 primary care patients were surveyed about perceived health, ACEs, physical symptoms (PHQ15), and impaired function (WHODAS). The number of severe PHQ15 symptoms ("bothered a lot" by it in the last 4 weeks) was counted. Three criteria of severe symptom multiplicity were defined: any severe symptoms, ≥ 2 severe symptoms, ≥ 3 severe symptoms. For each criterion we tested the sensitivity (SENS) and negative predictive value (NPV) of this marker with respect to two markers of health consequences of ACEs: ACE score ≥ 3 AND perceived health < very good; ACE score ≥ 3 AND WHODAS in the highest tercile. **Results:** Exposure to 10 types of ACEs was: zero-31%, one-28%, two-16%, three-10%, four or more-15%. Combined high ACE score (≥ 3) and health consequences were present in 13% (perceived health < very good) or 16% (impaired function). Any severe symptoms occurred in 59% of patients and identified patients with health consequences of ACEs with 97% SENS and 99% NPV (perceived health or impaired function). Multiple severe symptoms (≥ 2) occurred in 35% of patients and identified patients with health consequences of ACEs with 73% SENS and 95% NPV (perceived health) or 75% SENS and 94% NPV (impaired function). Three or more severe symptoms occurred in 20% of patients and identified patients with health consequences of ACEs with 57% SENS and 93% NPV (perceived health) or 58% SENS and 92% NPV (impaired function). **Discussion:** The optimal threshold of severe physical symptoms to identify likely health consequences of ACEs in this cohort was 2 or more symptoms. One or more severe symptom occurs too frequently to be a useful criterion. Three or more symptoms had the highest specificity (not shown) but lacked sensitivity. Identifying patients who are "bothered a lot" by 2 or more physical symptoms (whether or not they are explained by disease) is straightforward and may identify patients for whom discussion of ACEs is most relevant to practicing trauma-informed care.

156) Abstract 1852

ASSOCIATIONS OF PERCEIVED WEIGHT DISCRIMINATION WITH MENTAL AND PHYSICAL HEALTH AND MEDIATING EFFECTS OF HEALTH BEHAVIOURS AND STRESS

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Objective: To examine cross-sectional and prospective associations between perceived weight discrimination and health and wellbeing, and test for mediation by unhealthy behaviours and stress exposure.

Methods: Data were from 4,341 adults with a body mass index (BMI) $\geq 25\text{kg/m}^2$ participating in the English Longitudinal Study of Ageing. Regression models tested cross-sectional and prospective associations between perceived weight discrimination at baseline (2010/11) and

self-rated health, limiting long-standing illness, depressive symptoms, quality of life, and life satisfaction over four-year follow-up (2010/11–2014/15). Mediation analyses tested the role of smoking, physical inactivity, alcohol consumption, and stress exposure (assessed using hair cortisol concentrations) in the associations between perceived weight discrimination and health and wellbeing outcomes. Analyses adjusted for age, sex, ethnicity, wealth, and BMI.

Results: Cross-sectionally, perceived weight discrimination was associated with significantly higher odds of fair/poor self-rated health (Odds ratio (OR)=2.05, 95% Confidence Interval (CI) 1.49–2.82), limiting long-standing illness (OR=1.76, 95% CI 1.29–2.41) and depressive symptoms (OR=2.01, 95% CI 1.41–2.85), and lower mean ratings of quality of life ($B=-5.82$, 95% CI -7.01 to -4.62) and life satisfaction ($B=-2.36$, 95% CI -3.25 to -1.47). Prospectively, perceived weight discrimination was associated with significantly higher odds of fair/poor self-rated health (OR=1.63, 95% CI 1.10–2.40) and depressive symptoms (OR=2.37, 95% CI 1.57–3.60) after adjustment for baseline status. Those who perceived weight discrimination had significantly higher odds of being physically inactive (OR=1.90, 95% CI 1.18–3.05) and higher hair cortisol concentrations ($B=0.14$, 95% CI 0.03–0.25) than those who did not perceive discrimination. There was only non-significant weak evidence that these variables mediated associations between perceived weight discrimination and poor health and wellbeing.

Interpretation: People who experience perceived weight discrimination have poorer health and wellbeing than those who do not. While perceived weight discrimination is associated with physical inactivity and greater exposure to stress, these variables explain only a small part of the association between perceived weight discrimination and poorer health and wellbeing.

157) Abstract 1261

PSYCHOSOMATIC STRESS AWARENESS: HOW STRESS-RELATED SOMATIC SENSATIONS AND SYMPTOMS AFFECT THE PROCESS OF COPING WITH STRESS

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Introduction: Stressful situations are a common and recurring phenomenon in almost everyone's life. Beyond emotional, cognitive, and physiological reactions, the experience of stress is often associated with the perception of stress-related somatic sensations and symptoms (SRSSS), such as tension, restlessness, headache, or nausea. This body involvement does not express a pathological process, but instead reflects the strong psychosomatic nature of stress. However, despite the strong psychosomatic component of stress, coping with stress has so far been predominately examined as a cognitive-behavioral process. As a result, it is currently unclear to what extent the subjective awareness of SRSSS is relevant for coping. The model of psychosomatic stress awareness (PSA) fills this gap by entailing the idea that SRSSS may be both beneficial and cumbersome for the process of coping by affecting an individual's cognition, emotion, behavior, and needs. It was the aim of this study to a) test the PSA model and b) to validate the newly developed psychosomatic stress awareness questionnaire (PSAQ).

Methods: An item-pool of 31 items, consisting of items about (1) the subjective perception of SRSSS and (2) about beneficial and cumbersome ways how SRSSS could affect coping, was administered to $N = 260$ participants via an online survey. For conceptual validation, several established questionnaires were included. Data analysis included exploratory and confirmatory factor analysis using structural equation modeling.

Results: Results will be presented at the conference for the first time. We expect empirical confirmation for the PSA model (e.g., two-factor structure) as well as the successful validation of the PSAQ.

Conclusion: The proposed PSA model allows a new perspective on SRSSS as well as on the process of coping by strengthening the previously neglected psychosomatic perspective. Moreover, it offers

the possibility to examine both the salutogenic and detrimental effects of SRSSS. Embedding the PSA model into a broader theoretical framework of established constructs emphasizes its scientific significance and promising role for future research.

158) Abstract 1107

ARE COMPARISONS ALWAYS WRONG? THE EFFECT OF FRAMES OF REFERENCE ON SELF-REPORT MEASURES

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Background.

Self-report measures concerning life satisfaction, health status and behaviors, and current life conditions are frequently used in well-being research and clinical trials. However, the validity of self-report responses can be affected by many factors, including comparison standards that people use when responding to survey questions, also called frames of reference (FoRs). The effects of FoRs on self-report might be the strongest for items which use vague quantifier (VQ) scales as response options (rather than numeric response), which are particularly prominent in well-being research. This study aims to further investigate the impact of FoRs on self-report measures by examining how imposing a specific FoR affects (a) the response levels of VQs and (b) the relationship between VQs and a quantitative measure of the same outcome.

Methods.

A sample of 1869 respondents recruited via MTurk completed a set of questions concerning their health, satisfaction with life, pain, fatigue, sleep, and medication use. They were randomly assigned to the FoR manipulation groups and were asked to compare themselves with the average US adult (US Adult), with their friends who are about their age (Friends) or did not receive specific instructions (control). Control group was asked which FoRs they used. Sleep and the use of medication was assessed with both VQ and numeric response.

Results.

FoR manipulation affected the responses to pain and fatigue questions, such that pain was rated as higher in the FoR:Friends condition and fatigue was higher in both FoR groups compared to the control group. Responses to other questions did not differ between conditions. The association between the numeric responses and VQs was comparable across different FoR conditions for sleep and medication use. In the control group, respondents most often reported comparing themselves with the average US adult (30-54%) or used no comparison standard (18-57%).

Conclusions.

Inducing FoRs had limited effect on the responses, which suggests that at least some comparisons do not have a strong biasing effect on self-report measures of well-being. However, future research should confirm this finding for using stronger manipulations as well as other FoRs not examined in this study (e.g., historical or hypothetical comparisons).

159) Abstract 1695

STRENGTH TRAINING FOR STRESS REDUCTION: THE ROLE OF BODY MINDFULNESS

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Introduction: Many well-established stress reduction programs such as yoga, progressive muscle relaxation, or Nordic Walking typically include either relaxation or activity elements which both activate the hypothalamic-pituitary-adrenal (HPA) axis. In recent years, mindfulness-based methods have also become more and more important. In this study, we investigated whether strength training is also suitable for stress reduction and whether this is associated with

body mindfulness, i.e. with directing attention to the parts of the body being trained.

Methods: $N = 51$ healthy men participated (mean age: 23.1 ± 2.9 years, BMI: 23.8 ± 1.8 kg/m²). All have been doing strength training at least three times a week for at least six months. They performed a standardized strength training, consisting of 5 exercises à 4 sets à 10 repetitions each. Salivary cortisol was measured before, during, after, and 20 minutes after the training. Body mindfulness was assessed by means of the State Mindfulness of Body Scale (SMS-B) and two additional items. Furthermore, the Positive and Negative Affect Schedule (PANAS) was filled out by the participants before and immediately after the training.

Results: Cortisol levels were significantly lower ($p = .001$) and positive affect was significantly higher ($p = .001$) after the training than before. Furthermore, a trend towards lower negative affect after the training was found ($p = .07$). Body mindfulness during the training was positively related to the increase in positive affect ($r = .29, p = .04$). No association between body mindfulness and the cortisol time course was found.

Discussion: We have shown that strength training can be an alternative to other stress reduction programs. Although body mindfulness was not related to HPA axis activity, it supported the positive changes in the participant's mood. However, it should be noted that our sample was healthy and highly motivated. Therefore, our design should be extended to other populations (e.g., women, chronically stressed people, and novices). Furthermore, motivational factors should be evaluated in future research. We conclude that strength training, especially when performed with high levels of body mindfulness, can be a good way to improve mood and reduce HPA axis activity.

160) Abstract 1480

SLEEP, ACTIVITY, AND NUTRITION AMONG AN ARMY HEALTH INTERVENTION SAMPLE: STRENGTHS, DEFICITS, AND DIFFERENCES BASED ON GENDER AND RANK

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Habits and behaviors related to sleep, activity, and nutrition (SAN) are key components in overall health and well-being. An individual's knowledge about and self-confidence to engage in healthy SAN behaviors can have an impact on their actions, and can differ among groups. Promoting health and well-being among Soldiers is a large focus of U.S. Army leadership; as such, a recent multicomponent pilot health promotion program and initiative centered around healthy SAN was developed and launched in five brigades at multiple locations. The pilot encouraged healthy SAN behaviors through a variety of program activities, including weekly small-group education, communication materials (e.g., guide books, posters), and SAN-relevant content on social media outlets. These activities were designed to support Soldiers' health knowledge and self-confidence to achieve healthy SAN behaviors. Baseline data from 11,485 participating Soldiers revealed differences based on gender and rank among several of the seven SAN behaviors evaluated: workweek and weekend sleep, caffeine consumption, aerobic exercise, resistance training, fruit/vegetable consumption, and refueling with a healthy snack 30 to 60 minutes after exercise. Knowledge was significantly correlated to 5 of the 7 behaviors (Pearson's correlations ranging from .03 to -.103, $p < .001$) and self-confidence was significantly correlated to all 7 behaviors (Pearson's correlations ranging from .086 to .370, $p < .001$). Men reported more adjusted aerobic exercise minutes ($d = .48$) and more resistance training days ($d = .34$) per week than women. Officers reported greater self-confidence in their ability to refuel after

exercising ($d = .38$), more frequent refueling behaviors ($d = .43$), greater activity knowledge, as well as greater self-confidence in their ability to achieve activity goals (d ranging from .33 to .39), compared to enlisted Soldiers. Baseline data support the need for intervention to promote healthy SAN behaviors focusing on building self-confidence rather than knowledge, and also highlights potential health disparities among different demographic groups of Army Soldiers with a possible need to tailor interventions to address these observed group differences.

161) Abstract 1613

CHILDHOOD LEVELS OF OPTIMISM LINKED TO ADULT PHYSICAL ACTIVITY PARTICIPATION

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Background

Physical activity is a key behavior for maintaining a healthy lifestyle and preventing age-related diseases. As individuals age, however, participation in physical activity tends to decline. Thus, it is important to determine factors that promote the maintenance of physical activity across the lifespan. Optimism may be one factor as research has shown that *adults* with higher levels of optimism tend to engage in more physical activity than those who are less optimistic. However, substantially less is known if optimism in childhood is longitudinally associated with physical activity in adulthood. We hypothesized that children with higher levels of optimism would participate in more physical activity in adulthood compared to their less optimistic peers.

Methods

Data were from the 1958 British Birth Cohort, a longitudinal study in which 11-year-old participants wrote about how they imagined their life would be at age 25. Essays were each coded by two raters for the presence of psychosocial resources, including optimism. Physical activity was self-reported at age 33 by asking participants if they regularly participated in any of 11 specific activities (e.g., running, cycling) and, if so, how often they took part in any of the activities. The original response categories were recoded into four physical activity frequency categories: rarely, low frequency, medium frequency, and high frequency. Ordinal logistic regression analyses determined the association between childhood optimism and frequency of physical activity in adulthood. Models were unadjusted and then statistically controlled for sex, child financial hardship, and child cognitive ability.

Results

In the unadjusted model ($N = 5,219$), higher levels of childhood optimism were significantly associated with greater physical activity in adulthood ($b = .05$, 95% CI = .002, .10). In the fully-adjusted model ($N = 4,708$), the association persisted but did not remain statistically significant ($b = .05$, 95% CI = -.005, .10).

Conclusions

This study is one of the first of its kind to suggest that childhood optimism may serve as a predictor of physical activity participation in adulthood. Early-life interventions focusing on strengthening psychosocial resources, such as optimism, may be beneficial for creating a foundation for the maintenance of physical activity throughout adulthood.

162) Abstract 1191

PHYSICAL ACTIVITY AND AFFECT VARIABILITY: DIFFERENTIAL ASSOCIATIONS FOR POSITIVE VERSUS NEGATIVE AFFECT

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Introduction: High levels of affective variability (i.e. within-person fluctuation in positive or negative affect across occasions) have been linked to poorer indicators of mental and physical health. It has been argued that physical activity might benefit well-being through facilitating stable levels of affect (Bernstein, Curtiss, Wu, Barreira &

McNally, 2018). We used pilot data from an ecological momentary assessment study to examine links between physical activity (indicated by the number of steps measured by actigraphy) and variability of positive and negative affect.

Method: Over a one-week period, 21 university students wore physical activity monitors and completed four short surveys each day on their smartphones. Positive and Negative Affect were measured by asking participants how much they felt a specific emotion (e.g. anxious, sad, enthusiastic, happy). We used multilevel modeling to examine links at the within-person level (i.e. are days with more steps compared to days with fewer steps associated with more/less affective variability?) and at the between-person level (i.e. do more physically active people differ from less physically active people in their affective variability)?

Results: Participants walked 8890 steps daily on average ($SD = 3101$). Within persons, number of steps was not associated with either positive or negative same-day affective variability. However, between-persons, people who walked more on average exhibited less variability in their positive affect ($p = .021$) but marginally more variability in their negative affect ($p = .067$). These results persisted after accounting for the participant's average levels of daily positive and negative affect.

Implications: Physical activity might be associated with more stable or less variable positive affect, but not negative affect. Perhaps active lifestyles may promote maintenance of positive affect, and may enable one to be more responsive to environmental demands, as indicated by higher negative affective variability. The findings support the importance of considering health behaviors, particularly physical activity, as potential influences on affect dynamics. We plan to examine whether these associations replicate in a larger community-based sample of adults.

163) Abstract 1454

PHYSICAL ACTIVITY AND SELF-EFFICACY IN ETHNICALLY DIVERSE MIDDLE SCHOOL AGED GIRLS

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Introduction: While low social support and environmental and situational barriers can impede physical activity, self-efficacy is known to facilitate physical activity. Little, however, is known about how self-efficacy interacts with these constructs to affect physical activity. To this end, we examined the relationship between physical activity levels and self-efficacy for 'seeking support' and 'overcoming barriers' to physical activity in ethnically diverse middle school girls.

Methods: The girls ($N = 335$, 11.8 ± 0.9 years old, 92.5% minorities) were participants in a study to promote healthy lifestyle. Parents reported their years of education (Mothers: $M = 15.1$, Fathers: $M = 13.9$), and girls rated their physical activity level as "not active (1.9%), somewhat active (25.3%), active (45.6%), or very active (27.2%).” Girls completed Saunders' Self-Efficacy Scale, which included subscales that assess self-efficacy for physical activity 'support seeking' (7 items) and for 'overcoming barriers' (4 items).

Results: Linear regression models showed a significant positive association between child physical activity levels and 'support seeking' self-efficacy ($R^2 = .117$, $F = 8.56$, $p < .001$), and 'overcoming barriers' self-efficacy ($R^2 = .129$, $F = 9.56$, $p < .001$), controlling for maternal and paternal education. Self-rated physical activity accounted for significant variability in 'support seeking' self-efficacy ($\beta = 0.308$, $t = 5.8$, $p < .001$) which increased by .48 for every increase in activity level. Physical activity accounted for significant variability in 'overcoming barriers' self-efficacy ($\beta = 0.349$, $t = 6.6$, $p < .001$) which increased by .65 for every increase in activity level. The findings suggest that physical activity is positively associated with girls' self-efficacy for seeking support as well as for overcoming environmental and situational barriers.

Conclusion: Engaging in inadequate levels of physical activity is a major risk factor for childhood obesity. These results underscore the need to address social support and barriers to participation in physical

activity in ethnically diverse communities to reduce obesity risk. Parents can be leveraged in obesity prevention interventions to improve self-efficacy by providing support and identifying and addressing barriers to physical activity before related issues arise.

164) Abstract 1081

ARTIFICIAL INTELLIGENCE TO UNDERSTAND THE JOURNEY OF HISPANICS/LATINOS DEALING WITH DEPRESSION: THE VALUE OF DIGITAL CONVERSATIONS

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Background: The lifetime prevalence rate for major depression was reported to be 20.1% for Puerto Ricans, 18.6% for Cubans, 14.7% for Mexicans, and 13.9% for other Latinos. Not only are language issues recognized as a barrier to treatment, but cultural beliefs and practices influence the experience of depression and thus can moderate the effectiveness of prevention and treatment interventions. Artificial Intelligence (AI)-based research methods could be highly beneficial to investigate cultural barriers hispanics/latinos face accessing depression treatment

Objectives: This is the first-time advanced AI tools are used to better understand the digital voice of the Hispanics patient and their relationship to depression.

Methods: We analyzed 12 months of digital discussions about depression to identify barriers that correlate to dealing with depression and seeking help and/or treatment. Advanced search techniques of web spiders, crawlers, and site scraping were applied. CulturIntel extracted topical data, tag data with the origin and user, and created a large, 'big' dataset.

Results: A total of 543,000 discussions about depression were captured, 43,000 in Hispanics with depression vs. 398,000 in non-Hispanics patients. The discussions are 1.7 times more negative among Hispanics with almost 7 out of 10 Hispanics discussions are negative versus 4 out of 10 for non-Hispanics. Hopelessness learned and cultural beliefs related to their "resignation," play a negative factor as a key barrier to care that is 1.5 times greater at the stage of pre-diagnosis/ suspect. Hispanics concern toward social appearances weighs heavily on the subject; "stigma" is discussed nearly twice as much, while the toll on others is higher than the non-Hispanic population.

Conclusion: Hopelessness Learned, can explain attitude prevents Hispanics from seeking help or inquiring about therapy as they rather "live and cope with it" than reach out for treatment. Our findings suggest a greater need to empower caregivers, professionals and families with information to contextualize the condition as treatable.

165) Abstract 1315

WHICH ASPECTS OF SOCIOECONOMIC STATUS MATTER FOR METABOLIC SYNDROME AMONG ELDERLY URBAN AFRICAN AMERICANS?

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Background: Distribution patterns of diseases are influenced by socioeconomic status (SES), and these patterns are more complicated when SES health disparities are confounded with racial health disparities. Studies suggest that the magnitude of the SES gradient in health is not always consistent across racial groups. This study focuses on older African Americans and aims to understand the link between multiple facets of SES and metabolic syndrome (MetS).

Method: Data were derived from an ongoing cross-sectional study on healthy aging among older African Americans in Detroit. Participants ($N = 95$, ages 50-89) reported their parents' education (childhood SES) and subjective social status (SSS, McArthur ladder scale) when they were teenagers (childhood SSS), their current income and education (current SES), and current SSS. Blood pressure and waist circumference were collected along with venous blood, from which we assessed triglycerides, HDL cholesterol, and glucose levels. These indicators were used to derive a dichotomous MetS score (National Cholesterol Education Program). BMI and covariates (age, gender, marital status, health conditions) were assessed.

Results: Of the sample, 53.7% met the criteria for MetS. Controlling for covariates, higher childhood SES was associated with a greater risk of MetS (OR = 1.98, 95% CI [1.02, 3.85]). This association persisted after controlling for current SES, which was not associated with MetS. Pathway analyses showed that the association between childhood SES and MetS was mediated by elevated BMI, which accounted for 49.1% of the total effect. Intergenerational upward mobility (i.e., achieving higher education than parents) was not associated with MetS. Childhood and current SSS were also not associated with MetS. However, participants reporting higher current SSS than their parents had a lower risk of MetS compared to those reporting equal or lower SSS than their parents (OR = 0.33, 95% CI [0.12, 0.91]). This association was not mediated by BMI but persisted after controlling for it and current SES.

Conclusion: Our findings suggest that neither childhood parental education nor attaining a better education than the previous generation is associated with a lower risk of MetS among older African Americans. In contrast, the perception of intergenerational mobility may be a key factor influencing physical health in this group.

166) Abstract 1294

OPIOID-RELATED RISK PERCEPTIONS IN CHRONIC PAIN: INFLUENCE OF PATIENT GENDER AND MISUSE BEHAVIORS

Alexis Grant, MA, Tracy Anastas, MS, Department of Psychology, School of Science at IUPUI, Indianapolis, IN, Megan Miller, PhD, Department of Psychology, IUPUI, Indianapolis, IN, Patrick Quinn, PhD, School of Public Health, Indiana University, Bloomington, IN, Kurt Kroenke, MD, MACP, School of Medicine, IU, Indianapolis, IN, Adam Hirsh, PhD, Department of Psychology, IUPUI, Indianapolis, IN. Although risk assessment has become increasingly important in the current opioid crisis, little is known about the factors that influence provider perceptions of patient risk for aberrant use behaviors or adverse opioid events. Prior work suggests that patient demographic factors such as gender may interact with previous opioid misuse behaviors to influence these risk perceptions. To examine these effects, we had 136 providers rate four domains of patient risk (prescription opioid misuse/abuse, prescription opioid diversion, opioid addiction, and opioid-related adverse events) for eight virtual patients with chronic pain. Patient gender (male/female) and previous misuse behaviors (present/absent) were varied across vignettes; the vignettes were otherwise balanced on demographic and clinical characteristics. Repeated measures ANOVA indicated a significant gender-by-misuse interaction for risk perceptions regarding *prescription misuse/abuse* ($F(1,135)=9.89$, $p<.01$). When previous misuse behaviors were absent, providers rated men at higher risk for prescription opioid misuse/abuse; there was no gender difference when previous misuse behaviors were present. A significant gender-by-misuse interaction was also found for risk perceptions regarding *opioid-related adverse events* ($F(1,135)=15.35$, $p<.001$). Providers perceived men to be at higher risk for adverse events when previous misuse behaviors were absent; there was no gender difference when previous misuse behaviors were present. A significant gender-by-misuse interaction was likewise found for risk perceptions of *addiction*. Providers rated women at higher risk for addiction when previous misuse behaviors were present, and men at higher risk when previous misuse behaviors were absent. There were significant main

effects of gender ($F(1,135)=18.85$, $p<.001$) and misuse ($F(1,135)=174.21$, $p<.001$) behaviors for risk perceptions regarding *opioid diversion*. Providers rated men and those with previous misuse behaviors at higher risk for opioid diversion. These results suggest that patient gender and previous misuse behaviors have unique and interactive effects on provider perceptions of prescription opioid-related risks. Future studies are needed to identify the mechanisms underlying these effects, such as gender-based stereotypes about risk-taking and drug abuse.

167) Abstract 1442

ASSOCIATION BETWEEN POLLUTION BURDEN USING THE CALENVIROSCREEN SCORES AND CORTISOL AWAKENING RESPONSE IN MINORITY ADOLESCENTS

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Background: Poor physical environments have been shown to be associated with a variety of health conditions, such as obesity and diabetes. However, the role of environmental stressors as they relate to biological stress responses has been understudied. The purpose of this study is to examine if greater pollution burden, as measured by the CalEnviroScreen (CES) tool, is associated with an altered biological stress response known as the cortisol awakening response.

Methods: By analyzing the Diabetes Risk due to Ectopic Adiposity in Minority Youth (DREAM) data, we collected data on Salivary Cortisol at 5:30 AM and 6:00 AM, which was used to calculate the cortisol awakening response (CAR). CalEnviroScreen Version 3.0 was used for overall environmental burden scores (includes: Ozone, Hazardous Waste, Toxic Release, Poverty, and overall Pollution Burden). The less environmentally burdened group had CalEnviroScreen scores less than 90th percentile based on a number of unique environmental burdens (CES percentile < 90th). The greater environmentally burdened group had CalEnviroScreen scores greater than or equal to the 90th percentile based on a number of unique environmental burdens (CES percentile > 90th).

Results: There were no differences in age, ethnicity, and gender by CES burden group (CES percentile < 90th group: age was 14.3 ± 0.39 years, ethnicity 50% African-American and 50% Latino, and gender 55% male vs. the CES percentile > 90th group the distribution of age was 14.6 ± 0.38 years, the distribution of ethnicity was 58% Latino, and the distribution of gender was 60% male). Adjusted for these variables, the CAR was shown to be lower in the CES percentile > 90th group, than in the CES percentile < 90th group (0.723 mg/dL vs. 0.982, $p<0.05$).

Conclusion: Those in the higher environmentally burden group had a more blunted CAR compared to the less environmentally burdened group. In future studies, these results may bring attention to the importance of stress related health issues and the impacts of environmental burdens on human health.

168) Abstract 1385

ASSOCIATION BETWEEN PERCEIVED STRESS AND DEPRESSIVE SYMPTOMATOLOGY IN AN ETHNICALLY-DIVERSE SAMPLE OF YOUNG ADULTS

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Background and Objective:

Depression affects more ethnic minorities in comparison to other ethnic groups, Latino/as, African-Americans, and American-Indians are amongst the highest ethnic groups at risk for depressive symptomatology. There is also a positive relationship between perceived stress and depression specifically amongst college students and working-class adults. This study seeks to investigate the

relationship between perceived stress and depression among college students. Based on the literature, we hypothesize that higher levels of perceived stress will be associated with higher depressive symptomatology.

Methods:

The Metabolism and Stress Assessment (MESA) lab seeks to understand various stressors among the young adult population of California State University, Northridge (CSUN). The study has a current sample of 24 participants with an N goal of 100, mean age 21.4 years old (SD=1.8). Of the 24 participants, 56.5% are Hispanic or Latino/a, 66.7% reported as female. The 10-item Perceived Stress Scale (PSS-10) and 20-item Center for Epidemiologic Studies-Depression (CES-D) scales were used to assess self-reported perceived stress and depression risk. A Pearson's correlation coefficient (r) value was computed to assess the relationship between perceived stress and depression.

Results:

There was a positive correlation between perceived stress and depression amongst CSUN colleges students ($r=0.664$, $n=24$, $p=0.001$).

Conclusion:

CSUN students who self-reported high levels of perceived stress also reported high levels of depressive-like symptoms. Further research with a larger sample size is needed to understand whether there is a differential effect of ethnicity/race or sex on the relationship between stress and depression.

169) Abstract 1694

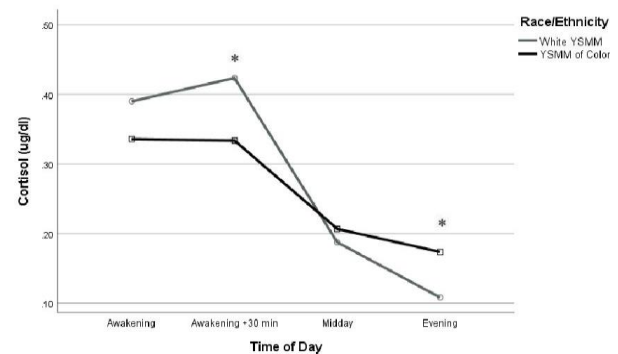
SEXUAL MINORITY MEN OF COLOR HAVE BLUNTED DIURNAL CORTISOL RHYTHMS COMPARED TO WHITE SEXUAL MINORITY MEN: A CASE FOR INTERSECTIONALITY

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Young sexual minority men (YSMM) may experience disrupted hypothalamic-pituitary-adrenal (HPA)-axis functioning as compared to their heterosexual counterparts due to sexual minority stress. However, young men who identify as both sexual and racial minorities may experience additional minority stress based on the intersection of sexual orientation and racial/ethnic identity. Nevertheless, there is a dearth of research examining HPA-axis functioning among White YSMM versus YSMM of color. The current study examined diurnal cortisol rhythms among $N=101$ White YSMM (44.5%) and YSMM of color (55.5%). Data came from a larger daily diary project examining sexual minority stress and HPA-axis functioning among YSMM recruited from a Midwest (59.4%) and a Northeast (40.6%) location ($M_{age}=22.7$, $SD=2.6$). Participants completed a baseline survey ascertaining demographic information and other psychosocial constructs. Starting the next day, participants provided four saliva samples a day (upon awakening, 30-minutes after awakening, midday, and evening) for five consecutive days to measure diurnal cortisol. After the first three samples, participants were provided with a link to a brief survey to gather information pertinent to cortisol (e.g., caffeine consumption). After the evening sample, participants were provided with a link to a longer nightly survey ascertaining experiences at the day-level. Racial/ethnic differences in diurnal cortisol measures were examined using repeated-measures analysis of covariance (ANCOVA) controlling for mean awakening time ($M=0930$, $SD=1.83$). A significant time by group interaction effect was observed ($F_{(2.5, 241.0)}=8.3$, $p<.0001$, $\eta^2=.08$). Post-hoc analyses found that YSMM of color had lower cortisol levels than White YSMM 30-minutes after awakening ($p=.03$) but higher cortisol levels than White YSMM in the evening ($p=.02$). Findings revealed a blunted diurnal cortisol curve among YSMM of color compared to White YSMM, with differences in cortisol 30-minutes after waking and in the evening (Fig. 1). Our

findings provide evidence that stress experienced at the intersection of sexual orientation and racial/ethnic identity may have a negative influence on HPA-axis functioning among YSMM of color. Researchers and clinicians should adopt an intersectional perspective when seeking to understand HPA-axis functioning differences among sexual minorities.

Figure 1.



170) Abstract 1674

SELF-EFFICACY PREDICTS TREATMENT BENEFIT IN PATIENTS UNDERGOING A FOUR-WEEK MULTIDISCIPLINARY PSYCHOSOMATIC INPATIENT THERAPY

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Background: Studies have shown the effectiveness of multidisciplinary psychosomatic inpatient treatment. In the present study we aimed to check the effectiveness of such treatment in a naturalistic setting with regard to different diagnostic groups including depression, somatoform disorders, anxiety and panic attacks. Our main hypothesis was that self-efficacy would predict benefit from the therapy. **Methods:** Patients were consecutively assessed by self-rated questionnaires at the beginning and end of psychosomatic inpatient treatment in a specialized hospital unit with regard to global quality of life (QOL; ACSA), disorder-specific somatoform and somatic symptoms (BBI), perceived stress (PSQ by Levenstein), anxiety (GAD-7), depression (PHQ-9), and self-efficacy (SWOP). Sociodemographic and clinical data were taken from the charts. The effectiveness of the treatment was evaluated by the change of the scores (pre post comparison) with regard to main diagnosis (depression, somatoform disorders, anxiety and other disorders) (mixed ANOVA). Self-efficacy, BMI, age, and length of inpatient stay were analyzed with regard to their impact on the therapeutic outcome (linear regression analysis). **Results:** Data sets from $N=110$ patients (75% female; 50.5 years, SD 15.5) could be analyzed. Across the whole sample, depression, anxiety, somatic complaints, and stress significantly decreased, while QOL increased (all $p<.001$). Reduction of depression was significant in the group of patients with depression disorders (59% depression as main diagnosis). In the group with somatoform disorders (21% of the patients), the decrease of somatic complaints did not reach significance. Self-efficacy was identified as a significant predictor for effectiveness of the treatment, with regard to reduction of depression, anxiety, somatoform symptoms, perceived stress, and improvement of QOL (all $p<.001$). **Discussion:** Our main hypothesis that self-efficacy would predict treatment benefit in

psychosomatic inpatients was confirmed. In sum, the data back the beneficial effects of inpatient psychosomatic therapy regarding reduction of depression, somatic complaints, perceived stress, and improved global QOL. However, the data also highlight the importance of diagnostic-specific efficacy studies and the need for treatment adaptation in patients with somatoform disorders.

171) Abstract 1318

IL-6 CYTOKINE LEVEL: RELEVANCE TO INFLAMMATION AND AUTONOMIC INDUCED PAIN AND FATIGUE IN FIBROMYALGIA AND ME/CFS

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INTRODUCTION: Fibromyalgia and ME/CFS are chronic, disabling, often poorly understood conditions, with overlapping systemic physical and psychological symptoms. Inflammatory abnormalities are reported. We seek to clarify how inflammation contributes to pain and fatigue in these conditions and relationship with dysautonomia.

METHODS: Fifty-seven participants (Clinical Diagnoses of Fibromyalgia or ME/CFS or both ($n=42$) and healthy controls ($n=15$)) were tested under two randomised conditions on separate visits: Inflammatory state (following typhoid vaccine) or placebo (following saline injection). IL-6, pain (VAS, Pressure Pain Thresholds (PPT)), reported fatigue (VAS) and autonomic function were measured pre and post (4 hours) injection. A subset of fifty participants underwent autonomic challenge (head up tilt 60°) with similar pre-post measurements of pain and fatigue. IL-6 levels were determined by High Sensitivity ELISA.

Associations were tested using regression, correcting for BMI as appropriate

RESULTS: Across all participants baseline IL-6 significantly correlated with baseline pain score ($r=0.274$, $n=2$, $p=0.05$) and reduction in PPT after vaccination ($r=0.331$, $n=52$, $p=0.016$).

Post-vaccination IL-6 significantly correlated with baseline pain across all participants (0-10) ($r=0.279$, $n=52$, $p=0.045$) and with change in heart rate on Active Stand ($r=0.286$, $n=50$, $p=0.044$).

IL6 concentration post-typhoid correlated with baseline pain ($r=0.358$, $df=45$, $p=0.014$, corrected)

Inflammation-induced change (placebo controlled) in IL6 correlated with both change in total reported fatigue ($r=0.477$, $df=18$, $p=0.033$, corrected) and reported physical fatigue ($r=0.454$, $df=18$, $p=0.045$, corrected) induced by tilt.

Inflammation-induced change (placebo controlled) in IL6 concentration correlated with change in mental fatigue induced by the study itself ($r=-0.470$, $df=18$, $p=0.03$, corrected)

DISCUSSION: These preliminary results demonstrate a relationship between inflammation, pain, fatigue and dysautonomia in Fibromyalgia and ME/CFS, previously poorly characterized.

CONCLUSION: Ongoing research is investigating these relationships in Fibromyalgia and ME/CFS including neuroimaging and transcriptomics. Understanding these biological mechanisms is crucial for targeting future therapeutic interventions and diagnostics in a patient group with significant morbidity.

172) Abstract 1639

THE ROLE OF HEART RATE VARIABILITY AND SEX IN DEPRESSION SEVERITY AND DEVELOPMENT A DECADE LATER: FINDINGS FROM MID-LIFE IN THE UNITED STATES (MIDUS)

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Background: Lower high-frequency heart rate variability (HF-HRV) is an index of dysregulated stress physiology associated with depression. Findings from a few longitudinal studies, conducted in mostly white samples, suggest lower HF-HRV predicts greater likelihood of developing depression in adult males. Using secondary data analysis, this study investigates whether sex moderates the relationship between HRV and depression severity and development in mid- and late-life.

Method: This study uses data from the MIDUS II biomarker project ($n=1255$, ages 35-86) conducted 2004-09, as well as data from MIDUS III collected 2013-14. To examine the concurrent association between HF-HRV and depression severity, linear hierarchical regression was conducted in a racially diverse subsample ($n=158$, 39% male, 40% African-American) with clinical depression ($CES-D \geq 16$). Logistic regression was used to explore the likelihood of developing future depression in participants who were not on antidepressants or diagnosed with depression at MIDUS II collection ($n=591$, 50% male, 3.5% African-American). Analyses controlled for breath rate, cardiometabolic conditions, antihypertensive and antidepressant use, and demographic and lifestyle factors (exercise, alcohol/tobacco use). Depressive symptoms at MIDUS II were included as a covariate in longitudinal analyses.

Results: In concurrent analyses, higher HF-HRV predicted lower depression severity ($\beta = -.23$, $p = .03$). Neither sex nor the interaction had a significant effect on depressive symptoms. Splitting the sample by sex, higher HF-HRV predicted lower depression severity in females ($\beta = -.33$, $p = .03$) but not males ($\beta = .01$, $p = .96$). HF-HRV, sex, and the interaction did not explain future depression development. However, for those endorsing depressive symptoms at MIDUS III, higher HF-HRV predicted a 45% decreased likelihood of meeting criterion for a major depressive episode ($OR = .55$, $p = .01$).

Conclusion: In clinically depressed middle-aged and older adults, higher HF-HRV is linked with less depression severity, appearing stronger in females compared to males in this diverse sample. Additionally, higher HF-HRV may distinguish between development of subthreshold depressive symptoms and major depression. Together, these findings suggest HF-HRV is a predictor of current and future depression severity among middle-aged and older adults.

173) Abstract 1312

PREDICTING ANTIDEPRESSANT RESPONSE THROUGH EARLY IMPROVEMENT OF INDIVIDUAL SYMPTOMS OF DEPRESSION INCORPORATING BASELINE CHARACTERISTICS OF PATIENTS: AN INDIVIDUAL PATIENT DATA META-ANALYSIS

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Aims: We aimed to investigate whether early improvement of individual depressive symptoms better predicts response or remission by taking account of important baseline characteristics of patients, by means of conducting an individual patient data meta-analysis of data from randomized controlled trials conducted in Japan.

Method: We requested pharmaceutical companies in Japan for individual patient data of placebo-controlled trials focusing on the efficacy of second-generation antidepressants. Primary and secondary outcomes were response and remission at week 6 assessed with the Hamilton Rating Scale for Depression, respectively. We compared models that only included improvement in overall depression severity at week 2 with models that also included improvement in individual symptoms.

Results: We obtained individual patient data of three trials comprising 997 participants, investigating the efficacy of duloxetine, escitalopram, mirtazapine, or paroxetine. For the response outcome, the area under the receiver operating characteristic curve, and positive and negative predictive values were 0.57, 0.66, and 0.54 in the model including early improvement in overall depression only, respectively, which meant the performance was very poor. After incorporating individual symptoms and their interactions, the values were 0.65, 0.70, and 0.64, respectively, which suggested that only limited improvement was achieved, and that 30% and 36% of the participants had still false-negative and false-positive predictions, respectively. For the remission outcome, these values in the latter model were 0.72, 0.62, and 0.68, respectively.

Conclusions: Incorporating individual symptom improvements into overall improvement in depression does not lead to marked additive values in predicting subsequent response, even adjusting important baseline characteristics of patients. We suggest that clinical judgement on early discontinuation of antidepressant from non-early improvement at week 2 would be carefully made, until a more powerful prediction model is established.

174) Abstract 1831

THE CONSEQUENCES OF AFRICAN AMERICAN AND LATINX IMMIGRANT MOTHERS' TRAJECTORIES OF PSYCHOLOGICAL DISTRESS ON CHILDREN'S PHYSICAL HEALTH

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Maternal psychopathology is a crucial, yet overlooked, determinant of children's health. For instance, mothers with psychological distress exhibit lower levels of supportiveness, sensitivity, and responsiveness toward their children's needs (Dinz et al., 2014; Foster et al., 2008), and experience diminished abilities to engage in preventative health measures (e.g., providing healthy foods, making doctor appointments). This in turn purportedly creates child stress and further exacerbates children's health concerns. While previous literature has linked maternal psychological distress to child development across multiple domains (cognitive, social, emotional, and psychological), seldom has research expanded upon the influence of psychological distress on child health outcomes, especially among disadvantaged populations where the risk of psychopathology is most acute. Thus, this study aimed to elucidate the relationship between maternal psychological distress patterns and children's overall health over six years among ethnic minority families from low income backgrounds. A longitudinal study on culture and school readiness in children followed African American and Latina immigrant mothers ($N = 272$) over a six-year period. Mothers were annually interviewed and assessed for symptoms of psychological distress from six-months postpartum to when their child was 76 months of age (about 6.5 years). Additionally, mothers were asked to report their child's overall health (e.g., 1 = *Poor*, 5 = *Excellent*; McGee et al., 1999) from 14 to 76 months of age. A crossed-lagged structural equation model revealed that both maternal distress ($\beta = .54$ to $.74$) and child's overall health ($\beta = .40$ to $.51$) were stable across consecutive years. Furthermore, maternal distress at 24 and 52 months predicted poor child's overall health one year later [36 ($\beta = -.18$, $p < .01$), and 64 months, ($\beta = -.16$, $p < .05$, respectively)]. Finally, our results revealed concurrent correlations at 36 months ($\beta = -.34$, $p < .001$) and 64 months ($\beta = -.12$, $p < .05$), which suggests that higher maternal distress predicted poorer child's overall health for these two time periods. Further investigation is imperative to explain why significant correlations were evident between ages 2-5 in particular. Nonetheless, our results reinforce the implications of maternal psychological well-being on child health.

175) Abstract 1909

PROJECT UPLIFT: EFFECTS OF A TELEPHONE-BASED MINDFULNESS PROGRAM ON DEPRESSIVE SYMPTOMS IN HISPANIC ADULTS WITH EPILEPSY

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Introduction: Depression is a common comorbidity in epilepsy that is associated with mortality, poor seizure control and impaired quality of life. Project UPLIFT is a group-based program developed to reduce depressive symptoms in people with epilepsy (PWE). Informed by principles of mindfulness-based cognitive therapy, UPLIFT incorporates features to address the needs and barriers of PWE (e.g., disease-specific content, telephone delivery). Positive effects have been demonstrated in English-speaking PWE. The NYU Center in the CDC's Managing Epilepsy Well Network translated and culturally adapted UPLIFT for Hispanic PWE and pilot tested the program. **Methods:** Hispanic PWE with elevated depressive symptoms ($n=72$) were enrolled from epilepsy clinics at NYU Langone and Bellevue Hospital Center (2016-2018). Participants were randomized to UPLIFT or usual care (UC) and followed for 12 months. UPLIFT was delivered in English or Spanish to groups of 6 participants in 8 weekly 1-hour telephone sessions. The proportion of participants reporting elevated depressive symptoms (mild or greater; PHQ-9 ≥ 5) at 8 weeks, 6 months and 12 months was compared between arms. **Results:** The mean age was 43.3 ± 11.3 years, 70.8% of participants were female, 66.7% were Spanish-speaking and 45.8% had less than a high school education. Mean baseline PHQ-9 scores were similar in the UPLIFT and UC arms (8.1 ± 4.8 vs. 8.7 ± 4.7). Retention rates were 93% at 8 weeks, 90% at 6 months and 86% at 12 months. UPLIFT participants completed a median of 6 out of 8 sessions. Rates of elevated depressive symptoms were lower in the UPLIFT vs. UC arm throughout follow-up (63% vs. 72% at 8 weeks; 40% vs. 70% at 6 months; 47% vs. 70% at 12 months). Generalized estimating equations adjusted for cohort, antidepressant medication use, age and education suggest clinically meaningful differences at 6 months (OR=0.24, 95% CI, 0.06-0.93), which were somewhat reduced at 12 months (OR=0.30, 95% CI, 0.08-1.16). **Conclusions:** Results suggest that the adapted UPLIFT program is a promising approach for reducing depressive symptoms in Hispanic PWE. Further research is needed to replicate findings in a larger sample and to examine generalizability of the program for Hispanic PWE outside the NYC area. If effective, this scalable intervention has the potential to reach and improve health outcomes in a large, underserved population.

176) Abstract 1263

PERSONALITY PREDICTORS OF READMISSION AMONG ADULT PSYCHIATRIC INPATIENTS

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Readmission of psychiatric inpatients is highly disruptive to patients and their families and also places a significant burden on the healthcare system. Rehospitalization is often used as a metric of quality of care in psychiatric settings, but little is known about how specific personality characteristics impact rehospitalization. The goal of this study was to examine the relationship between personality characteristics and subsequent readmission in adult psychiatric inpatients. A convenience sample of 94 adults (mean age=36.8, SD=14.1; female=54.3%; European American=76.6%) residing at an inpatient psychiatric hospital completed the Personality Inventory for DSM-5-Brief Form (PID-5-BF; American Psychiatric Association, 2013), and other psychosocial measures as part of a larger study. Demographic and

medical information and readmission data were extracted via chart review one year after admission. Poisson regression was used to predict number of readmissions at both 6- and 12-months from PID-5-BF domain scores of Negative Affectivity, Detachment, Antagonism, Disinhibition and Psychoticism and total PID-5 scores, while controlling for age and gender. Of 94 discharged inpatients, 23 (24.5%) were readmitted at 6-month and 30 (31.9%) at 12-month follow-up. There were 38 total readmissions at 6-months and 54 at 12-months in the sample. Higher scores on Negative Affectivity predicted greater number of readmissions at both 6 months (Incidence Rate Ratio (IRR)=1.14, robust standard error (RSE)=0.05, $p<0.01$, 95% CI [1.04, 1.25]) and 12 months (IRR=1.07, RSE=0.035, $p=0.047$, 95% CI [1.00, 1.16]). Higher Detachment scores also predicted greater number of readmissions, but only at 6-months (IRR=1.13, RSE=0.053, $p=0.024$, 95% CI [1.00, 1.27]). The other domain scores and PID-5 total scores were not significantly related to number of readmissions at either follow-up. Thus, greater Negative Affectivity scores on the PID-5-BF, indicative of higher trait neuroticism, heightened experience of negative emotions and poor self-concept, were the most significant personality predictor of readmission in the study. These results suggest that the PID-5-BF might be a useful tool to help identify psychiatric inpatients at greater risk for readmission and also determine those most in need of interventions that may help reduce or delay rehospitalization.

177) Abstract 1166

THE ASSOCIATION BETWEEN BODY ADIPOSITY AND DEPRESSIVE SYMPTOMS AMONGST YOUNG ADULTS WITH HIGH RISK FOR TYPE 2 DIABETES

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Background: Depression is one of the most common mental health conditions in the United States and major depressive episodes are highest among young adults aged 18-25 years. Depression also co-occurs with other physical health conditions, such as obesity which has been on a steady rise. Few studies investigate the association between percent body fat (PBF) and depression and even fewer target populations with high comorbidity risk. The study objective is to compare the relationships between body adiposity measurements and depressive symptoms among young adults at risk of developing type 2 diabetes and depression.

Methods: The Metabolism and Stress Assessment (MeSA) lab is currently recruiting California State University, Northridge students ages 18-25 years old with a family history of type 2 diabetes. Obesity is being evaluated using body mass index (BMI) and PBF measured by bioelectrical impedance analysis. Depressive symptoms are being evaluated using the 20-item Center for Epidemiologic Studies Depression (CES-D) Scale with a score of 16 or greater indicating depression risk. Point-Biserial correlation assessed the relationship between BMI (kg/m^2), PBF, and CES-D scores.

Results: The preliminary sample ($n=24$) was comprised of 66.7% female, 56.5% Hispanic or Latino/a, 21.7% Asian, 13.0% Caucasian, and 8.7% Black. 45.8% of the sample were at risk for depression and 62.5% were overweight/obese. The sample had a mean of 21.33 years ($SD=1.83$), 26.56 kg/m^2 ($SD=5.86$), 26.79 PBF ($SD=9.28$), and 16.29 CES-D score ($SD=8.90$). Preliminary results found that BMI was marginally associated with depression risk ($r=0.40, p=0.05$), while PBF was not ($r=0.01, p=0.96$).

Conclusion: The results of this ongoing study showed that BMI may be associated with depressive symptoms. Data analysis for the final sample ($n=100$) will increase statistical power and decrease possibility of type II errors. This will allow us to further investigate whether body adiposity is a predictor of depression and provide promising implications for prevention strategies among this at-risk population.

178) Abstract 1286

THE ROLE OF PERCEIVED SOCIAL SUPPORT IN MODULATING CHILDREN'S PHYSIOLOGICAL RESPONSES TO STRESS: EVIDENCE FOR STRESS-BUFFERING HYPOTHESIS

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Objectives: It has been hypothesized that social support is protective for health because of its buffering effects on neuroendocrine axes implicated in the stress response system. Cumulative life stress contributes to individual differences in the sensitivity of the stress response system. Previous studies have investigated the role of social support in modulating cortisol responses to transient laboratory stressors. However, we know little about how social support modulates physiological reactivity to transient stressors in people that have been exposed to a high (low) number of life stressors. This study examined whether perceived social support would buffer the effect of cumulative life stressors on HPA axis (cortisol) and autonomic nervous system (salivary alpha-amylase) responsivity to an acute laboratory stressor.

Methods: A sample of 150 children (aged 9-13) reported perceived social support, stressful life events, and underwent the Modified Trier Social Stress Test, during which six saliva samples were collected. A two-piece multilevel growth curve model with landmark registration (GCM-LR) was used to detect trajectory differences in the reactivity and recovery phases of the stress response and account for individual variation in the timing of post-stress peak hormone concentrations.

Results: Analyses revealed that the interaction between life events and social support significantly predicted post-stress peak cortisol levels and the cortisol recovery slope. Children reporting high life events and low social support exhibited the lowest post-stress peak cortisol levels and the flattest cortisol recovery slope, whereas children high in life events and high in social support displayed cortisol response profiles more similar to those of children with low life events. No statistically significant two-way interactions between life events and social support for salivary alpha-amylase parameters were observed.

Conclusions: These results provide preliminary evidence suggesting that high life events and low social support jointly predict the lowest post-stress cortisol peak and the flattest recovery cortisol slope. Understanding the biological mechanisms by which social support influence health paves the way for making efforts to prevent allostatic load, and ultimately, reduce risk of health problems in children facing high levels of cumulative stress.

179) Abstract 1085

CHILDHOOD ADVERSITY AND CORTISOL HABITUATION TO REPEATED STRESS IN ADULTHOOD

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Childhood adversity is a robust predictor of poor health outcomes in adulthood and hypothalamic-pituitary-adrenocortical (HPA) axis dysfunction of the stress response may be a key mechanism explaining this association. For example, childhood adversity has been linked to both inadequate (blunted) cortisol responses to acute stress and psychiatric conditions (e.g., major depression) in adulthood. However, little is known about the influence childhood adversity may exhibit on adult HPA axis habituation (i.e., decreased cortisol output in response to a repeated stressor), another marker of HPA axis dysregulation. A lack of HPA axis habituation to repeated stressors has been shown in

animals with high early life adversity, with sex-dependent effects. To address this knowledge gap, the current study draws from a larger study examining the effects of stress management interventions on cortisol habituation to repeated stress. Eighty-three adults (reporting moderate to high stress, aged 18-50, 72.1% female) reported childhood adversity with the Adverse Childhood Experience scale and completed the Trier Social Stress Test (TSST) on two separate laboratory visits (48 hrs apart) after the 6-wk intervention period. Salivary cortisol was assessed pre-stressor and +25, +35, and +60 mins post-stressor at both visits. Habituation was defined as the difference between cortisol output at visit 1 and visit 2. Mixed linear models revealed a significant interaction (Sex x Childhood Adversity x Visit) predicting mean natural log transformed cortisol across visit ($F(1,560) = 4.54, p = .034$). Follow up contrasts (Figure 1) revealed that greater childhood adversity was associated with a larger decrease in total cortisol from visit 1 to visit 2 among males ($t(560) = 2.12, p = .034$) but not females ($t(560) = 0.60, p = .54$). However, this interaction was rendered marginally significant when controlling for study condition ($F(1,558) = 2.72, p = .099$). There was no effect of childhood adversity on initial cortisol responses. Results indicate that childhood adversity is associated with diminished HPA axis habituation in females but greater HPA axis habituation in males. These findings suggest that HPA axis habituation to repeated stress may be a pathway through which childhood adversity may affect adult health, though these effects may be different for men and women.

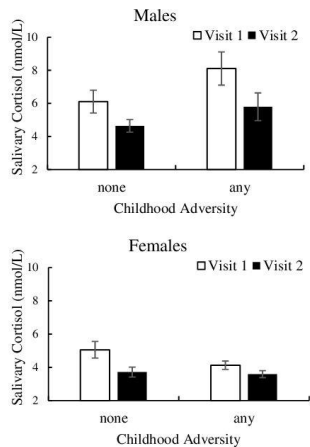


Figure 1. Salivary cortisol as a function of sex, childhood adversity, and study visit. Individuals who scored 0 on the ACE were considered to show no childhood adversity (i.e., “none” category) whereas individuals with scores above 0 on the ACE were considered to show at least some childhood adversity (i.e., “any” category). Means shown correspond to average salivary cortisol across all samples obtained during a given visit. Error bars shown correspond to standard error of mean estimates.

180) Abstract 1397

THE HERITABILITY OF TYPE D PERSONALITY BY AN EXTENDED TWIN-PEDIGREE ANALYSIS IN THE NETHERLANDS TWIN REGISTER

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Background: Type D (*Distressed*) personality combines negative affectivity (NA) and social inhibition (SI), and is associated with an increased risk of cardiovascular disease and mood disorders. Social inhibition also is a key feature of avoidant personality disorder.

Objective: To estimate the heritability of the Type D personality traits in an extended twin-pedigree study in the Netherlands Twin Register (NTR), using a new Type D proxy based on the Achenbach System of Empirically Based Assessment (ASEBA).

Methods: The Type D personality proxy, including NA and SI subscales, was created (12 ASEBA items) in 30,433 NTR participants (16,449 twin individuals and 13,984 relatives from 11,106 pedigrees).

‘Mendel’ software estimated additive/non-additive genetic components and shared/unique environmental components for Type D, NA, and SI. Bivariate models estimated the genetic and environmental covariance between NA and SI.

Results: The Type D proxy showed good reliability and construct validity. The best-fitting model included both additive and dominance genes, and broad-sense heritability for Type D (dichotomous), NA, and SI were estimated at 32%, 49%, and 50%. Household effects showed marginal contributions (4-9%) to the total phenotypic variation. Genetic correlations between NA and SI were .56 for additive and .69 for non-additive factors, indicating a shared geneset influencing both Type D subcomponents.

Conclusions: Extended pedigree analysis confirmed that Type D personality and its NA and SI subcomponents are substantially heritable, with a shared genetic basis for both Type D personality pillars. These results warrant further exploration of the genetic variants underlying this heritability.

181) Abstract 1779

SCHOOL RISK AND ANTIBODY RESPONSE TO INFLUENZA VACCINATION IN ADOLESCENCE

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Adolescents spend about eight hours a day in educational settings (U.S. DHHS, 2018). School-related stress is associated with emotional health and academic performance (e.g., Essex et al., 2011), which is not surprising given the substantial portion of waking hours spent in school. Less is known, however, about how stress and support at school are related to clinically relevant measures of adolescent physical health. The present study examined the relation between adolescents’ problems at school and antibody response to influenza vaccination in a sample of healthy adolescents. Given previous findings that link psychosocial stress with dampened antibody response to vaccination in adults (e.g., Burns & Gallagher, 2010), we hypothesized that problems at school would be negatively associated with antibody production following vaccination.

Participants were 143 adolescents ages 12-17 ($Age = 14.6, SD = 1.6$) who completed two study visits. At the first visit, adolescents received the influenza vaccine, provided a blood sample, and participated in the Life Stress Interview (LSI – a semi-structured interview that assesses stress across psychosocial domains; Adrian & Hammen, 1993). Four weeks later, adolescents provided another blood sample. Hemagglutination inhibition (HAI) antibody titers were examined pre- and post-vaccination. We used standard correction methods (Beyer et al., 2004) to control for differences in baseline antibodies. A School Risk Index was created by summing standardized measures of school distress, teacher conflict, behavioral problems, and chronic school stress (all of which were coded from adolescents’ LSIs).

Regression analyses tested whether school risk was associated with antibody response to individual influenza strains and the standardized mean composite of all four strains (Table 1). Unexpectedly, school risk was positively associated with antibody production for the H1N1 and B/Colorado strains, as well as the mean composite of all strains. School risk was not associated with antibody production for the H3N2 or B/Phuket strains.

These findings suggest that school risk is associated with greater antibody production following influenza vaccination and challenge the notion that stress uniformly dampens vaccine responses. Our study suggests a need to consider contexts in which stress is immunosuppressive versus immunoenhancing for adolescents.

Table 1**Regression Analysis Summary of School Risk on Ab Production**

Variable	β	SE	p
A/H1N1 ($n = 135$)	0.221	0.143	0.010
A/H3N2 ($n = 140$)	0.093	0.034	0.274
B/Phuket ($n = 142$)	0.086	0.036	0.311
B/Colorado ($n = 143$)	0.183	0.036	0.029
All strains composite ($n = 143$)	0.190	0.022	0.023

182) Abstract 1615**THE CULTURE OF CUDDLING: ARE GUT MICROBES LINKED TO SOCIAL BEHAVIOR?**

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Introduction: Emerging research has revealed linkages between autism and lower relative abundances of commensal bacteria in the gut including *Akkermansia*. The current study explores whether there is a prosocial flip-side to the gut-brain-microbiome associations observed in autism, and specifically explores the potential relation between prosociality and microbial composition. This connection is especially plausible given decades of research connecting prosocial temperamental features such as lower levels of Cuddliness (one sub-category of Effortful Control/ self-regulation) in children later diagnosed with autism.

Methods: Next generation pyrosequencing was used to examine the links between children's gut microbial profiles and maternal ratings of prosocial temperament in 77 toddlers, ages 18-27 months of age (46.7% female, Mage= 23.14 months). As an overarching temperament category, Effortful Control, measures children's self-regulating capabilities with Cuddliness as a prosocial behavior used to regulate emotion. Thus, we hypothesized that children with higher levels of Effortful Control, specifically tied to Cuddliness (parent directed affection), and Sociability (peer directed friendliness) would have higher relative abundances of commensal bacterium.

Results: After adjusting for meat and vegetable consumption, body composition and breastfeeding duration in this and all subsequent analyses (adjusted $R^2 = 0.05$, $p = 0.12$), results revealed a positive association between Cuddliness and *Akkermansia*, $\Delta R^2 = 0.124$, $b = 0.35$, $SE = .01$, $p = 0.001$ but Sociability was not associated with *Akkermansia* ($b = 0.13$, $p = .26$).

Discussion: These findings complement prior research linking a low relative abundance of *Akkermansia* to neurological conditions featuring social deficits such as autism and suggests that commensal bacteria may be linked to prosocial behaviors used to regulate emotion. These results hint at a prosocial flip-side to existing research linking autism to microbial profiles in the gut.

183) Abstract 1335**SYMPTOMATIC JOINT HYPERMOBILITY: RELEVANCE TO INFLAMMATION AND AUTONOMIC-INDUCED PAIN AND FATIGUE IN FIBROMYALGIA AND ME/CFS**

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INTRODUCTION

Fibromyalgia(FM) and ME/CFS are chronic, disabling conditions that share physical and cognitive symptoms. Both are poorly understood and associated with inflammatory abnormalities, autonomic problems, and joint hypermobility-an indicator of variant connective tissue, classified as hypermobile Ehlers Danlos Syndrome(hEDS) and Hypermobility Spectrum Disorder.

METHODS

Forty-eight patients with FM or ME/CFS were assessed for symptomatic hypermobility (hEDS) using 2017 Diagnostic Criteria and Revised Brighton Criteria for Joint Hypermobility Syndrome(JHS). All underwent autonomic evaluation (including 60o head up tilt) and Pressure Pain Thresholds(PPT) measurements. A subset($N=35$) underwent an experimental inflammatory challenge (typhoid vaccination) versus placebo (saline injection) on separate randomized counterbalanced visits, recording self-rated mental and physical fatigue (visual analogue scales), objective changes in autonomic function (heart rate(HR) change following Active Stand) and PPT measurements. Independent t-tests were used to compare group differences and regression analyses to determine symptom associations.

RESULTS

Eight patients (all female) met hEDS criteria, 40 met JHS criteria (35 female).Patients meeting hEDS criteria, compared to those not, showed greater HR change on standing (respectively, mean(bpm) \pm SE; 24.2 ± 4.8 vs 13.3 ± 1.43 , $t(33)=2.7$, $p=0.01$)(1A), and greater increases in mental fatigue during inflammation (respectively; 15.0 ± 5.84 vs -6.0 ± 3.93 , $t(33)=2.1$, $p<0.05$)(1B). Patients meeting hEDS Criterion 2 showed reduction in PPT during head up tilt (hEDS 2+ve vs hEDS2-ve; mean change \pm SE, respectively; -0.30 ± 0.14 vs 0.04 ± 0.08 , $t(40)=2.1$, $p<0.05$)(1C).

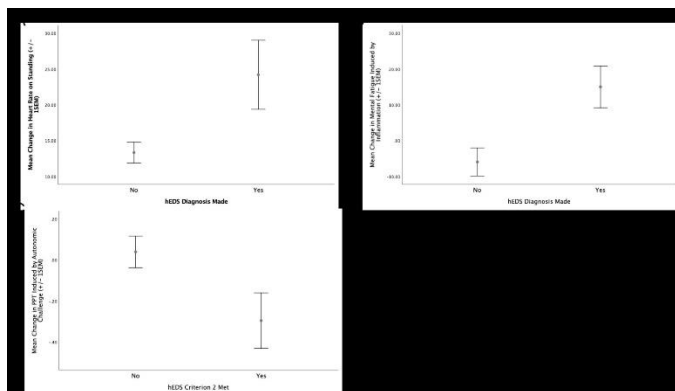
Connective tissue signs predicted HR increase on standing: (# signs meeting hEDS criterion 2A, correlated with HR change; $R=0.36$, $p<0.05$) and inflammation-induced changes in PPT (# signs meeting 'minor' Brighton JHS criteria correlated with PPT change; $R=0.328$, $p<0.05$).

DISCUSSION

These preliminary results highlight relationships between symptomatic connective tissue variants, inflammation and autonomically-mediated pain and fatigue.

CONCLUSION

This study is part of a research program on brain-body mechanisms underlying symptoms associated with hypermobility, FM and ME/CFS. Understanding these relationships is crucial for targeting future interventions for a population that experience considerable morbidity.



184) Abstract 1868

META-ANALYTIC EVIDENCE FOR SHARED AND SPECIFIC HUMAN NEURAL CORRELATES OF STRESSOR-EVOKED CARDIOVASCULAR REACTIVITY AND CARDIAC INTEROCEPTIVE PROCESSING

Thomas E. Kraynak, MS, Anna L. Marsland, PhD, Psychology, J. Richard Jennings, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Hugo D. Critchley, DPhil, Psychiatry, Brighton and Sussex Medical School, Brighton, NA, United Kingdom, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA. Stressor-evoked cardiovascular reactivity (CVR) is implicated in cardiovascular disease (CVD) risk. Although several human neuroimaging studies have begun to identify the functional neural correlates of CVR, it is unclear whether these neural correlates reflect efferent (brain-to-body) commands or afferent (body-to-brain) representation of cardiac interoceptive information. To address this knowledge gap, the present systematic review and meta-analysis synthesized and summarized published functional neuroimaging studies of CVR and cardiac interoceptive processing (CIP). First, we tested for consistently reported effects within each study domain. Next, we tested whether these two study domains reported spatially overlapping (shared) or spatially separable (specific) neural correlates of CVR and CIP.

Results from multilevel kernel density analysis (MKDA) of 11 CVR studies (15 analytic maps, 212 coordinates, 301 participants) revealed consistent effects in the ventromedial prefrontal cortex, ventral and dorsal anterior cingulate cortex, right anterior insula, amygdala, caudate, putamen, thalamus, and hypothalamus (cluster-level family-wise error rate (FWER) corrected $p < .05$, mean proportion activated 0.52). Separately, MKDA of 20 CIP studies (23 analytic maps, 203 coordinates, 509 participants) revealed consistent effects in the bilateral anterior and posterior insula, inferior frontal gyrus, and inferior parietal lobule ($p_{FWER} < .05$, mean proportion activated = 0.41). Meta-analytic conjunction analyses revealed spatially overlapping neural correlates for CVR and CIP in the right ventral anterior insula, dorsal anterior cingulate, and thalamus. Density contrast analyses revealed relatively specific neural correlates for CVR and CIP in the ventromedial prefrontal cortex and anterior insula, respectively.

Collectively, these meta-analytic findings suggest that efferent and afferent cardiovascular control processes may converge within a cingulate-insular-thalamic circuitry, corresponding to a putative brain-body pathway linking psychological stress to the generation and representation of stress-related cardiovascular physiology.

185) Abstract 1403

THE PAIN SEVERITY BECOMES CODABLE IN ICD-11: VALIDATION OF THE NEW EXTENSION CODE

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Background and aims: Approximately 20% of the global population suffer from chronic pain. However, chronic pain conditions are not represented adequately in the 10th edition of the International Classification of Diseases (ICD-10). To improve this, an IASP Working Group has developed a new classification consisting of seven categories of chronic pain for the upcoming ICD-11. For all chronic pain diagnoses, optional extension codes are available. One of them is the severity of chronic pain code, which will supplement the categorical diagnosis with a dimensional measure of pain severity. Pain severity is a compound measure of pain intensity, pain-related interference and pain-related distress. Each component is rated on numerical rating scales (NRS) by the patient ranging from 0 to 10. The aim of the present study was to evaluate the new severity extension code.

Methods: An online survey was posted to support groups for chronic pain. The participants provided informed consent and rated each of the severity determinants (intensity, pain-related interference and pain-related distress) on an NRS from 0-10. They also completed the Pain Disability Index (PDI), the Brief Symptom Inventory (BSI) and the German Pain Coping Questionnaire (FESV).

Results: 595 participants completed the online survey. 88.7% (N=528) were female and the mean age was $M=59.5 \text{ years} \pm 135.0$ years. The participants mean pain intensity was 6.43 ± 1.85 . Pain-related interference was in average 6.65 ± 2.12 and the perceived mean pain-related distress was 5.69 ± 2.53 . To obtain an indication of convergent validity, Pearson correlations were computed to determine the relation between the specifier components and the collected questionnaires. The rating of the pain-related interference correlated positively with the total score of the PDI ($r=.652$, $p<.001$). The experienced pain-related distress was strongly correlated with the BSI score ($r=.556$, $p<.001$) and the subscales from the FESV with the strongest association to hopelessness ($r=.645$, $p<.001$).

Conclusions: The extension code for pain severity is valid and allows recording additional parameters, which can be used to monitor the course of the pain and its treatment. Being only a brief rating, the code is more efficient than questionnaires. Its efficiency makes it possible to use it when a questionnaire would not be feasible, e.g. in primary care.

186) Abstract 1914

THE IMPORTANCE OF POSITIVE EVENTS WHEN LIVING WITH CHRONIC PAIN

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An estimated 20% of adults in the United States suffer from chronic pain, a condition related to high levels of anxiety and depression. Researchers have posited that living with chronic pain may prevent people from engaging in as many enjoyable activities as they would otherwise, which may contribute to feelings of distress. In addition, pain may prevent people from deriving the same positive emotions from these events. Few studies, however, have examined how exposure and reactivity to daily events differ between those with and without chronic pain. We hypothesized that those with chronic pain will have less exposure and less positive affect reactivity to positive daily events compared to those without chronic pain. We further

predicted that negative affect would be lower on days when a positive event occurs, but this decrease would be smaller for people who experience chronic pain compared to those who do not.

Data from a national longitudinal study of health and wellbeing included eight days of daily report. Participants ($N = 1,733$; $n_{\text{ChronicPain}} = 658$, $n_{\text{NoPain}} = 1,075$) were predominately Caucasian (91%), 56% female and had an average age of 56.24 years ($SD = 12.20$). Contrary to predictions, chronic pain status was unrelated to the frequency of positive events ($M_{\text{ChronicPain}} = 1.13$, $M_{\text{NoPain}} = 1.12$). In addition, multi-level models revealed that although people with chronic pain had lower levels of daily positive affect, they reacted more positively to daily events ($\gamma = -.033$, $SE = .010$, $p < .0001$). As a result, levels of daily positive affect were similar on days when people experienced a positive event ($M_{\text{ChronicPain}} = 2.73$, $M_{\text{NoPain}} = 2.75$). In general, people with chronic pain had higher levels of daily negative affect compared to people without chronic pain. Yet, on days they experienced a positive event, those with chronic pain had a greater decrease in their negative affect, such that their level of reported negative affect was similar to people without chronic pain ($M_{\text{ChronicPain}} = .21$, $M_{\text{NoPain}} = .20$). Findings suggest that positive events impact those with chronic pain more than they do individuals without chronic pain. Results underscore the need to focus on increasing the frequency of positive events in the lives of those suffering from chronic pain.

187) Abstract 1151

PAIN AND WORKING MEMORY DEFICITS: THE MEDIATING AND MODERATING ROLE OF PAIN CATASTROPHIZING

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A bidirectional relationship between pain and cognitive dysfunction has been observed in clinical and experimental contexts. This relationship holds across myriad cognitive domains, particularly working memory (WM), but its mechanisms are poorly understood. Pain catastrophizing – an exaggerated negative orientation toward actual or anticipated pain – may play an important role in the pain-cognition nexus by consuming cognitive resources normally utilized by WM. To better understand these relationships, we randomized healthy participants to an ischemic pain ($n=51$) or control ($n=51$) condition, during which they completed verbal and non-verbal WM tasks. Participants also completed measures of state- and trait-level pain catastrophizing.

Mediation analyses indicated that state-level pain catastrophizing mediated the relationship of pain group with verbal ($b = -9.15$, 95% CI: $[-17.37, -2.96]$) and non-verbal ($b = -12.19$, 95% CI: $[-22.19, -2.93]$) WM. Specifically, participants in the pain group (vs. control group) engaged in more state-level catastrophizing, resulting in worse verbal and non-verbal WM performance. Moderated mediation analyses indicated that trait-level pain catastrophizing moderated the mediation effect (pain group \rightarrow state-level catastrophizing \rightarrow WM) for both verbal (index of moderated mediation = $-.21$, 95% CI: $[-.51, -.03]$) and non-verbal (index of moderated mediation = $-.30$, 95% CI: $[-.66, -.05]$) WM. Participants in the pain group reporting higher (vs. lower) trait-level catastrophizing engaged in more state-level catastrophizing during the pain task, resulting in worse verbal and non-verbal WM.

This study provides important new information about the role of pain catastrophizing in the pain-cognition nexus. The results suggest that WM deficits in people with pain are due, in part, to the interaction of dispositional and in-the-moment catastrophizing about pain. Should these findings be replicated in clinical samples, the next step would be to develop and test interventions aimed at mitigating these and other cognitive consequences of pain. Cognitive-behavioral and acceptance-based approaches offer particular promise in this respect.

188) Abstract 1296

REM STRATEGIES FOR PEDIATRIC OPIOID USE: PROVIDERS ARE MORE LIKELY TO REQUIRE URINE DRUG SCREENING FOR BOYS THAN GIRLS WITH CHRONIC PAIN

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Previous studies in adults have found that racial minorities and women receive poorer pain care. Although less well-established, similar findings have been reported in the pediatric pain literature. Owing to the recent increased concern about misuse of prescription and non-prescription analgesics, pain care for adults and children has placed a greater emphasis on risk evaluation and mitigation (REM), particularly surrounding opioid therapy. Two common REM strategies are the use of opioid contracts (i.e., agreement plans) and urine drug screening. Little is known about how these strategies are used, particularly in pediatric pain, or about possible race and gender differences in their use. In this study, we examined providers' concern about opioid diversion and decisions to require opioid contracts and urine drug screens across patient gender and race groups. Medical students (aka "providers," $N=129$, 56% male, 64% White) viewed videos of four virtual 12-year old pediatric abdominal pain patients (Black/White x Female/Male) and their race-matched maternal caregivers, and read text vignettes describing relevant medical and psychosocial factors. Providers were asked to assume they had prescribed opioids to each patient. They were then asked to rate the: 1) degree to which they were concerned about diversion of opioid medication, 2) likelihood they would require an opioid contract, and 3) likelihood they would require a urine drug screen. A repeated measures ANOVA indicated a significant main effect of patient gender on urine drug screening, with providers more likely to require screening for male than female patients (mean difference [MD] = 2.31 , $p < .01$, $SE = .81$, 95% CI = $70, 3.91$, $\eta_p^2 = .06$). There were no significant race or gender differences for concerns about medication diversion or use of opioid contracts. These findings suggest that providers may be more likely to monitor male pediatric patients when prescribing opioids. Although providers did not explicitly endorse greater concern about opioid diversion for boys, the significant gender difference in urine drug screening may be a behavioral indicator of more concern regarding opioid misuse among boys. Research is needed to replicate these findings and examine whether gender differences extend to other REM strategies (e.g., using prescription drug monitoring programs) or vary with other demographic factors (e.g., age).

189) Abstract 1267

INFLUENCES OF LINGUISTIC CONTEXT AND CULTURAL MINDSET ON PAIN RESPONSES IN SPANISH-ENGLISH BILINGUALS

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Pain is a universal experience which is known to be shaped by various social and cognitive factors. Relevant cognitive processes, such as anxiety, have been observed to vary across linguistic and cultural contexts within bilingual individuals. This investigation sought to disentangle how language and cultural context contribute to pain perception among Spanish-English bilinguals. Bilingual participants experienced multiple types of painful thermal stimulations, both before and after language-congruent cultural priming, on separate English and Spanish testing days. Distinct behavioral and physiological pain outcomes were sensitive to either language or cultural context in a manner moderated by bilinguals' relative cultural dominance.

Specifically, pain intensity ratings and physiological responses within Spanish-speaking contexts were elevated for participants endorsing higher identification with Hispanic culture relative to US-American culture. Comparing across languages, bilinguals therefore exhibited greater pain in the language of their more dominant culture. However, Hispanic cultural priming reversed this relationship for explicit pain threshold and tolerance ratings. After priming, greater Hispanic dominance was associated with higher threshold and tolerance ratings in Spanish while these rating decreased after Hispanic priming among more US-American dominant participants. Speaking the language of one's dominant culture was associated with greater physiological arousal regardless of priming, potentially enhancing the sensory qualities (i.e. intensity) of pain. Conversely, explicitly activating this dominant cultural mindset increased bilinguals' motivation to withstand pain they could control. Thus, speaking a bilingual's preferred language may promote accurate pain diagnosis while coping could be enhanced in their less dominant language or via focus on their dominant culture.

190) Abstract 1763

THE IMPACTS OF RACE AND INFLAMMATORY CYTOKINES ON BIRTHWEIGHT IN THE NUMOM2B COHORT

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Racial disparities of low birthweight (BW) in the United States have been recognized as a significant public health issue, particularly for black women. However, the underlying mechanisms still warrant further research. Some studies demonstrate that an increased maternal prenatal inflammatory state associates with poorer pregnancy outcomes. Here, we investigate whether an increased maternal prenatal inflammatory state explains the association between race and lower BW.

We analyzed data from the 2010-2013 Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-be (nuMoM2b), a U.S. population level study of 10,000 nulliparous pregnant women. Sex-specific z-scores were calculated for BW, which also accounted for gestational age at birth, using a 2017 U.S. reference for singleton birth weight percentiles. Here, inflammatory cytokines were assayed from maternal serum across two pregnancy visits (13-16 weeks, 16-21 weeks) in a sample subset (n=762). Cytokines assayed included: GM-CSF, IFN- γ , IL-1b, IL-1RA, IL-2, IL-4, IL-6, IL-8, IL-10, and TNF- α , with concentrations being replaced by lab values for those falling below the limit of detection (LOD). After averaging over the two pregnancy visits and log transforming cytokine values, stepwise linear regression and mediation models were tested to examine respectively (1) the associations of race and inflammatory cytokines with BW, controlling for maternal age, socioeconomic status, smoking status, and pre-pregnancy body mass index, and (2) whether significant inflammatory cytokines resulting from the stepwise linear regression models mediated the association of race with BW.

The stepwise linear regression models revealed that race (white vs black), higher BMI and higher IFN- γ were associated with higher BW. GM-CSF was selected by the model, but was not significant. No other variables were selected by the models. Sensitivity analysis using multiple imputation for cytokine concentrations below the LOD showed similar associations (Table 1). No evidence for mediation was found.

These results replicate previous work demonstrating an association between race (black, white) and lower BW, and extend previous work by demonstrating that higher IFN- γ associates with higher BW. However, this result was found independent of race, suggesting that the pathway from race to lower BW does not include inflammatory cytokines.

Table 1. Stepwise Linear Regression Model

Variables	Lab Data		Imputed Data [^]	
	Estimate	P-value	Estimate	P-value
Intercept	-0.54	<.001	-0.46	0.003
Race				
Hispanic	-0.06	0.560	-0.05	0.580
Black	-0.49	<.001	-0.49	<.001
Asian	-0.09	0.680	-0.09	0.645
Other	0.12	0.496	0.09	0.604
White (reference category)	0.00		0.00	
Pre-pregnancy BMI	0.03	<.001	0.02	<.001
GM-CSF (pg/mL)	-0.10	0.101	-0.10	0.104
IFN- γ (pg/mL)	0.17	0.043	0.17	0.033

[^] Sensitivity analysis using imputed data for cytokine concentrations below limit of detection
BMI = body mass index

191) Abstract 1392

EVALUATING THE EFFECTS OF MATERNAL ANXIETY AND ACCULTURATIVE STRESS IN EARLY POSTPARTUM ON OFFSPRING'S INHIBITORY BEHAVIOR DURING THE PRESCHOOL AGE

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Symptoms of maternal stress during the postpartum period can have long-term effects on childhood behavioral outcomes. Some populations may be more at risk for this phenomenon as they are vulnerable to constant social cultural stressors that can perpetuate these symptoms as seen in Mexican-American women. Maternal anxiety and acculturative stress are factors that affect mother-infant relationships and bonding experiences. Maternal anxiety refers to the degree of excessive nervous and tense feelings while acculturative stress describes the experience of the adoption of a dominant culture. The need for research on this topic becomes greater as this population has become the fastest growing ethnic group in the United States within the recent years. The aim of this study is to assess early exposure to maternal anxiety in the early post-partum stage (45-47 weeks) on behavior inhibitory traits in preschool aged children with maternal postpartum acculturative stress as a moderator of the relationship. The population of interest is Mexican-American mothers (n=38) and their offspring (n=38). Mothers filled out surveys in early postpartum of anxiety (STAI) and acculturative stress (SAFE). A laboratory battery of early temperament (LabTAB) of the child was taken at 2.5-5 years of age. Behavioral inhibition in children was seen through levels of social interest and avoidant interactions during the LabTAB process. Simple slope analyses suggest, when mothers reported high acculturative stress and low anxiety postpartum, children demonstrated low social interest as preschoolers $b = .0028$, $SE(b) = .0013$, $t = 2.208$, $p = .0343$, 95% CI=[.0002, .0053]. When maternal acculturative stress was high and maternal anxiety was low, children demonstrated high avoidance $b = -.0046$, $SE(b) = .0018$, $t = -2.53$, $p = .016$, 95% CI=[-.0084, -.0009]. These findings emphasize the vital role of acculturative stress in postpartum and its influence on offspring's rate of behavioral inhibition. Results support the need for perinatal care programs that focus on reducing early exposure to certain stressors especially within vulnerable populations such as in Mexican-American families. Doing so, will provide for improvements in maternal perinatal mental health, as well as positive offspring behavioral outcomes.

Early Postpartum Maternal Anxiety and Acculturative Stress on Children's Social Interest

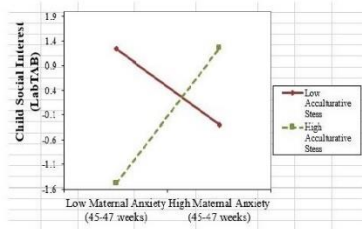


Figure 1. Depiction of maternal anxiety and acculturative stress in early postpartum on offspring's social interest behavior.

Submission ID: 1392

Early Postpartum Maternal Anxiety and Acculturative Stress on Children's Avoidant Behavior

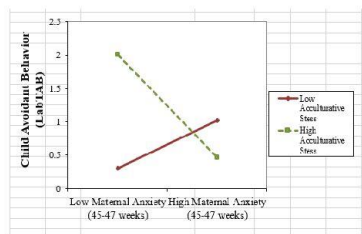


Figure 2. Depiction of maternal anxiety and acculturative stress in early postpartum on offspring's avoidant behavior.

192) Abstract 1881

PREGNANCY CORTISOL PATTERNS PREDICT POSTPARTUM WEIGHT RETENTION IN LOW-INCOME MINORITY WOMEN

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Numerous studies have evaluated the deleterious effects of physiological stress during pregnancy on health outcomes in both mothers and their infants. Few studies, however, have evaluated the role of physiological stress, as measured by the stress biomarker cortisol, on postpartum weight retention in low-income mothers and its implications for overall health. Cortisol is a hormone regularly used as a proxy for measuring perceived psychological and physiological distress (Fries, Dettenborn, & Kirschbaum, 2009) and cortisol patterns naturally alternate during the course of a woman's pregnancy with higher levels in the morning after waking and lower levels in the evening (Mastorakos & Ilias, 2003). However, abnormal alterations in cortisol patterns have been shown to be associated with weight retention postpartum (Straub et al., 2016). The current study seeks to examine the relationship between cortisol patterns in pregnancy and weight retention three months postpartum in a sample of 74 low-income, minority women. Participants were given a health assessment at baseline (i.e., first trimester) and three months postpartum to assess for current weight. Salivary cortisol was collected from each participant over four time points throughout the day (i.e., waking, 12pm, 4pm and 8pm) in the third trimester (i.e., 30-32 weeks gestation), and measured using a time-resolved immunoassay. Cortisol

patterns, or diurnal slopes, were recorded in the third trimester with higher scores indicating flatter slope patterns and lower scores indicating steeper slope patterns. Results of the multiple regression analysis showed that cortisol slope patterns significantly predicted weight retention, $R^2 = .06$, $F(1,73) = 4.43$, $p < .05$, in that flatter diurnal cortisol slopes (e.g., less cortisol pattern changes throughout the day) predicted higher weight retention at three months postpartum. Future studies should evaluate other predictors of weight retention in low-income minority women and their implications for future health outcomes.

193) Abstract 1421

HEARTRATE VARIABILITY AS A MEASURE OF INTEROCEPTIVE ABILITY

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Interoception is the sensing and monitoring of events and states of the internal body and its visceral organs, which is key in brain-body interaction, and has been linked to emotion regulation and psychiatric conditions like anxiety and dissociation. How well internal events, like the beatings of the heart, are consciously perceived vary between individuals, but precise evaluations of interoceptive ability is limited by a current lack of reliable tests. Common tasks for cardiac interoception include counting heartbeats, or discerning the synchronicity between heartbeats and external stimuli. Persistent issues with these tasks, like report bias and reliance on a priori awareness of one's heart rate, highlight the need for more refined tasks. This ongoing experiment tests a new measure of interoceptive ability, focusing on sensitivity to change in heart rate, where a person with high interoceptive ability should be able to accurately track changes in heart rate. Performance is compared to physiological recordings of blood pressure and heart rate variability, and subclinical dissociative scores. Preliminary results suggests a division between one group sensitive to trial-by-trial changes in heart rate, and another showing reduced performance at higher heart rates, signifying low interoceptive sensitivity.

194) Abstract 1729

JOHN HENRYISM ACTIVE COPING, AFFECTIVE RESPONSE, AND CARDIOVASCULAR REACTIVITY TO ANGER RECALL STRESS FOR AFRICAN AMERICAN MEN

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Objective. John Henryism active coping (JHAC), a measure of high-effort coping style and negative affective responses to mental stress, have each been linked with increased risk for cardiovascular (CV) disease especially for African Americans. However, little is known about how JHAC interacts with socioeconomic status (SES) to predict affective responses to psychosocial stressors. Thus, the objectives of the present study were to determine if 1) higher JHAC at lower education (a proxy of SES) is associated with increased negative and decreased positive affect in response to laboratory active speech and anger recall stressors and 2) if these negative affective responses moderate the role of JHAC and SES in CV stress responses.

Method. 73 healthy African American males aged 23 to 47 completed psychosocial surveys and a lab reactivity protocol with affective and continuous BP responses assessed for the following experimental tasks and related recovery periods: neutral reading, an active speech task and an anger recall task. Baseline-adjusted hierarchical multiple regression tests assessed mean positive and negative affect dimensions based on six dependent measures of momentary moods (positive: happy and content; negative: angry, annoyed, tense, and depressed), and mean

systolic and diastolic BP levels that were collected before the protocol and after each task and the post-active speech rest period. Mean affective reactivity scores (i.e., Task – Baseline) were created for positive and negative affect respectively at anger recall.

Results. The education by JHAC effect was significant for mean positive affect scores at post-anger recall, with increasing JHAC levels unexpectedly linked with *higher* mean positive affect at lower (but not higher) education levels. Surprisingly, higher JHAC and lower education was linked with less diastolic BP recovery to anger recall at *higher* levels of mean positive affect during anger recall.

Conclusions. Surprisingly, among African American men with low education, as JHAC increases after anger recall positive affect also increases; and this discordance is linked to elevated BP response to anger recall at higher positive affect. These results offer a novel means of how high JHAC and low SES may increase risk for CV disease by way of increased positive mood during stress.

195) Abstract 1896

EVALUATING PHYSIOLOGICAL ACTIVATION AS A MEDIATOR OF THE RELATIONSHIP BETWEEN PERSEVERATIVE COGNITION AND SOMATIC SYMPTOMS

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Somatic symptoms place a significant burden on health care systems, accounting for one-third of all medical visits. One proposed explanation for the development and maintenance of somatic symptoms posits that perseverative cognition results in prolonged physiological activation that is interpreted as somatic symptoms. The purpose of this study was to examine this hypothesis. First, we hypothesized that perseverative cognition would predict somatic symptoms. Second, we hypothesized that sympathetic nervous system (SNS) functioning, measured as electrodermal responding (EDR), would mediate this relationship. Finally, we hypothesized that parasympathetic nervous system (PNS) functioning, measured as respiratory sinus arrhythmia (RSA) mediate this relationship.

These hypotheses were tested in a sample of 220 young adults ages 18-39. The majority of participants were female (84.5%) and Caucasian (65.5%). Participants completed measures of perseverative cognition prior to a laboratory visit. During the laboratory visit, EDR and RSA were measured before, during, and after a stressor task to provide basal levels, reactivity to the stressor, and recovery from the stressor, respectively. Finally, somatic symptoms were measured over the next two weeks.

Data were analyzed using structural equation modeling. Confirmatory factor analysis was used to obtain adequate fit for measurement models prior to testing structural models. In both the EDR and RSA structural models, somatic symptoms were significantly predicted by perseverative cognition as expected (EDR: $\beta = 0.37$, $p = 0.003$; RSA: $\beta = 0.38$, $p < 0.001$). No other direct or indirect effects were observed. Post-hoc mediation analyses revealed that individuals who reported higher levels of perseverative cognition experienced greater increases in EDR during the stressor ($\beta = 0.17$; $p = 0.041$). In addition, RSA recovery significantly predicted somatic symptoms ($\beta = 0.16$; $p = 0.029$) such that individuals whose PNS failed to re-engage following the stressor reported a higher level of somatic symptoms.

The findings of this study suggest that perseverative cognition is related to sympathetic nervous system functioning, while parasympathetic nervous system functioning is related to somatic symptoms. Future research should examine EDR and RSA in the same model to capture the combined impact of SNS and PNS arousal on somatic symptoms.

196) Abstract 1821

RESTING HEART RATE VARIABILITY AND ITS RELATION TO RISK TAKING BEHAVIOR

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The current study explores the relationships between resting vagally mediated heart rate variability (vmHRV) and risk-taking behavior (RTB). RTB is defined as action which is positively associated with the chance of a loss. Resting vmHRV has been shown to index individual inhibitory capacity necessary to facilitate top-down attentional processing and executive functioning (e.g. activity of the dorso-lateral prefrontal cortex). Higher resting vmHRV has been previously shown to predict better performance on judgement and decision-making (JDM) tasks. Also, vmHRV and (RTB) have been shown to interact to predict JDM outcomes (e.g. gains vs. losses) such that RTB is associated with losses among individuals with low resting vmHRV, but not high resting vmHRV. However, to date, research has not examined how the association between vmHRV and RTB may across different domains. These relationships were explored in the current study in a sample of 79 subjects (52 females, mean age = 19 ± 1.54). Resting vmHRV was assessed via electrocardiogram during a 5-minute-resting period. RTB was assessed using the total of preferences toward Risk Seeking Behavior in three domains: certain gains vs. higher expected value gambles, certain gains vs. lower expected value gambles, and certain losses vs. lower expected value gambles. Controlling for important covariates, a significant positive association was found between resting vmHRV and RTB ($r = .309$, $p < .01$) in the domain of certain gains vs. lower expected value gambles (e.g. \$100 for sure or a 25% chance of \$200). Results suggest that individuals with higher vmHRV are more likely to engage in RTB than individuals with lower vmHRV when choices are low stakes, but not when they stand to gain a larger amount or lose any amount with certainty. Our findings support the Neurovisceral Integration Model and related work highlighting the role of brain regions associated with inhibitory control in JDM, in particular RTB. Our finding may also translate to health problems that are developed and maintained by poor inhibitory control and RTB, such as substance use and gambling disorders. Future research is necessary to determine if and when individuals with lower HRV may be more or less risky and to transfer the present findings to fields of research with implications for RTB in health-related decision-making.

197) Abstract 1918

HEART RATE TO CORTISOL RATIO IN RESPONSE TO PSYCHOLOGICAL STRESS IN LEAN AND OVERWEIGHT/OBESE MEN AGED 50-70 YEARS

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Background:

While sympatho-adrenal medullary (SAM) and hypothalamo-pituitary adrenal (HPA) responses to psychological stress are often dysregulated in overweight/obesity, we found no such dysregulation in overweight/obese vs lean men aged 50-70 years (1). Nevertheless, the relative reactivity of these pathways may reveal more about the integrated response to stress compared with testing each system alone (2). We hypothesised that the ratio of heart rate, a measure of SAM, over cortisol, a measure of HPA, (HRoC) and/or the ratio of cortisol over heart rate (CoHR) may assist in detecting dysregulation of stress system reactivity.

Methods:

Lean (BMI=20-25 kg/m²; n=19) and overweight/obese (BMI=27-35 kg/m²; n=17) men aged 50-70 years were subjected to a Trier Social Stress Test (TSST) at 1500h. Heart rate and salivary cortisol were measured every 7-15min from 1400h to 1700h. Data were analysed

using repeated measures analysis of variance with time as within-subjects factor and treatment (overweight/obese vs lean) as between-subjects factor.

Results:

Despite significant overall heart rate and salivary cortisol responses to the TSST (22% and 372%, respectively), these responses did not differ between lean and overweight/obese men for either system alone (1). When we considered reactivity of these pathways relative to one another, there were no significant differences between overweight/obese and lean men for either HRoC (time effect $p < 0.001$; time * treatment interaction $p = 0.912$; treatment effect $p = 0.506$) or CoHR (time effect $p < 0.001$; time * treatment interaction $p = 0.365$; treatment effect $p = 0.346$).

Conclusion:

HRoC or CoHR did not assist in detecting dysregulation of SAM and HPA reactivity to psychological stress in overweight/obese compared with lean men.

References:

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198) Abstract 1800

THE RELATIONSHIP BETWEEN RESTING HEART RATE VARIABILITY AND NEED FOR COGNITION: SEX AS A MODERATING FACTOR

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Resting high frequency heart rate variability (HF-HRV) serves as an index of self-regulation (e.g., emotion and cognitive regulation), such that those with lower resting HF-HRV show poorer emotional and cognitive control. However, research relating resting HF-HRV to motivations underlying emotion and cognitive regulation are scarce. We previously showed a negative association between resting HF-HRV and the motivation to avoid emotions, particularly in men. Moreover, we recently reported preliminary findings that showed lower resting HRV to be associated with a greater need for cognition (NC), defined as the motivation to engage in cognitive activities. The current study re-examines the direct relationship between resting HRV and NC in a larger sample, in addition to how sex may moderate this association. Using an electrocardiogram (ECG), 280 participants completed a continuous 5-minute baseline period in which HF-HRV was measured. Participants later completed the 18-item NC Scale; lower scores reflected lower NC. Controlling for important covariates, the full sample correlations did not show a significant relationship between resting HRV and NC ($r = -.032, p = .73$). Split by sex, correlations revealed a negative relationship between resting HF-HRV and NC in men ($r = .22, p = .04$) but not in women ($r = .05, p = .59$). Results showed sex significantly moderated the association between resting HF-HRV and NC ($\Delta R^2 = .019, B = 2.26 (1.13), [.03, 4.48], p = .047$), such that in men ($B = -1.68, (.81), [-3.28, -.08], p = .04$), but not women ($B = .57, (.79), [-.98, 2.12], p = .47$), lower resting HF-HRV was associated with greater NC. In line with our prior work on resting HF-HRV the need for affect, men with lower HF-HRV showed a greater motivation for NC. Such behavior seems maladaptive given the association between lower resting HF-HRV and poorer cognitive control; men with lower HF-HRV may tax their cognitive resources in seeking cognitive activities. In contrast, men with higher HRV are less likely to approach cognitive situations, thereby potentially reserving cognitive resource when needed; future research is required in this regard. Additional implications will be discussed.

199) Abstract 1793

SUBJECTIVE SLEEP QUALITY PREDICTS RESTING VAGALLY-MEDIATED HEART RATE VARIABILITY

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Background: There is increasing recognition of the intimate link between poor sleep and increased cardiovascular disease (CVD) risk which may have significant implications for both mental and physical health among African Americans (AA). Previous research indicates that AAs tend to exhibit greater vagally-mediated heart rate variability (HRV), an important biomarker of allostatic regulation, during both wake and sleep periods relative to European Americans. However, little research has examined within-group variability in the association between either objective or subjective measures of sleep quality and HRV in the former. **Objective:** The present study examined the relationship between subjective sleep quality and resting-state HRV in healthy African American men and women. **Methods:** One-hundred eighty-five ($N = 185$) participants completed the Pittsburgh Sleep Quality Index and a 5-minute baseline ambulatory electrocardiogram recording from which the root mean square of successive differences in adjacent R-R intervals (RMSSD) was obtained. **Results:** In a moderated regression analysis, sleep quality inversely predicted resting HRV ($B = -.12, SE = .03, p = .014$). This pattern differed for by sex such that sleep quality was more steeply related to resting HRV among men ($B = -.05, SE = .02, p = .030$), but not women ($B = .02, SE = .01, p = .17$). **Conclusion:** These findings novelly suggest that the relationship between poor sleep and increased CVD risk may not be uniform amongst African Americans.

200) Abstract 1102

ASSOCIATIONS BETWEEN STRESSFUL LIFE EVENTS AND PERCEPTIONS OF STRESS AND THEIR INTERACTIVE EFFECTS ON CARDIOVASCULAR RESPONSES TO ACUTE PSYCHOLOGICAL STRESS

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BACKGROUND: The stage model of stress combines epidemiological, psychological, and biological traditions to explain individual differences between stress and increased disease risk. Exposure to stressful life events (SLE), perceptions of stress (PS), and stressor-evoked cardiovascular reactivity (CVR) represent different processes of the stage model of stress: SLE are events that happen to individuals, PS are how individuals perceive events, and CVR represents biological responses to stressors. Studies have analyzed independent effects of the relationship between SLE, PS, and CVR with disease outcomes. Few studies have evaluated how the three traditions of stress may interact and/or relate to each other during the same acute psychological stress exposure.

AIM: To examine the association between SLE, PS, and their interactive effects on CVR to a standardized acute psychological stress task.

METHODS: Participants ($N = 118$) completed questionnaires about levels of PS (Perceived Stress Scale) in their life and recent SLE (Undergraduate Stress Questionnaire) followed by a 10-minute baseline period and 4-minute standardized mental arithmetic stress task. Heart rate (HR) was measured throughout the baseline period and stress task. Reactivity was the difference between average stress and average baseline values.

RESULTS: Bivariate correlations indicated a significant negative relationship between SLE and HR reactivity, $r(116) = -.249, p = .007$. PS was not significantly related to HR reactivity ($p = .162$). In regression analyses controlling for gender, race, and main effects of

each variable, the PS x SLE interaction was a significant predictor of HR reactivity, $\beta = .192$, $p = .034$, 95% CI [.001 - .020]. Individuals with low PS and high SLE exposure showed the most blunted HR responses to the stressor. Individuals with high amounts of PS, regardless of SLE exposure, reacted similarly with HR responses to the task stressor.

CONCLUSION: SLE may desensitize how individuals' biological systems respond to acute stress. However, the current study suggests the relationship is dependent on individuals' PS of these events. This demonstrates the importance of measuring both PS and SLE as suggested by the stage model of stress. Future research should evaluate how these unique stress traditions interact to predict future disease outcomes.

201) Abstract 1541

UNDERSTANDING RELATIONSHIP DOMINANCE FROM AN INTERPERSONAL PERSPECTIVE: PHYSIOLOGICAL AND BEHAVIORAL CONSEQUENCES OF RESTRICTIVENESS IN ROMANTIC RELATIONSHIPS

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Restrictiveness, a component of relationship dominance associated with monitoring and regulating partners' behavior, has been identified as a risk factor and accelerant of Intimate Partner Violence (IPV), but few studies have examined physiological and behavioral responses associated with restrictiveness *in vivo*. Using the biopsychosocial (BPS) model of challenge and threat as an organizing framework, we predicted that individuals high (vs. low) in restrictiveness would exhibit greater physiological and behavioral markers of approach-motivated challenge whereas their partners would exhibit more avoidance-motivated threat.

95 romantic couples ($N=190$) completed self-report measures of restrictiveness and were privately affixed to physiological sensors that measured challenge and threat (cardiac output, CO; total peripheral resistance, TPR). After a 5-min baseline recording, participants engaged in a video-recorded discussion in which one person (the *discloser*) revealed to their partner (the *responder*) that they had gotten hypothetical good news (getting a dream-job or into a dream-school).

Actor Partner Interdependence Model analyses were run to determine physiological and behavioral effects of restrictiveness on the self (actor) and their partner. Compared to baseline, actors high (vs. low) in restrictiveness exhibited greater challenge in anticipation of (TPR: $B = -36.13$, $t = -2.06$, $p = .041$, $r = .18$) and during the conversation (TPR: $B = -96.71$, $t = -3.07$, $p = .003$, $r = .25$, CO: $B = .40$, $t = 2.21$, $p = .028$, $r = 0.18$). Behaviorally, actors utilized more manipulative communication strategies, particularly when assigned to the responder role ($B = .44$, $t = 2.76$, $p = .006$, $r = .22$). Partners of actors high in restrictiveness exhibited a threat-oriented physiological profile in anticipation of (but not during) the conversation, particularly when they were assigned to the discloser role (TPR: $B = 56.20$, $t = 2.13$, $p = .035$, $r = .16$). No significant behavioral patterns were observed for partners.

By examining restrictiveness from an interpersonal perspective, the current study provides evidence that restrictiveness is associated with an approach-motivated profile for actors and an avoidance-motivated profile for partners. More broadly, findings have important implications for the BPS model of challenge and threat, theories of power in relationships, and IPV.

202) Abstract 1287

BEHAVIORAL DISENGAGEMENT AND CARDIAC VAGAL TONE AS PREDICTORS OF DEPRESSION

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Heart rate variability (HRV), also known as cardiac vagal tone, has a well-documented relationship with negative health outcomes including coronary heart disease and all-cause mortality. Fluctuations in HRV, both reactivity and a blunted HRV response, have been associated with depression. A key characteristic of those with depression is the utilization of maladaptive coping strategies. One maladaptive way of coping is known as behavioral disengagement, defined as a lack of participation, effort, or persistence while engaged in activities, or simply giving up. Behavioral disengagement is associated with increased levels of psychological distress, particularly depression. The purpose of this study was to examine the relationships among behavioral disengagement as a coping strategy, depressive symptoms and cardiac vagal tone during baseline, social and cognitive tasks and recovery conditions. Participants ($n = 95$, mean age = 20.77, $SD = 4.97$; 80% female; 40% European American) completed self-report measures including a demographic questionnaire, the Brief COPE, the Beck Depression Inventory-2 and a 30-minute physiological assessment. Bivariate correlations demonstrated that behavioral disengagement was negatively associated with cardiac vagal tone during cognitive recovery ($r = -.22$, $p = .03$) and social recovery tasks ($r = -.25$, $p = .02$), as well as depression ($r = .56$, $p < .001$). However, in regression analyses, cardiac vagal tone was positively associated with depression when including behavioral disengagement in the model for both social (Adj. $R^2 = .37$, $F(2, 87) = 26.74$, $p < .001$) and cognitive recovery tasks (Adj. $R^2 = .33$, $F(2, 88) = 23.21$, $p < .001$), even when adjusting for age, sex/gender and race/ethnicity. Given these results, we propose that individuals high in behavioral disengagement may have increased activity of their parasympathetic nervous system in an attempt to compensate for the emotional strain they are experiencing. The combination of maladaptive coping strategies paired with a strained physiological response may help to explain the link between depression and cardiovascular disease later in life. Future studies need to examine these constructs longitudinally across the lifespan.

203) Abstract 1772

IS PHYSICAL FITNESS ASSOCIATED WITH SPECIFIC POSITIVE AND NEGATIVE AFFECTS FOLLOWING A SOCIAL STRESSOR?

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Background: Exercise is a vital component of healthy living, and previous research found associations between exercise and a variety of benefits such as better mood, higher self-esteem, and reduced pain perception. Studies have also shown that physically fit individuals who often participated in rigorous exercise, displayed lower physiological responses to stressors. However, there is a lack of research on the association between physical fitness and the experience of specific positive and negative affect after exposure to social stressors.

Methods: Eighty-five participants (mean age=29.5, 64.5% female) were recruited from UCI and the surrounding region. During the first laboratory visit, participants reported several demographic measures and underwent a VO2 max Performance Test. Approximately one week later, they completed the Trier Social Stress Task (TSST). Following the TSST, participants submitted a self-reported state affect survey measuring the accuracy of various emotions at that moment (e.g., Happy, Unhappy, At Ease, On Edge, Calm, Tense). Bivariate

Pearson's correlations and multiple regression analyses were utilized to examine the associations between levels of oxygen intake and the post-stress effect on positive and negative emotions.

Results: Unadjusted analyses revealed that following stress, self-reported positive emotions such as Happy ($r(85)=0.331, p=0.002$), Calm ($r(85)=0.228, p=0.035$), and Relaxed ($r(85)=0.242, p=0.026$) were associated with higher VO₂ oxygen consumption (i.e., higher physical fitness). There was a negative association between feeling Tense and VO₂ ($r(85)=-0.226, p=0.037$), indicating that individuals who were more fit experienced fewer feelings of tension in the recovery period. Interestingly, when accounting for demographic factors like sex and age, the only association that held was between VO₂ and Happiness ($r(82)=0.260, p=0.017$).

Conclusion: The results suggest that individuals with higher levels of fitness experienced a more positive affect following social stressors, compared to those who were less fit. This was especially true for feelings of happiness, whose relationship with fitness was not altered by demographic variables. This data supports previous research showing a correlation between fitness and more positive moods, as well as revealing a unique association between fitness and specific types of affects.

204) Abstract 1252

ASSOCIATIONS BETWEEN MATERNAL PSYCHOLOGICAL CONTROL ETHNICITY, AND CORTISOL STRESS RESPONSE AMONG EMERGING ADULTS

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Background: Emerging Adulthood (approx. ages 18 to 25), often characterized by transition and stress (e.g., starting college, or entering the workforce), presents high risk for onset of anxiety and depression. Parental relationships can be a source of support or stress, as individuals become more independent. Maternal psychological control (PC) (attempts to control their child's psychological state via manipulation or guilt induction) has been linked to negative outcomes (e.g. anxiety and depression). However, given ethnic differences in parenting values and cultural differences in developmental goals related to individuation, parenting behaviors, such as PC, may have different implications across ethnic groups. Biomarkers of stress, such as cortisol, provide more objective measures of stress than self-reports, which may differ across ethnicity. This study aims to examine the association between PC and cortisol response during a social stressor and whether this link varies by ethnicity. **Method:** Data collection for this study is complete and analyses will be completed by January 2020. Participants were 95 non-Hispanic White (NHW, 22.1%), Asian American (27.4%) and Latinx (50.5%) emerging adults (ages 18-25, 74.3% female). PC was assessed using the 10-item subscale of the Child Report of Parental Behavior Inventory-30. Participants provided salivary cortisol samples before, during, and after the Trier Social Stress Test (speech and math), for a total of 5 samples per participant, 15 min apart. The dependent variables will be cortisol reactivity (i.e. the difference between baseline cortisol levels and peak salivary cortisol levels) and cortisol recovery (i.e. the difference between peak cortisol levels and cortisol levels after a recovery period). Interactions between PC and ethnicity (dummy coded with NHW group as reference) on these two outcomes will be tested using a hierarchical linear regression. **Anticipated results:** It is hypothesized that higher PC will be associated with higher cortisol reactivity during, and lower cortisol following the stress task and that these relationships will be stronger among NHW participants than the other two ethnic groups. **Implications:** These results may provide a useful basis to generate hypotheses regarding modifiable individual and social factors that can influence risk for poor mental health in this high-risk group.

205) Abstract 1878

PERSONALITY, IMMUNOMETABOLIC RISK, AND COGNITION IN MIDLIFE ADULTS

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Background: Cardiovascular, inflammatory, and autonomic factors associate with aspects of cognitive functioning, as do certain traits of personality. Previously, we showed that the Five-Factor Model (FFM) personality meta-trait of Stability (correlated variance of Agreeableness, Conscientiousness, and inverse Neuroticism) related to cardiometabolic risk, inflammation, cardiac autonomic control (low heart rate variability [HRV]), and physical activity. Here, we assess whether cognitive functioning also covaries with Stability and if any association may be accounted for by correlated variation in autonomic control, physical activity, and a latent index of immunometabolic risk.

Methods: Participants were 856 volunteers ($M=44.6 \pm 6.9$ years, range: 30-54; Female 54%; Caucasian 85%) from the Adult Health and Behavior (AHAB) registry. We used confirmatory factor analysis to estimate latent factors of Stability (from multiple informants), immunometabolic risk (from indicators of blood pressure; adiposity; glycemic control; blood lipids; inflammation [IL-6, CRP], and cognitive performance (episodic memory; executive function; working memory). Each cognitive factor was regressed on the individual personality traits and Stability. Indirect effects via immunometabolic risk, autonomic control (indicators: paced/unpaced HRV), and habitual physical activity (kcal/week expenditure) were assessed.

Results: Higher Stability was associated with better episodic memory ($\beta=0.15, p=0.04$), executive function ($\beta=0.33, p<0.001$), and working memory ($\beta=0.26, p<0.001$) performance. In addition, higher Stability was related to better executive function scores by an indirect pathway via greater physical activity levels and lower immunometabolic risk ($\beta=0.10, p=0.02$). HRV associated independently and positively with working memory ($\beta=0.09, p<0.05$).

Conclusions: Primary findings suggest that the FFM personality meta-trait of Stability relates to multiple dimensions of cognitive performance and, with respect to executive functioning in particular, hierarchically through greater amounts of physical activity and lower levels of aggregated immunometabolic risk. Future research might test whether higher Stability also predicts preserved cognitive functioning with aging, as mediated by these same mechanisms.

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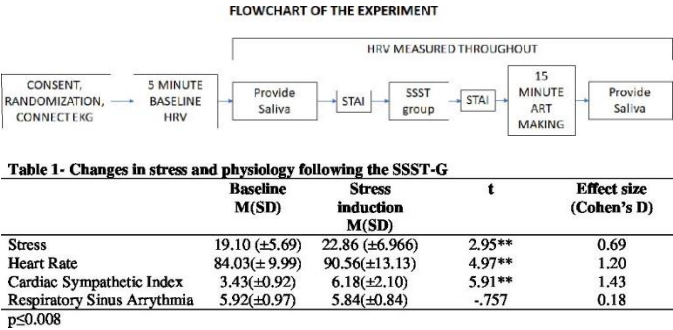
206) Abstract 1829

VALIDATION OF THE SING A SONG STRESS TEST IN A GROUP (SSST-G)

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Background: The SSST is a relatively new stress induction paradigm created to provide an alternative to the difficult to administer, gold-standard Trier stress test. In the SSST, participants are presented with neutral messages on a screen, with a final message to sing a song aloud. The SSST has been validated to be comparable to the Trier stress test in terms of eliciting social evaluative stress that also create changes in heart rate and skin conductance in individual participants. In this study, we modified the SSST to a group modality. **Methods:** Twenty-one individuals (16 females) between 18-43 were recruited. Participants were instructed not to consume alcohol or caffeine nor engage in vigorous exercise two hours before the experiment. In the lab, they were connected to a portable ECG device. After obtaining five minutes of resting ECG, participants provided saliva using a passive drool method and answered the State-Trait Personality Inventory, state anxiety subscale. Each participant viewed a PowerPoint presentation on a tablet with neutral fact sentences that randomly alternated every 40 seconds. One of the slides contained a "sing a song" instruction with

a 30 second countdown clock on the screen: "Think of a song you can sing aloud, when the timer reaches zero - stand up and sing the song in front of the group", after thirty seconds the words "sing now" appeared. After the powerpoint ended and all participants sang their song, participants filled out the state anxiety questionnaire again. Twenty minutes after stress induction saliva was again collected using passive drool (see flowchart). **Results:** Reported stress levels, mean heart rate and cardiac sympathetic index increased following the stress induction (see table 1). We did not find statistically significant changes in respiratory sinus arrhythmia or cortisol levels following the stress induction. However, difficulties in individualized timing of saliva collection may have masked actual cortisol changes 20 minutes after stress induction. **Conclusions:** SSST-G is a feasible method to induce social evaluative stress. Further, more accurate methods of measuring cortisol are needed to examine if the SSST-G is successful in activating the HPA axis following stress induction. The SSST-G is relatively easy to administer, however exact timing of the stress induction is difficult due to the group setting.



207) Abstract 1072
NEUROENDOCRINE COORDINATION AND YOUTH BEHAVIOR PROBLEMS: A REVIEW OF STUDIES ASSESSING SYMPATHETIC NERVOUS SYSTEM AND HYPOTHALAMIC-PITUITARY ADRENAL AXIS ACTIVITY USING SALIVARY ALPHA AMYLASE AND SALIVARY CORTISOL
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 Externalizing and internalizing behaviors can have deleterious psychosocial consequences for youth. Both sympathetic nervous system (SNS) and hypothalamic-pituitary adrenal (HPA) axis activity and reactivity may contribute to behavior problems but have largely been studied separately, with inconsistent findings. Because the SNS and HPA axis interact to carry out physiological processes (e.g., responding to stressors), considering SNS and HPA axis activity jointly may elucidate these disparate findings. This review discusses studies that simultaneously assessed SNS and HPA axis activity and youth behavior problems using measures of salivary alpha amylase (sAA) and salivary cortisol; several studies also examined the interactive (coordinated) associations between (re)activity in both systems and youth behavior problems. Multiple patterns of SNS and HPA axis coordination were associated with problem behaviors, especially when considering individual differences and youth's psychosocial context. Importantly, study findings may be artifacts of widespread methodological differences. The reviewed studies lay the foundation for future research on neuroendocrine coordination as a contributing factor to youth problem behaviors and have the potential to inform future interventions aiming to support youth at risk of behavior problems.

208) Abstract 1666
DEPRESSION AND CPAP ADHERENCE: A TWO-PART MODEL
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 Obstructive sleep apnea (OSA) is a prevalent sleep disorder with clinical symptoms leading to significant impairment. Non-adherence to CPAP, the primary treatment for OSA, is a well recognized problem. Depression has been found to predict non-adherence to numerous medical treatments and we hypothesized that it would predict lower levels of CPAP use.
 Participants were 373 veterans diagnosed with OSA at the Miami VA Sleep Clinic. After diagnosis with OSA, veterans received CPAP and average weekly minutes of use were tracked for 12 weeks. Diagnoses of depression was obtained from the medical record. Since CPAP adherence data tends to be non-normal, zero-inflated data, analysis was a two-part, latent curve model with both a binary (use or no use) and continuous outcome (minutes of use) modeled. The continuous model excludes non-users. Depression diagnosis was used to predict CPAP adherence controlling for pain, medical comorbidities, AHI, O₂ nadir, insomnia, and CPAP pressure.
 Logistic regression results indicate that there is tendency to become a non-user of CPAP over time (p=0.001). Being diagnosed with depression reduced the odds of using CPAP during the first week of treatment (p=0.007). However those with depression were no less likely to use CPAP than those without depression during the first 12 weeks of treatment (p=0.307). Linear regression results (excluding non-users) showed that depressed veterans used CPAP nearly 1 hour less (p=0.001) than non-depressed veterans at week 1 (3.95 vs 3.05hrs). Depressed veterans did not reduce their CPAP use over time (-0.64 minutes/week; n.s.), but non-depressed veterans did (-3.34 minutes/week; p=0.019).
 Our findings indicate that depression significantly impedes CPAP adherence. Those with depression are less likely to initiate CPAP and, if they do start treatment, use it less during the first week. However, depression did not predict the reduced odds of CPAP use over 12 weeks. Furthermore, Among CPAP users, those with depression had sustained use over time, unlike non-depressed veterans who reduced CPAP use over 3 months. These findings show that depression appears to have the largest impact at the initiation of CPAP. Intervention to improve CPAP adherence among depressed veterans may need to occur when CPAP treatment begins.

209) Abstract 1856
EFFECTS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON SLEEP QUALITY AMONG INSOMNIA AND OTHER CLINICAL POPULATIONS: A SYSTEMATIC REVIEW
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 Sleep disturbances are frequently observed among clinical populations, impacting negatively individual's well-being. They are mainly treated with medications and cognitive behavioral therapy, which are associated with side-effects and adherence issues,

respectively. Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive stimulation technique used to treat several conditions, and there is reason to believe that rTMS can improve sleep quality. This systematic review aims to assess the effects of rTMS on objective/subjective sleep quality measures among insomnia and other clinical populations. Databases searched were: MEDLINE, Web of Science, EBM, EMBASE, PsycINFO and Google Scholar. Inclusion criteria were: 1) adult patients diagnosed with chronic insomnia, or with any other disorder with sleep quality measured; 2) intervention with rTMS; 3) baseline and post-treatment sleep measures, and comparison with sham techniques if available; 4) use of objective (e.g., polysomnography [PSG], actigraphy) or subjective sleep measures (e.g., Pittsburgh Sleep Quality Index [PSQI], Insomnia Severity Index [ISI]). Risk of bias was evaluated with Cochrane Risk of Bias Tool for Randomized Controlled Trials. We screened 2127 references and 28 articles were included. Five articles targeted insomnia population, reporting all low-level frequencies protocols and stimulating right posterior, parietal, and left and right dorsolateral prefrontal cortex (DLPFC). All 5 studies used a high number of sessions (10-14) and showed positive and durable effects on different objective/subjective sleep quality measures. A total of 23/28 articles studied sleep in other conditions, including Parkinson (k=5), depression (k=6), or chronic pain (k=3). Main stimulation locations were DLPFC (k=6) and motor cortex (k=6). The majority used high frequencies (k=17) and a high number of sessions (10-30). Overall, 16/23 studies reported sleep improvement. Reported side-effects were minor and transient. Risk of bias was considerable high in the majority of the studies (13 were uncontrolled). Thus, rTMS is a safe technique that can improve sleep quality among insomnia and other clinical populations. Additional research efforts are needed to reduce bias, improve quality of the studies, and characterize optimal brain stimulation parameters to promote rTMS efficacy when treating sleep disturbances.

210) Abstract 1143

BEING INTERDEPENDENT MODERATES REACTIVITY TO INTERPERSONAL STRESS

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Background: A growing body of literature examines cultural differences in the impact of stress on psychological health. However, much of this research focuses on comparisons between two ethnic groups without directly measuring the cultural values of group members. The current analysis examines whether the impact of certain types of daily stressors on mood is moderated by having an interdependent self-construal, a cultural value that represents how much an individual defines the self by their close relationships.

Methods: Data were used from two subprojects of the Midlife in the United States (MIDUS II) project: the Biomarker Project and the National Survey of Daily Experiences. A total of 1,007 participants completed the measure of self-construal. Participants reported type of stressor, negative affect, and positive affect on 8 consecutive days. Types of stressors included having an interpersonal conflict, avoiding an interpersonal conflict, and having a conflict at work. Multilevel modeling was used to examine whether interdependent self-construal moderated the effect of type of stressor on negative and positive affect. **Results:** On days when participants experienced an interpersonal conflict, participants high in interdependence reported greater negative affect than participants low in interdependence ($p = .02$). In contrast, on days when participants avoided an interpersonal conflict, participants high in interdependence reported less negative affect than participants low in interdependence ($p = .03$). There was no interaction between work conflict and interdependence on negative affect. Regarding positive affect, participants high in interdependence reported greater positive affect regardless of stressor (p 's < .001).

Conclusion: Self-construal affects the daily impact of interpersonal stress on psychological well-being. Future research should examine whether cultural values moderate the effect of reactivity towards interpersonal stressors on long-term health outcomes.

211) Abstract 1387

THE ASSOCIATION BETWEEN NEIGHBORHOOD SOCIAL COHESION AND INSOMNIA IN LATINOS, AS MODERATED BY NATIVITY STATUS AND ENGLISH LANGUAGE PROFICIENCY

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Introduction: Neighborhood social cohesion (NSC) has been linked to sleep health in United States (US)-born samples, but the association remains unclear in immigrant groups. Though immigrants tend to experience better health compared to native-born counterparts and some have hypothesized this may be due to greater NSC, evidence is mixed on whether this is true across markers of acculturation. We investigated the moderating role of acculturation markers (nativity status and English language proficiency[ELP]) on the relationship between NSC and insomnia symptoms and sleep quality.

Methods: Using cross-sectional data from 143 healthy Latino adults in the Latino Sleep and Health Study, two separate sets of regression models were used to assess moderation of the relationship between NSC and sleep outcomes by nativity status or ELP. In the first sets of models, we regressed high NSC (dichotomous, top tertile vs. all else) on insomnia and sleep quality, as measured by the Insomnia Severity Index[ISI] (continuous) and The Pittsburgh Sleep Quality Index (continuous). In remaining models, interaction terms—nativity status (dichotomous) x NSC and ELP (dichotomized) x NSC—were added with four covariates (i.e. age, gender, education, stress).

Results: Participants were 62.94% female with a *Mean* age of 39.70 (SE=1.22), and 38.46% completed less than a bachelor's degree. In the fully adjusted model for insomnia, the interaction term was significant ($p=0.03$), but main effects were not. For US-born, in the final model, for every point increase in high NSC there was a 0.61 (SE=0.28, $p=0.04$) point decrease in ISI. For immigrants, the association between high NSC and insomnia symptoms was not statistically significant. In the fully adjusted model for sleep quality, the interaction approached significance ($p=0.08$). ELP had no significant interaction effect in models with either sleep outcome.

Conclusion: The effects of NSC on sleep health differ by nativity status, but not by ELP. These results suggest that NCS may facilitate access to resources and better sleep differently depending on the acculturation marker. Future research should explore differences in protective effects of NSC on sleep health by individual level characteristics (e.g. country of origin, length of residence in the neighborhood) and neighborhood characteristics (e.g. ethnic composition, neighborhood turnover).

212) Abstract 1617

PARENT-CHILD RELATIONSHIP QUALITY, TRAIT AFFECT, AND DIET IN THE PARENT-CHILD DYAD

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Previous literature suggests that both parent-child relationships and positive emotions can impact children's dietary habits. Greater parent-child relationship quality and parent-child connectedness has been found to be related to lower frequency of eating fast food and engaging in unhealthy eating among adolescents. However, to our knowledge, the relation between parent-child relationship quality in terms of attachment security and children's diet has not been examined. Additionally, positive affect is linked to physiological outcomes such as heart rate, blood pressure, and inflammation, however, little is known about whether attachment security is linked to children's diets. The goal of this study was to examine the relation between children's trait affect and parent child relationship quality as it relates to children's diet. Participants were 36 mother-child dyads, with children ranging in age from 8 to 12 years. The dyads completed self-report questionnaires that measured their trait affect, diet, and parent-child relationship quality. We hypothesized that higher parent-child relationship quality would be associated with lower sugary food

consumption in children. Additionally we hypothesized that children's positive trait affect would be associated with greater whole grain food consumption. Linear regression analyses revealed that the mother-child bond was a negative, significant linear predictor of sugary food consumption [$b = -.35$, 95% CI (-1.71- -.017), $t(32) = -2.08$, $p < .05$]. Further, trait positive affect was a positive, significant linear predictor of whole grain food consumption [$b = .42$, 95% CI (.101-.704), $t(35) = 2.71$, $p = .01$]. These findings suggest that positive emotions and higher parent-child relationship quality may be associated with children's diet. These results may have important implications for children's physical health during childhood; discussion will focus on the mechanisms by which high quality parent-child relationships may promote healthy eating behaviors in the long-term.

213) Abstract 1686

AUTOMATIC QUANTIFICATION OF LANGUAGE FEATURES FOLLOWING PSILOCYBIN ADMINISTRATION: A PILOT STUDY

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Background: Speech analysis is increasingly applied to objectively and quantitatively assess psychiatric symptoms. We used automated linguistic classification to explore whether speech samples after high-dose psilocybin treatment can predict sustained reductions in depressive symptoms among Long-term AIDS Survivors (LTAS). LTAS are people with HIV diagnosed prior to the advent of highly active antiretroviral therapy and experience high rates of psychiatric symptoms including depression, PTSD, and demoralization. Psilocybin is a 5-hydroxytryptamine (5-HT) receptor agonist that can induce multiple subjective effects including intensified affective responses, enhanced ability for introspection, and activation of vivid memories, that has shown promise for improving mood symptoms. **Methods:** In this exploratory analysis, we examined recorded speech data from an open-label pilot study of psilocybin-assisted group therapy for LTAS with moderate-to-severe demoralization (i.e. helplessness, hopelessness, and a loss of meaning and purpose in life). Participants completed an individual psilocybin administration session (0.3mg/kg orally) and an individual interview about their experience one day following the session. We used the Center for Epidemiologic Studies of Depression Scale-Revised (CESD-R) to assess depressive symptoms at baseline and three months following psilocybin administration. We used Linguistic Inquiry Word Count, an automated method for quantifying language properties from text, to analyze transcribed interviews. **Results:** Of 18 people who completed the trial, 16 participated in follow-up at three months. We found an overall decrease in depressive symptoms (CESD-R mean difference=-11.37, SD=8.00, $p=.0004$, Hedge's $g=1.03$). Analysis of interview transcripts showed associations between decreased depressive symptoms and participants' use of language indicating 1) a focus on the past ($r=.50$, $p=.048$); and 2) insight ($r=.43$, $p=.095$). We did not find an association between decreased depressive symptoms and participants' use of affective language (indicating positive and negative emotion). **Conclusions:** Language features may be useful for predicting clinical response to psilocybin treatment, and automated speech analysis offers a cost-effective assessment method. Given the exploratory nature of this small pilot study, significant further investigation is needed.

214) Abstract 1141

THE RELATIONSHIP BETWEEN SELF-COMPASSION AND PERCEIVED STRESSORS AMONG MULTI-ETHNIC YOUNG ADULTS WITH INCREASED RISK FOR TYPE 2 DIABETES

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Background: Psychosocial stressors including perceived discrimination may associate with a higher risk of developing health problems like increased adiposity, Type 2 diabetes (T2D), and heart disease. Mounting research indicates that positive psychological traits such as self-compassion, or extending oneself compassion when suffering, may be associated with lower perceived stressors. The aim of this study is to investigate the relationships between self-compassion, perceived stress, and perceived discrimination among a unique, high-risk, multi-ethnic sample of young adults with a predisposition to Type 2 diabetes.

Methods: An on-going pilot study conducted by the Metabolism and Stress Assessment Lab (MeSA) is recruiting young adults with a family history of Type 2 diabetes ($n=24$ to date of 100 expected). Participants completed the 26-item Self-Compassion Scale (SCS-26), 10-item Perceived Stress Scale (PSS-10), and 10-item Everyday Discrimination Scale (EDS). Spearman's Correlation tests were used to assess these relationships in preliminary analyses. Future analyses will adjust for potential confounders including age, sex, and ethnicity.

Results: Preliminary data ($n=24$) showed a mean of 21.33 years ([range] = 18-25); 56.5% Hispanic or Latino/a, 17.4% Asian (Pacific Islander), 13% Caucasian, 8.7% African American or Black, 4.3% Asian (non-Pacific Islander); 66.7% female. SCS scores were negatively correlated with PSS scores ($r = -0.48$, $p = 0.02$), and EDS scores ($r = -0.49$, $p = 0.02$).

Conclusions: Preliminary results suggest that individuals exposed to higher self-compassion may have lower perceived stress and perceived discrimination. Further data collection is required to determine if an association will persist. If an association remains consistent, it may propose that self-compassion, kindness turned inward, may act as a protective factor against psychosocial stressors among young adults with additional increased risk of T2D.

215) Abstract 1619 will not be published

216) Abstract 1512

ALLOSTATIC LOAD AND HAIR CORTISOL IN A SAMPLE OF HEALTHY POSTPARTUM WOMEN

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Background

Few studies have examined the significance of biologic measures of stress in the postpartum period. In this study, we evaluated both allostatic load (AL) and postpartum hair cortisol in a sample of healthy postpartum women. We hypothesized that 1) there are demographic differences in AL consistent with previous work in AL and 2) hair cortisol is associated with AL.

Methods

Participants were recruited in the postpartum period and completed three visits. For AL, we used data from the 3 to 4 month postpartum visit. We divided ten components of AL among cardiovascular, metabolic, and inflammatory domains and calculated AL as the sum of the proportion of high risk components for each domain. Total AL score could range from 0 to 3. We used clinical cut-offs for the cardiovascular and metabolic components and high risk quartiles for inflammatory components. For hair cortisol, we collected hair samples at each visit. Hair samples were measured and cut to correspond to time periods based on a standard rate of hair growth. Cortisol was

extracted and measured using salivary cortisol kits. We used t-tests to test for differences in AL between racial/ethnic groups (non-hispanic white vs. non-white), annual household income (<\$40,000 vs. ≥\$40,000), and education (college degree vs. no college degree). We used Wilcoxon rank-sum tests to test differences in postpartum hair cortisol between high and low AL groups.

Results

Forty women met criteria for inclusion and had data for AL with mean AL 0.583 +/- 0.436. Half self-identified as non-hispanic white (50%). Most had a college degree (73%). Thirty-four percent had annual household income <\$40,000. There were no differences in AL between non-hispanic white vs. non-white, annual household income <\$40,000 vs. ≥\$40,000, or college degree vs. no college degree. There was no difference in median postpartum hair cortisol between the high and low AL groups (35.5 [5.6-119.1] vs. 30.0 [5.4 - 94.8] , $p=0.77$).

Conclusions

There were no differences in AL between demographic groups and no association between hair cortisol and AL. It is unclear whether the lack of significant findings originate either from physiology or from the postpartum period that mitigate differences in AL and cortisol or from a need for a different model for capturing AL in postpartum women.

217) Abstract 1361

MEASURING THE MULTIPLE DIMENSIONS OF MEDICATION ADHERENCE

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Background. Consensus on establishing a gold-standard measure of medication adherence has been elusive, in part because medication adherence involves multiple behaviors that span initiation, implementation, and persistence. Different measurement approaches may be better suited to assess different behaviors. We sought to achieve expert consensus on defining medication nonadherence behaviors and identifying suitable and optimal measurement approaches for each behavior.

Method. Thirty experts with an international reputation in medication adherence research and/or intervention were invited to participate in a Delphi panel involving two sequential online surveys. Survey 1 ($n = 24$) sought to identify and define nonadherence behaviors and associated measurement approaches. Results from the first survey were used to refine the behaviors and approaches for a subsequent survey. Survey 2 ($n = 22$) sought to assess the suitability of each approach and the optimal approach for each behavior.

Results. Across the two surveys, respondents agreed with the specification and definition of eight of nine proposed nonadherence behaviors: not filling the initial prescription, not taking the first pill, missing doses, taking extra doses, refilling medication late or not at all, improperly administering medications, and discontinuing medications early. Additionally, respondents agreed with the specification and definition of seven of eight measurement approaches: patient report, prescription refill, dose or pill count, electronic drug monitoring, drug or drug metabolite level, ingestible sensor, and direct observation. They also suggested the addition of proxy report. In survey 2, there was consensus that multiple approaches were at least somewhat suitable for measuring each nonadherence behavior. Consensus on an optimal approach was reached for only two behaviors—not refilling the initial prescription and filling it late—both via the method of prescription refill records. Self-report was rated suitable for measuring all behaviors but optimal for none.

Discussion. This framework of nonadherence behaviors and measurement methods can be used to guide selection of measurement approaches within adherence studies and as a basis for evaluating the availability of valid measures for assessing distinct nonadherence behaviors.

218) Abstract 1485

LONGITUDINAL DECREASES IN NEGATIVE MOOD PREDICT IMPROVED CORTISOL REGULATION OVER TIME IN 5+ YEAR OVARIAN CANCER SURVIVORS

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Longitudinal relationships between psychosocial and biological factors in long-term ovarian cancer survivors have been poorly characterized. Among ovarian cancer patients, who generally have a poor prognosis, 29%-38% experience significant anxiety and 21-25% experience clinical levels of depression at diagnosis. Less is known about the persistence of negative mood states over time in 5+ year cancer survivors, potential buffering factors, and whether negative mood is associated with dysregulation in biological systems, such as diurnal cortisol. To address this issue, we examined persistence of negative mood over time in 5+ year survivors of ovarian cancer, potential protective psychosocial factors affecting persistent negative mood, and prospective longitudinal relationships between negative mood and diurnal cortisol rhythms. Participants ($n=32$) completed questionnaires assessing psychosocial factors (POMS-SF anxiety subscale, CES-D, SPS, and FACIT-Spirituality) and collected salivary cortisol pre-surgery, post- chemotherapy (6-months), and at 12-months and 5+ years post-diagnosis. Linear-mixed models examined associations between trajectories of psychosocial factors and cortisol slopes over time, and included age, cancer stage, and use of psychotropic medication as covariates. Both anxiety and depression decreased significantly from pre-surgery to 6 months ($p<0.001$) and were stable from 6 months to 1 year (ns) and 1 year to 5 years (ns). In models including all timepoints, decreasing anxiety over time mirrored increasingly steep trajectories of cortisol slope over time, indicative of a healthier diurnal cortisol pattern ($\beta=0.116, p=0.048$). Similarly, decreasing depression over time paralleled steeper trajectories of cortisol slope over time ($\beta=0.179, p=0.017$). Increased spirituality ($\beta=-0.167, p<0.001$) and social support ($\beta=-0.137, p=0.003$) over time each independently predicted decreased depression over time, but did not significantly predict changes in anxiety or changes in cortisol slope. These findings do not address directionality or possible causality between mood and cortisol dysregulation, but help identify potential targets for psychosocial interventions in 5+ year survivors. Further examination of mechanisms underlying these results is warranted to assist in identifying individuals most in need of behavioral or therapeutic intervention.

219) Abstract 1865

PATIENT-CAREGIVER RELATIONSHIP QUALITY PREDICTS QUALITY OF LIFE 6-MONTHS TO 1-YEAR AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANT TREATMENT FOR HEMATOLOGICAL CANCER IN A PROSPECTIVE LONGITUDINAL STUDY

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Allogeneic hemopoietic stem cell transplant (allo-HSCT) is a life-saving procedure that entails significant treatment-related risks and mortality. As survival after allo-HSCT improves, quality of life (QoL) has become a critical patient (Pt) reported outcome, linked with relapse and mortality. Given the intensity of treatment, allo-HSCT Pts must designate a caregiver (CG) to assist their post-transplant care. Both Pt and CG mental health is known to predict Pt QoL. However, little research investigates the role of relationship quality in Pt outcomes. Since the Pt-CG relationship is a primary source of social support, we hypothesized that better relationship quality would be related to better Pt QoL either directly or by buffering association of poor mental health with Pt QoL. Pt mental and physical QoL (SF-36), Pt depression (Hospital Anxiety and Depression Scale), and Pt and CG relationship quality (Dyadic Adjustment Scale) were assessed at multiple time points from 7-10 days pre-transplant through 6 months (6M) and 1-year (1Y) post-transplant in a sample of 76 Pts (mean age 53.8yrs, 35% female) and 75 CGs (51.9yrs, 73% female). Analyses controlled for Pt age, sex, education, transplant type, conditioning regimen, pre-transplant cytomegalovirus serostatus, and medical comorbidities. Relationship quality was not related to Pt QoL outcomes at time points before 6M. However, both Pt- and CG-reported relationship quality at 6M predicted Pt mental health QoL at 1Y (Pt: $\beta=.381, p=.029$; CG: $\beta=.415, p=.015$). Pt relationship quality at 1Y continued to predict Pt mental health QoL at 1Y ($\beta=.383, p=.018$). There were no direct effects of relationship quality on physical health QoL. However, Pt relationship quality at 6M buffered the association between Pt depression at 6M and Pt physical health QoL at 1Y (interaction: $\beta=.313, p=.029$), such that if the relationship was better, the depression-QoL association was weaker than if the relationship was poorer. Our findings suggest that Pt-CG relationship quality at 6 months and 1-year post-transplant may be particularly important for Pt mental and physical QoL. As the frequency of medical intervention winds down, the Pt-CG relationship may have greater importance for Pt QoL outcomes. Future psychological interventions could target Pt-CG relationship quality during this time period to improve long term survivorship outcomes.

220) Abstract 1239

ASSOCIATIONS OF TRAIT FORGIVENESS WITH ADJUSTMENT TO ILLNESS AND RELATIONSHIP OUTCOMES AMONG BREAST CANCER SURVIVORS

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Evidence suggests that dispositional forgiveness is associated with more favorable psychosocial adjustment. However, research in oncology has been limited. In this cross-sectional investigation, we examined associations between trait forgiveness and 2 types of psychosocial outcomes among breast cancer survivors: (1) relationship functioning, and (2) adjustment to illness. It was expected that a stronger disposition toward forgiveness would be related to more favorable relationship outcomes, and more speculatively, to better adjustment to illness.

The sample included nonmetastatic breast cancer survivors participating in a larger study, who were evaluated a minimum of 6 months since treatment completion (except endocrine therapy) and who were in married/committed relationships. Mean age was 58.1 years, mean time since diagnosis was 3.4 years, and 70.1% were receiving endocrine therapy. Forgiveness was assessed with the Trait Forgiveness Questionnaire. We assessed several distinct relationship outcomes: marital adjustment (Brief Dyadic Adjustment Scale), negative interactions (Social Constraints Scale), and sexual interest (PROMIS). Psychosocial adjustment outcomes included illness-related helplessness, acceptance, and benefits (Illness

Cognition Questionnaire) and general emotional distress (Brief Symptom Inventory).

In bivariate analyses, greater trait forgiveness was related to significantly better marital adjustment ($p=.01$) and fewer social constraints ($p=.04$), though it was unrelated to sexual interest ($p=.60$). Forgiveness was also associated with significantly greater acceptance of the illness ($p=.03$); it was not related to perceived benefits, helplessness, or general distress. In separate multiple regression models that adjusted for prior chemotherapy and other significant clinical/demographic covariates, forgiveness remained associated with better marital adjustment ($\beta=.44, p=.01$), fewer social constraints ($\beta=-.43, p=.01$), and greater illness-related acceptance ($\beta=.33, p=.04$).

Results highlight the role of dispositional forgiveness as a potential resource among breast cancer survivors, which perhaps might contribute to more favorable relationship outcomes and a greater sense of acceptance of the illness. Further research using longitudinal designs and larger samples would help clarify temporal relationships.

221) Abstract 1011

THE IMPACT OF AEROBIC TRAINING ON CARDIOVASCULAR REACTIVITY TO AND RECOVERY FROM CHALLENGE

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Objective: Consensus guidelines recommend exercise for primary prevention of cardiovascular (CV) disease. Evidence suggests that elevated CV reactivity to, and reduced recovery from, challenging events may increase the risk of CVD and that exercise training reduces this reactivity. However, in a randomized controlled trial (RCT) of aerobic vs. strength training in sedentary, healthy young adults, we found no training group differences in reactivity or recovery. Because strength training also may have a reactivity-reducing effect, we conducted another RCT, this time contrasting the effect of aerobic training to a wait list control condition.

Methods: 119 healthy, young, sedentary adults were randomized to a 12-week aerobic training program or a wait-list control. Before (T1) and after (T2) training and again after 4 weeks of sedentary deconditioning (T3), we measured heart rate (HR), heart rate variability (HRV), and blood pressure (BP) at rest and in response to and recovery from psychological and orthostatic challenge. Data were first analyzed using a treatment group (aerobic vs. waitlist) by session (T1, T2, and deconditioning), by period (baseline, Stroop/math, recovery, standing) 3-way ANOVA with prespecified contrasts of the effect of group assignment on reactivity and recovery. The data were then analyzed using the same method but adjusting for within-session baseline period.

Results: Aerobic capacity significantly increased at T2 and decreased at T3 in the aerobic training but not waitlist group. However, the two groups did not differ on HR, HRV, or BP reactivity to or recovery from laboratory challenge. Without baseline adjustment, the 3-way interaction was not significant for any of the outcomes, suggesting no treatment differences in change in response to challenges. With baseline adjustment, there was a significant treatment by session effect for reactivity only to orthostatic challenge for HR, SBP, DBP, and RMSSD: at T2, reactivity to orthostatic challenge in the aerobic training group was reduced, but not significantly, compared to T1. However, in the waitlist group, reactivity to orthostatic challenge significantly worsened after T1.

Conclusions: These findings confirm previous findings and raise doubts about attenuation of CV reactivity or enhancement of recovery as a mechanism underlying the cardioprotective effects of aerobic exercise.

222) Abstract 1660

AMBULATORY BLOOD PRESSURE MEAN AND VARIABILITY ARE INDEPENDENT PREDICTORS OF LEFT VENTRICULAR MASS

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Background: Ambulatory blood pressure (ABP) mean predicts cardiovascular disease, as does ABP variability. Yet, past research presents mixed findings in determining whether each has independent effects. Little work has systematically examined whether systolic and diastolic BP mean and variability during daytime and nighttime periods could explain why mixed findings have been found. Testing if ABP variability has unique predictive power to ABP mean would further suggest it as a target for pharmaceutical interventions to prevent disease. **Objective:** The present study tests whether ABP mean and variability differentially predict a marker of cardiovascular disease – left ventricular mass. **Method:** Participants ($n = 171$; 57.9% female; $M \pm SD_{age} = 53.97 \pm 14.52$; 54.97% non-Hispanic Caucasian) were recruited from the New York City area. They were fitted with SpaceLabs ABP monitors with ABP readings taken every 30 minutes over a 36 hour period; this procedure was completed three times, a month between each measurement session. Left ventricular mass was measured using M-mode and two-dimensional echocardiograms. **Results:** Daytime and nighttime systolic and diastolic BP were compared for both ABP mean and variability. Bivariate and partial (controlling for sex, age, race, and BMI) correlations suggested that all the ABP measures related to left ventricular mass, with the ABP mean variables showing stronger relationships than ABP variability. Multivariate regressions simultaneously testing ABP mean and variability measures suggest independent relationships for each, notably daytime systolic mean and daytime systolic and diastolic variability. **Conclusions:** These findings add to the growing evidence that ABP mean and variability are each uniquely important risk factors.

223) Abstract 1902

INTERPERSONAL ACCEPTANCE AND CARDIOVASCULAR RISKS AMONGST ROMANTIC PARTNERS: THE BUFFERING EFFECT OF SELF-ESTEEM

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Objectives: Feeling accepted by the romantic partner is desirable, and the lack thereof constitutes life stressor that harms both psychological and physical health. People often automatically infer rejection versus acceptance from their partner's negative behaviours. However, such automatic inclination to associate the partner's negative behaviours with rejection can increase cardiovascular risks for both dyadic members in a long-run. Global self-esteem, as a psychological resource, may counteract the negative influence of this inclination on health. This research tested these ideas.

Method: A total of 66 dating couples engaged in a 21-day dyadic daily diary study, in which both members reported how many negative behaviours they observed their partner engaged everyday (viz., observed negative behaviours), and to what extent they believed these negative behaviours were indicative of their partner's rejection towards the self (viz., perceived diagnosticity). Participants completed Rosenberg Self-esteem Scale two weeks before the diary session, and their resting systolic and diastolic blood pressure was measured one month after the diary session.

Results: Multilevel structural equation models coupled with actor-partner independence approach were applied to test these pathways. We found that inferring a partner's negative behaviours as diagnostic of rejection was associated with higher resting diastolic blood pressure one month later, and this effect could be moderated (or buffered) by global self-esteem. Specifically, actors' perceiving more diagnosticity in their partners' negative behaviours predicted higher resting diastolic

blood pressure for low but not high self-esteem actors. Similarly, partners' perceiving more diagnosticity in actors' negative behaviours predicted higher resting diastolic blood pressure for actors with low but not high self-esteem partners.

Conclusion: Frequently perceiving the romantic partner's negative behaviours as indicating rejection may increase cardiovascular risks for both dyadic members, and global self-esteem serves as an effective buffer against such psychosocial health-compromising effects.

224) Abstract 1123

AMBIVALENCE IS RELATED TO REDUCED PHYSICAL ACTIVITY AND EXERCISE TOLERANCE AMONG ADOLESCENTS WITH CONGENITAL HEART DISEASE

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BACKGROUND: Physical activity (PA) is associated with improved functional outcomes and quality of life among individuals with congenital heart disease (CHD). However, adolescents with CHD are less physically active than their healthy peers, potentially elevating their risk for morbidities as they age into adulthood. Adolescents' attitudes regarding PA have received little attention, although ambivalent attitudes may hinder engagement in PA. The purpose of this study was to characterize the relationship between ambivalence and PA among adolescent CHD survivors.

METHODS: Adolescents aged 15 to 19 years with moderate to complex CHD ($N = 72$) underwent a baseline assessment of PA to determine eligibility for a randomized clinical trial. Participants completed measures of benefits of and barriers to PA, self-efficacy to engage in PA, social support and norms related to PA, and reported their history of organized sport involvement. Mean scores on the benefits and barriers measures were used to calculate an index of ambivalence. Possible scores ranged from -1 (low ambivalence) to 5 (high ambivalence). Participants underwent an exercise stress test to determine their exercise tolerance (VO_{2max}) and wore an accelerometer around their waist for one week as a measure of moderate-to-vigorous PA (MVPA).

RESULTS: On average, participants reported a low to moderate degree of ambivalence about PA ($M = 1.3$, $SD = 1.4$, range = -1.0 – 3.4). Ambivalence was negatively associated with both time spent in MVPA ($r = -0.34$, $p = 0.01$) and VO_{2max} ($r = -0.62$, $p < 0.01$). An ANOVA ($p < 0.01$) revealed differences in ambivalence by history of sport involvement, with follow-up analyses ($p < 0.01$) indicating that participants who have never participated in sports ($M = 2.0$, $SD = 1.1$) are more ambivalent than participants currently involved in sports ($M = 0.7$, $SD = 1.3$). Furthermore, ambivalence was negatively related to contributors of health behavior engagement, including self-efficacy ($r = -0.70$, $p < 0.01$), social support ($r = -0.40$, $p < 0.01$), and social norms ($r = -0.25$, $p = 0.04$).

CONCLUSIONS: Greater ambivalence is associated with reduced PA and exercise tolerance among adolescents with CHD. Future research should examine ambivalence as a predictor of PA, as well as develop and test interventions to resolve ambivalence, thereby minimizing morbidity and enhancing quality of life.

225) Abstract 1210

PERCEIVED HEALTH, SOCIAL SUPPORT AND LIFE SATISFACTION IN THE CONTEXT OF HEART DISEASE

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Introduction: Heart disease is associated with lower life satisfaction compared to that in the general population. In individuals with other chronic diseases, a higher level of social support and perceived health appear to be associated with greater life satisfaction. Other studies also suggest that social support may influence perceived health. However, the role of perceived health and social support in life satisfaction is still underexplored in the context of heart disease. The purpose of this study

is to examine the relationship between perceived health and life satisfaction in these patients. It also aims to investigate the mediating role of perceived health in the relationship between social support and life satisfaction. **Methods:** This cross-sectional study uses secondary data from a Canadian population-based survey of 6750 adults aged 30 years and older with heart disease. Life satisfaction was measured using an 11-point Likert scale question. A 5-point Likert scale question was used to assess perceived health. Social support was assessed in a subsample of 604 respondents using the short version of the Social Provisions Scale, which consists of 10 items rated on a 4-point Likert scale. **Results:** The sample was 54.5% male. Most of the participants (69.9%) were aged 65 years and older. Approximately 23% of the variance in life satisfaction was explained by perceived health ($F(1, 6089) = 1781.64, p < .001$). The results of the mediation analysis indicate that the relationship between social support and life satisfaction was significantly mediated by perceived health ($\beta = 0.099$; 95% bootstrap confidence interval: 0.063- 0.134). The direct ($\beta = 0.227, p < .001$) and total ($\beta = 0.326, p < .001$) effect of social support on life satisfaction were statistically significant. **Conclusions:** Briefly, these results suggest that social support and perceived health play a role in life satisfaction. These data support the notion that effort aimed at modifying social support and the perception of health may contribute to improve life satisfaction in patients with heart disease.

226) Abstract 1007

DEPRESSION AND NEUROTICISM IN PATIENTS WITH PERIPHERAL ARTERIAL DISEASE

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Background/objective: The aim of this study was to examine the relationship of depressive symptomatology and personality traits with peripheral arterial disease (PAD). **Method:** The sample comprised of 300 individuals ($M_{age}=65.3 \pm 8.7$ years, 61.0% female) recruited from the offices of 33 general practitioners. Based on at-rest ankle-brachial index (ABI) values and claudication symptoms, four subsamples were formed: clear PAD-positive, clear PAD-negative, ABI-negative but symptomatic, and a non-compressible-artery group. The concurrent role of depression (assessed by a shortened version of the BDI), and five-factor personality traits (measured with the Big Five Inventory) in predicting PAD status was examined using multinomial logistic regression analysis – controlled for sex, age, hypertension, diabetes, smoking, hazardous drinking, and body mass index. **Results:** Depressive symptomatology was significant in predicting peripheral arterial disease status even after controlling for both traditional risk factors and personality traits. Among the Big Five personality traits, neuroticism showed the most consistent relationship with PAD – independently of depression. **Conclusions:** Patients with PAD – even those with asymptomatic forms of the disease – are at higher risk for suffering from depression compared to individuals without PAD, independently of neuroticism, other Big Five personality dimensions or traditional risk factors for cardiovascular diseases.

227) Abstract 1643

RELATIONSHIPS AMONG BLOOD PRESSURE, PERCEPTION OF EMOTION, RISK TAKING, AND SOCIAL ANXIETY

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Mildly elevated resting blood pressure is associated with dampened emotional responses and increased risk-taking behavior, and these

variables may have important relations with social anxiety. The present study was designed to examine the relationships among blood pressure, perception of emotion in facial expressions, financial risk taking, and social anxiety. Fifty-three healthy, normotensive, volunteers ($n=41$ women, $n=12$ men) between ages of 18-46 without a history of cardiovascular or psychiatric disease participated. Systolic (SBP) and diastolic (DBP) blood pressures were determined over a 10 minute rest period using a calibrated Dinamap V100 monitor. Partially formed negative facial expressions at approximately 25% of full intensity were taken from photographs in the Cohn-Kanade AU-Coded Facial Expression Database, while risk taking was assessed using a paired-choice simulated lottery task. A subset ($n=34$) were given the Brief Fear of Negative Evaluation Scale to assess social anxiety. Independent groups t-tests indicated that women had lower SBP [$t(51)=4.794, p>.001$] and lower risk taking scores [$t(51)=2.545, p<.02$] than men. Correlation coefficients indicated that higher SBP was associated with increased risk taking [$r(51)=.328, p<.02$], while decreased accuracy of facial emotion perception was associated with increased social anxiety [$r(32)=-.355, p<.05$]. In women, higher DBP was associated with decreased emotion perception accuracy [$r(39)=-.317, p<.05$], while higher SBP was associated with higher social anxiety scores [$r(24)=.449, p<.025$]. In men, higher DBP was associated with increased risk-taking behavior [$r(10)=.717, p<.01$]. Multiple regressions further clarify these associations. Although these data are preliminary with limited sample sizes, several tentative conclusions may be drawn. For example, past findings of blood pressure-associated emotional dampening was extended to DBP in women. Moreover, observed associations between higher blood pressure and increased propensity for risk taking behavior independently replicates earlier findings. Finally, social anxiety appears to be associated with higher blood pressure and reduced accuracy in perception of emotional expression in faces, but additional research should assess more fully the mechanistic relationships among blood pressure control mechanisms, perception of emotion, and social anxiety.

228) Abstract 1317

PERSONALITY PREDICTS NIGHTTIME BLOOD PRESSURE IN MILLENNIALS WITH HIGH SOCIAL MEDIA USE

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Objective: Personality subtypes and nighttime blood pressure are both recognized predictors of cardiovascular disease. We assessed the role of personality type with the increasing demand of cyber technology, namely social media. It will be important to recognize its possible effects on cardiovascular health as probed by ambulatory blood pressure.

Methods: Healthy individuals ($N=88$, 77% Female, 31% African American) were surveyed using the media and technology usage and attitudes scale (MTUAS) to measure the volume of social media usage, the Myers Briggs personality assessment, demographics were measured, as well as 24-hour ambulatory blood pressure.

Results: Personality ($B = 5.37, t = 2.86, p = .005$) significantly predicted elevated overnight systolic blood pressure (SPB) in social media users, after controlling for negative and positive attitudes and overall media usage ($r^2 = .157, F(4, 72) = 3.37, p = .014$). Personality [introvert ($M=100, SD=2.1$), extrovert ($M=102, SD=1.7$), and blended ($M=111, SD=4.4$)] showed a significant gradient increase when compared to night time SPB; whereas positive and negative attitudes toward using technology were not significant predictors ($B = -3.245, t = -1.220, p = .227$). “All

technology usage” was not a predictor of overnight systolic blood pressure ($B=-4.909$, $t=-1.547$, $p=.126$) after controlling for personality and positive and negative attitudes.

Conclusion: The results indicate that extroverted, introverted, or blended personality types reported among high social media users, may contribute to the elevation of overnight systolic blood pressure with blended personalities types showing the greatest risk of cardiovascular disease.

229) Abstract 1628

WOMEN FROM VENEZUELA ARE MORE RESILIENT THAN MEN TO ACUTE STRESS WITH SPECIAL REFERENCE TO BLOOD GROUPS A AND O AND THE ERYTHROCYTE SEDIMENTATION RATE

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Background: Among the different approaches to deal with stress we have those based on the study of resilience, commonly understood as "the ability not only to diminish but also to learn from the effects of stress". Several authors have associated and differentiated the ABO blood system with psychiatric disorders such as depression, anxiety and stress. It has been found that people with Type O blood have a 25% less of von Willebrand factor (VWF) and high levels of FVIII have been associated to coronary artery disease this could explain the reason why the disease has a high prevalence in blood types A and AB. It has been suggested that individuals of blood group O, when they are type A personality (hostility), may increase the risk of myocardial infarction in relation to blood group A. Method: 70 college students 35 women and 35 men were included in the study, basal samples were taken to each one without stress condition (no academic test) and subsequently a sample with a multiplicity of stress conditions (academic tests). It was applied the Daily Stress Questionnaire -44, the Anxiety and Depression Scale Stress -21, the Reactivity to Stress Index 32 and the Connor and Davidson Reactivity to Stress Resilience Scale to each one in both conditions; simultaneously, blood samples were taken to process the various hematological analysis. The data were tabulated and compared statistically by the SPSS 15. Results: In both men and women, resilience decreases during acute psychological stress. In this scenario, women have better resilience compared to men, that is, women could more effectively address and overcome the effects of stress. Women of the blood group A appear to be more resilient than the blood group O. Among men there were no differences regarding the resilience of blood groups. The erythrocyte sedimentation rate is accelerated during acute psychological stress, but is not a good biomarker of it. Conclusion: Acute psychological stress exposes the subject to the boundary edge of thrombosis, so it is recommended to specialists to intervene in these stress conditions and evaluate the stress level through these questionnaires and these blood tests in order to prevent thrombotic complications in this targeted population.

230) Abstract 1262

COALESCENCE OF POSITIVE AND NEGATIVE FAMILY CONTEXT FACTORS: IMPACT ON ADULT STRESS PHYSIOLOGY

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Introduction: Early life stress (ELS) is associated with dysregulated stress response physiology. However, the direction and strength of this relationship differs across studies. The Biological Sensitivity to Context (BSC) theory offers a framework that may help integrate these mixed results. Specifically, BSC theory hypothesizes a quadratic relationship wherein both high and low ELS levels should result in

greater stress reactivity than moderate ELS. However, even studies using the BSC framework rarely examine the proposed quadratic relationship between stress exposure and reactivity. Further, the BSC identifies support – not just stress – as an important factor in the prediction of stress reactivity. However, previous investigations have rarely incorporated both concepts.

Methods: Using regression analyses, we examine whether the relationship between ELS and stress physiology is linear and/or quadratic in a sample of 213 community dwelling adults (58% male, median age= 25). Participants completed the Risky Family Questionnaire (RFQ) as an indicator of stress in the family context and a modified version of the Parental Bonding Instrument (PBI) as an indicator of support in the family context. Blood pressure reactivity was assessed during the Trier Social Stress Task (TSST) on two occasions, and we examine the average of these time points.

Results: Stress and support in the family context were negatively related as expected ($r=-.58$, $p<.01$). Unadjusted models revealed that only parental support – not stress – was associated with blood pressure reactivity, and this association remained after controlling for demographic and socioeconomic factors. Specifically, there was a positive quadratic relationship between PBI and SBP ($\beta=.14$, $p<.05$), consistent with BSC theory, and a significant linear relationship with DBP ($\beta=.14$, $p<.05$).

Conclusion: Consistent with the BSC, individuals reporting both high and low levels of parental support displayed greater SBP reactivity than those who reported moderate parental support. Although previous research in the BSC framework has focused primarily on stress in the early environment, the results of this study suggest that positive family factors may show more theoretically consistent associations with physiological reactivity, at least in adulthood.

231) Abstract 1646

ADVERSE CHILDHOOD EXPERIENCES AND VARIATIONS IN THE HPA-AXIS; EXPLORING EARLY LIFE FACTORS RELATED TO BLUNTED HPA-AXIS PRESENTATION LATER IN LIFE

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Stress can have short-term and long-term effects on the HPA-axis, a primary moderator of the stress response, and can manifest as *hyperactivity* or a *blunted* response. In both of these cases the HPA-axis has been shown to have effects beyond the expected point of reactivity, suggesting that certain types of stress can affect the physiological function of the HPA-axis. To consider these changes to physiology, the collection of hair samples has been suggested to measure cortisol over a 1-2 month period (Sauvé, et. al., 2007). Heim, et. al., (2008) utilized the Adverse Childhood Experiences (ACE) questionnaire, which explores 10 types of early life trauma and found a relationship between early life trauma and a blunted HPA-axis in adults. The present study sought to explore the types of trauma, and possible critical stages of development, that interact with this expression. **Method:** 117 participants were recruited and asked to provide a hair sample. In the first 28 participants, no exclusion for color-treated hair was present; these samples showed significantly lower cortisol levels ($F[1,110]= 9.447$, $p=.003$). Subsequently, the final analyses only examined samples from the remaining 89 participants. Participants were then given an ACE questionnaire evaluating both the quantity of ACEs reported and the age at which each was experienced. **Results:** Bivariate correlations were calculated between hair participants' hair cortisol and each of the 10 indices for early life trauma. The only type of trauma that had a significant relationship with blunted hair cortisol levels was sexual trauma ($r=-.311$, $p=.004$). When considering the age that sexual trauma occurred, a significant negative relationship was found between those who experienced sexual trauma at age 5-7 and hair cortisol levels ($r=-.246$, $p=.024$). **Discussion:** The ACE questionnaire was developed to assess neglect, abuse and family dysfunction. In the present study, sexual

trauma stood out as being associated with the blunted HPA-axis, with specific considerations for the ages 5-7. Given the diversity in how stress can manifest in the HPA-axis, specifically in populations who have experienced trauma, these findings hold implications for our understanding of stress physiology and highlight important methodological considerations for avoiding bias in future research.

232) Abstract 1515

BEHAVIORAL PATHWAYS FROM MALTREATMENT TO DISPARITY: HEALTH BEHAVIORS IN THE MIDUS SAMPLE

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Background: Childhood maltreatment (CM) is associated with higher incidence of physical and mental illness as well as early mortality. This study examines the relationship between CM and participation in various health behaviors in adulthood in order to identify possible opportunities for intervention that may improve health outcomes for this at-risk group.

Method: We conducted secondary data analysis using a nationally representative sample (MIDUS 2) dataset. Participants ($n=1,246$, 57% female, ages 24-84) reported on their exposure to maltreatment during childhood, including physical abuse, physical neglect, emotional abuse, emotional neglect, and sexual abuse. The Childhood Trauma Questionnaire (CTQ) was administered to measure CM. Participants also reported on several domains of health behaviors, including diet, exercise, sleep, and preventive health care utilization. We used multinomial logistic regression to estimate the association between maltreatment exposure and health behaviors in each domain.

Results: CM was prevalent in this sample; 49% of the sample reported clinically meaningful experiences of CM and over 28% reported multiple types of maltreatment. Maltreatment exposure was not associated with differences in engagement in preventive health care (e.g., vaccinations, common screenings) with the exception of lower reported multivitamin use, $b=.29$, $SE=.13$, $p=.028$, and a slightly higher likelihood of engaging in monthly breast self-exams, $b=-.29$, $SE=.15$, $p=.058$. Participants with a maltreatment history also reported lower likelihood of engaging in regular, vigorous exercise, $b=-.36$, $SE=.14$, $p=.009$, worse sleep quality, $b=1.42$, $SE=.21$, $p<.001$, less frequent consumption of fruits and vegetables, $b=1.99$, $SE=.86$, $p=.024$, less frequent consumption of lean meat, $b=-1.10$, $SE=.49$, $p=.025$, and more frequent intake of fast food or takeout, $X^2=10.67$, $p=.031$.

Discussion: Although CM was not associated with lower rates of engagement in most preventative health care measures, individuals with histories of CM do exhibit lower rates of exercise, poorer sleep, greater consumption of fast food, and lower intake of fruits, vegetables and lean meats. These findings may raise awareness of potential prevention targets for people with histories of CM with the aim of reducing health disparities for this at-risk group.

233) Abstract 1600

PRENATAL ADVERSITY PREDICTS HIPPOCAMPUS-DEPENDENT MEMORY

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Background: Children exposed early *postnatal* life adversity exhibit a dose dependent reduction in hippocampal volume (HV) (c.f. Lambert et al., 2017; Rao et al., 2010). In rodent models, early exposure to stress results in loss of HV, disruption of connectivity, and impaired memory performance (c.f. Molet et al., 2016). The role of *prenatal* adversity human hippocampal development and function is poorly understood.

To address this gap, we examined the relation between prenatal maternal psychological distress and hippocampus-dependent memory in early adolescence. **Methods:** 155 women were recruited during the first trimester of pregnancy into a prospective, longitudinal study of early life influences on development. A composite measure of prenatal psychological distress was computed by standardizing and averaging scores on the Center for Epidemiological Studies Depression Scale Short Form (CESD-SF), the Perceived Stress Scale (PSS), the State-Trait Anxiety Inventory (STAI), and a 10-item pregnancy anxiety scale (Rini et al., 1999). Hippocampal memory was assessed with The Mnemonic Similarity Task (MST) (Stark, Kirwan, & Stark, 2019) when the children were 11-12 years old. The MST provides measures of lure discrimination (the ability to identify similar lure items as “similar”) and recognition memory (recognizing repeated items as “old”). In the first phase of the MST, participants encoded pictures of objects by identifying if they were indoor or outdoor objects. For the next phase, participants were asked to identify objects as previously seen (targets), not previously seen (foils), or similar to images shown in the encoding phase (lures). **Results:** Higher levels of prenatal psychological distress predicted poorer performance on the lure discrimination trials ($r=-.20$; $p<.05$), but not on the recognition trials. These associations persisted after adjusting for relevant covariates including socioeconomic status, race/ethnicity, and gender. **Discussion:** To our knowledge, this study is the first to report an association between fetal exposure to maternal psychological distress and hippocampus-dependent memory in adolescent children. More broadly, these findings enrich the existing literature linking early-life adversity to hippocampal development and suggest that future investigations should continue to focus on the contributions of the prenatal period.

234) Abstract 1100

EXERCISE CAPACITY AND ANXIETY AMONG ADOLESCENTS WITH CONGENITAL HEART DISEASE

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Background:

Exercise capacity (VO_{2max}) is a predictor of cardiac-related hospitalizations and mortality among congenital heart disease (CHD) survivors. Physical activity engagement contributes to improved exercise capacity, but may be negatively affected by emotional distress such as anxiety. The current study aimed to determine 1) relationships between VO_{2max} , moderate-to-vigorous physical activity (MVPA), and anxiety (both cardiac-related and general anxiety) and 2) the role of disease severity and sex on study outcomes.

Methods:

Participants ($n=70$; $Mean=16\pm1.0$; 61% male; 85% Caucasian) performed an exercise stress test (VO_{2max}), wore an accelerometer around the waist for 4-7 days (MVPA), and completed questionnaires assessing cardiac-related (Cardiac Anxiety Questionnaire) and general anxiety (PROMIS-37, Emotional Distress - Anxiety). Disease severity was abstracted from medical records. First, Pearson correlations between study outcomes were conducted. Next, independent samples t-tests examined differences in study outcomes by disease severity and sex. Lastly, general linear models explored VO_{2max} as a predictor of cardiac-related and general anxiety while accounting for disease severity and sex.

Results:

Lower VO_{2max} was associated with greater cardiac-related ($r=-.42$, $p<.01$) and general anxiety ($r=-.29$, $p=.02$). MVPA was associated with VO_{2max} ($r=.44$, $p<.01$), but not anxiety. Individuals with complex disease ($t[69]=3.90$, $p<.01$) and females ($t[68]=2.46$, $p=.02$) had significantly lower VO_{2max} than those with moderate disease and males. Females reported more cardiac-related ($t[42]=-2.29$, $p=.03$) and general anxiety ($t[42]=-2.37$, $p=.02$) than males. VO_{2max} significantly contributed to the variance in cardiac-related anxiety above and beyond

disease severity and sex ($F[1, 63]=7.33, p=.01$), whereas sex, but not VO_{2max} , uniquely contributed to the variance in general anxiety ($F[1, 63]=4.70, p=.03$).

Conclusions:

CHD survivors with lower VO_{2max} may experience more cardiac-related anxiety, specifically. While results suggest this does not affect physical activity levels, teens with a lower exercise capacity are likely more distressed by cardiac symptoms. Given that as they age, CHD survivors are at risk for cardiac-related morbidities, additional research is needed to characterize anxiety and physical activity engagement among adult CHD survivors.

235) Abstract 1530

LIFE SATISFACTION BUFFERS THE EFFECTS OF INFLAMMATION ON COGNITIVE AGING

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Introduction:

The health benefits of life satisfaction have been studied in clinical settings. There is less research on the associations between life satisfaction and cognitive aging in healthy populations. Aging is typically accompanied by increased inflammation which is associated with cognitive decline. In this study, we investigated whether life satisfaction can buffer the detrimental effects of inflammation on cognitive aging.

Methods:

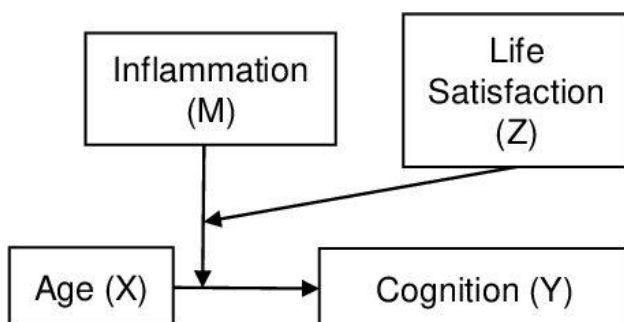
$N = 98$ healthy older adults (mean age: 74.1 ± 5.5 years, BMI = 25.5 ± 3.9 kg/m², 54% female) participated. Scores in the Mini-Mental-State Examination ranged between 26 and 30. Life satisfaction was assessed by means of the Temporal Satisfaction with Life Scale. The difference between the incongruent and congruent condition in a Stroop task was used as measure for cognitive performance. C-reactive protein (CRP) levels were used as markers for inflammation and were assessed by means of Dried Blood Spots. The model $Y = b_0 + b_1 X + b_2 M + b_3 W + b_4 XM + b_5 XW + b_6 MW + b_7 XMW + e$ (with $Y =$ age, $X =$ cognition, $M =$ inflammation, $Z =$ life satisfaction) that is visualized in the Figure was tested, using the SPSS macro PROCESS.

Results:

The overall model was verified ($R^2_{total} = .21, p_{total} = .003, b_0 = -143.3, b_1 = 2.0, b_2 = -113.7, b_3 = 1.5, b_4 = 36.8, b_5 = 31.2, b_7 = -0.4$, all $p_{bi} < .05$, b_6 not sign.). Older participants showed lower cognitive performance and higher inflammation. Furthermore, higher CRP levels were associated with lower cognitive performance. The interaction between age, inflammation, and life satisfaction reflects that increased CRP levels and lower cognitive performance were found only in older adults who reported low levels of life satisfaction.

Discussion:

We could confirm that higher levels of life satisfaction are associated with lower inflammation and better cognitive performance in older adults. Both are significant factors for an independent life style. Our study shows the importance of supporting psychological well-being not only in clinical settings, but rather in healthy populations. We conclude that life satisfaction is a key factor for healthy cognitive aging that should be included in prevention programs.



236) Abstract 1608

ADVERSE CHILDHOOD EXPERIENCES ARE RELATED TO PAIN CATASTROPHIZING IN ADULTHOOD INDIRECTLY THROUGH LONELINESS

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Studies show that a majority of adults in the United States report experiencing at least one adverse childhood experience (ACE), with around a quarter of the population reporting three or more. ACEs impact adult biological (e.g., HPA-axis) and psychosocial (e.g., loneliness) functioning, including cognitive patterns in stressful situations (e.g., pain). As one example, pain catastrophizing is an emotional and cognitive reaction to pain. It includes three subscales: Rumination, Magnification, and Helplessness, and is closely related to low distress tolerance. We hypothesized that women who had experienced greater ACEs would report higher levels of loneliness in adulthood and, in turn, would report greater levels of pain catastrophizing. 99 biologically female participants (88.9% white, 42.6 [12.5] years old) were recruited through Amazon's Mechanical Turk and completed an online survey including demographic questions, the 10-item Adverse Childhood Experiences Scale, the 13-item Pain Catastrophizing Scale, and the 20-item UCLA Loneliness Scale Version 3. A bootstrapped mediation analysis using 5,000 re-samples was conducted to examine the relationships between ACEs, loneliness, and pain catastrophizing. Results of the analysis indicated that loneliness had a significant indirect effect on the relationship between ACEs and pain catastrophizing (indirect effect = 0.63; 99% CI = 0.88 to 1.38), controlling for age and race, such that increased ACEs were related to greater loneliness, which in turn was related to greater pain catastrophizing. The present study adds to the literature by suggesting that loneliness (i.e., perceived lack of social support) is a possible mechanism by which ACEs can impact cognitive and emotional well-being in adulthood. Prior studies have found that ACEs can impact trust in adulthood, which might increase the likelihood that an individual will feel lonely. Further, per social cognitive theory, loneliness impacts social cognitions, which might make dealing with stressful situations (e.g. pain) more difficult and therefore might increase one's catastrophic thinking patterns. The current study has important implications for clinical research, as loneliness, or conversely perceived social support, might be an important intervention target for women with ACEs.

237) Abstract 1916

CAN YOU UNDERSTAND WHAT I'M FEELING? COGNITIVE EMPATHY AS CORRELATED WITH SLEEPINESS AND POOR SLEEP QUALITY

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Background: Understanding other's emotional state is important for social functionings as prosocial behavior, and caregiving efficacy. Sleep is crucial for emotional information processing. Yet, there are mixed findings regarding the relation of emotional processing and sleep quality. The purpose of this study was to examine the relationship between cognitive empathy (i.e. the understanding of the other's mental state) and sleep quality (SQ), as well as sleepiness in a non-clinical population. **Method:** 79 healthy adult students (age $M=32.9 \pm 8.3$, 45 males) volunteered to participated for no formal reward. Participants completed a computerized Reading the Mind in the Eye Test (RMET) - a standardized cognitive empathy test, based on recognition of specific expressions from eyes photos. Sleepiness was assessed by the Karolinska Sleepiness Scale and overall SQ by the Pittsburg sleep quality inventory. A clinical screening cut-point served to assign participants into fine ($n=60$) or poor ($n=19$) SQ groups. Groups did not differ in mean age, female/male ratio or sleepiness. **Results:** Sleepiness was strongly inversely correlated with the RMET empathy score (fig.1). ANCOVA revealed a mild effect for SQ, controlling for sleepiness, with a lower mean RMET score in the

poor SQ group ($F^{1,76}=4.28, p=.042, \eta^2_p=.053$). We further estimated success in recognizing threatening negative (e.g. hostile), non-threatening negative (e.g. regretful), neutral (e.g. decisive) and positive (e.g. thoughtful) RMET expressions. Hit rate was unexpectedly higher for positive expressions than for neutral, non-threatening and threatening expressions (fig.2). Correlations between sleepiness and expressions recognition were negative and close in magnitudes for all expression categories ($r=-.495$ to $-.630$, all $p<.01$). Repeated measures ANOVA revealed a main effect for SQ, mostly due to a lower (and low in general) hit rate for recognizing threatening expressions in the poor SQ group ($t^{77}=2.51, p=.014$, *Cohen's d*=0.662). **Conclusions:** Results suggest that sleepiness is strongly related to errors in identifying subtle clues in emotional expressions. Poor sleep quality may contribute to these errors, over and beyond sleepiness, and especially in processing threatening expressions. Further research is needed to examine whether this pattern is specific to the eyes or concerns subtle emotional clues in general.

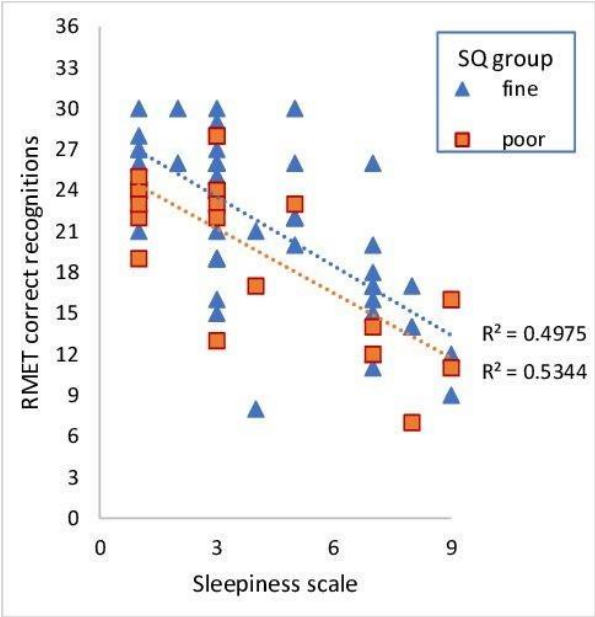


Figure 1: A scatter plot of RMET score and Sleepiness scale

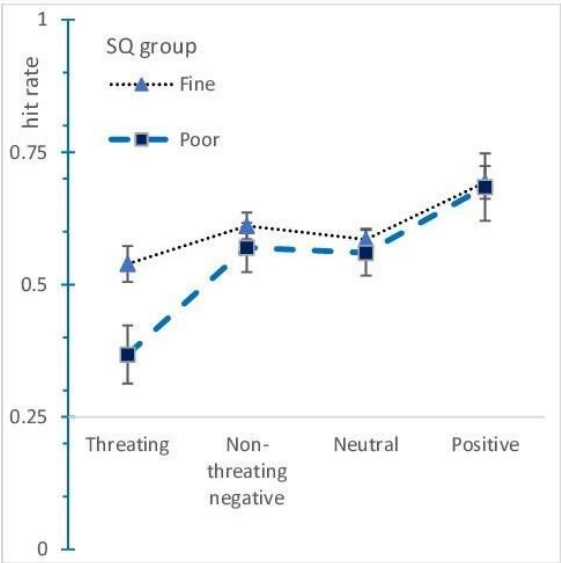


Figure 2: Hit rate by SQ group and emotional category (M ±SE)

238) Abstract 1301
AFFECT VARIABILITY AND HEALTH: MENTAL VERSUS PHYSICAL HEALTH OUTCOMES
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 Greater affect variability (i.e., higher fluctuations in affect over time) has been associated with poor mental health in a number of investigations. Objective physical health outcomes, however, are rarely studied. In the current investigation, we examined the impact of affect variability on both mental and physical health outcomes. We used the Midlife in the United States data to examine these associations (N=1,500). Affect was assessed during 8 days of daily diary reporting and mental and physical health status were obtained through self-report between 9 and 10 years later. Affect variability was calculated using standard deviation and mean squared successive difference. Simple and ordinal logistic regression and negative binomial models were used. Results indicated that higher negative affect (NA) variability tended to be associated with worse self-reported mental health (depressed affect: OR=1.19, $p=.10$; loss of interest: OR=1.36, $p=.02$; worrying: OR=1.24, $p=.055$; overall mental health: $b=0.27, p=.001$) and physical health ($b=0.32, p<.001$). Similarly, higher positive affect (PA) variability tended to be associated with worse self-reported mental health (depressed affect: OR=1.27, $p=.001$; loss of interest: OR=1.4, $p<.001$; worrying: OR=1.28, $p=.002$; overall mental health: $b=0.22, p<.001$) and physical health ($b=0.15, p=.007$). In contrast, only PA variability was associated with objective markers of physical health (chronic conditions: $b=0.07, p=.01$; headache frequency: $b=0.13, p=.03$), with the exception of high blood pressure (OR=1.09, $p=.16$). Although higher NA variability tended to be associated with worse health, NA variability interacted with mean NA levels such that individuals high in mean NA had better health when their NA variability was also high as compared to individuals high in mean NA with low variability (loss of interest: OR=0.69, $p=.003$; worrying: OR=0.89, $p=.078$; chronic conditions: $b=-0.09, p<.001$; high blood pressure: OR=0.83, $p=.03$, see Figure). Overall, results indicate that greater affect variability over time, regardless of valence, is associated with worse self-reported mental and physical health, but only greater PA variability is associated with objective physical health. Findings suggest additional investigations of mean levels of affect and affect variability in relation to health outcomes are warranted.

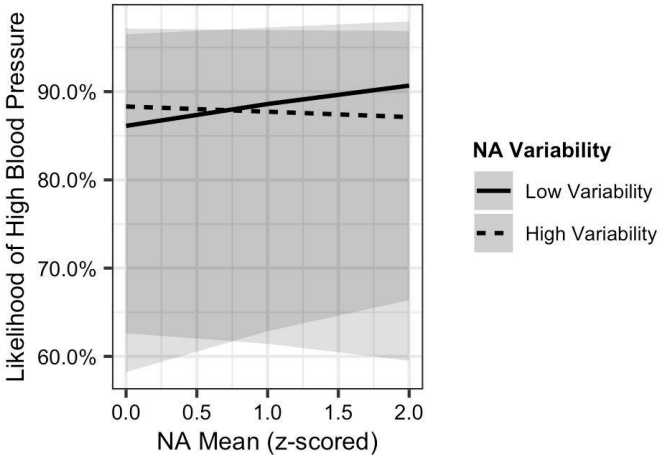


Figure 1. Negative affect variability and mean interaction on likelihood of having high blood pressure. Note: NA = negative affect.

239) Abstract 1073

LOW EXTRAVERSION IS ASSOCIATED WITH FEWER AND LESS ENJOYABLE DAILY UPLIFTS, AND CERTAIN HASSLES

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Low levels of extraversion have been linked to a number of negative health outcomes. One potential mechanism that may link extraversion to long-term health is differences in minor daily experiences, such as hassles (stressful events) and uplifts (positive events). Previous studies using retrospective reports have produced equivocal findings with regard to the relationship between extraversion and hassles (some suggesting that the association varies by type), whereas several studies suggest that extraversion is positively related to uplifts.

We examined associations between trait extraversion and frequencies of ambulatory assessment (AA) reports of stressful and uplifting events across 14 days, as well as aggregated ratings of how unpleasant or enjoyable events were. Participants (N=241) were racially/ethnically diverse community adults (63% Black, 24% Hispanic; ages 25-65; 65% women). As part of a larger study, participants completed baseline measures (e.g., extraversion) and provided AA of uplifting events, hassles, and hassle categorization (such as a conflict, health issue, other) 5x/day.

Lower extraversion was associated with less frequent uplifts and lower average enjoyment, but not with the frequency of total hassles nor average unpleasantness ratings. Participants lower in extraversion reported more frequent health hassles and higher unpleasantness for “other” hassles. Relationships with uplifts and “other” hassles were attenuated to non-significance when controlling for neuroticism, but were robust to the inclusion of additional controls (demographics factors, depressed mood). The unpleasantness of “other” hassles was robust to all controls.

The current research extends previous work on extraversion by obtaining reports of experiences in relatively real-time, thereby helping to reduce recall bias. These data suggest that persons with lower extraversion report less frequent and less enjoyable events, but reports of hassles vary by type. These results suggest that the role of uplifts merits further examination as a potential protective factor in associations between extraversion and health, whereas examining hassle type may help to explain inconsistencies in the literature. Additionally, stressors may have different effects on health outcomes depending on type, highlighting the need to tease apart the specific experiences that constitute these reports.

240) Abstract 1533

RESPONSE TO EMOTIONAL EXPERIENCE: A MULTIDIMENSIONAL SCALING STUDY IN DIVERSE ADULTS

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Personality dispositions emerge from the consistent ways that people respond to and cope with their emotions and are referred to as trait responses to emotion. Such dispositions include alexithymia, emotion expression, and urgency and have psychological and health consequences including increased smoking and drinking behaviors, elevated depression and anxiety symptoms, and adjustment. Although there are theoretical relationships among these trait responses to emotion, there are very little empirical data relating them to each other. The present study will establish these empirical relationships by developing a multidimensional model (MDS) from a diverse (age,

gender, ethnicity) sample of English-speaking participants (N = 250) from the online crowdsourcing service, TurkPrime. It is hypothesized that approach, escape/avoidance, and control will characterize the dimensional structure of trait responses to emotion. It is also hypothesized that demographic characteristics (age, gender, SEC, and early life experiences) will correlate with dimensions that emerge from the MDS. Participants will complete a web-based battery of surveys that will include demographics, early life experiences, and trait responses to emotion (Positive and Negative Urgency Measure, Need for Affect Scale, Acceptance and Action Questionnaire-II, Acceptance of Emotions Scale, Emotional Approach Coping Scale, Berkeley Expressivity Questionnaire, Emotional Expressiveness Questionnaire, Emotion Regulation Questionnaire, Affective Style Questionnaire, Toronto Alexithymia Scale-II). Data (collected November-December, 2019) will be analyzed using multidimensional scaling, zero-order correlations, and regression models. Mapping the relationships among trait responses to emotion can establish the nomological net among these dispositions, and their relationship to demographic characteristics can identify possible protective and risk factors for the development of these traits and their health consequences.

241) Abstract 1422

EMOTIONAL EXPRESSION AND THE EMOTIONAL AND PHYSIOLOGICAL RESPONSE TO ACUTE STRESS: THE FACE OF STRESS STUDY

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Background:

Emotional facial expressions are crucial for social interaction. While studies have shown the influence of a stressor on the perception of facial expression, very few studies have examined how stressors affect facial expression itself, in the individual who is under stress. It remains to be determined whether emotional expression during stress is conveying the emotional experience at that time, or whether expression has an emotion regulatory function.

Objective:

To examine the relationship of emotional expression during stress with the emotional and physiological stress response.

Methods:

54 undergraduate students (85% women) participated in a social evaluative math task, while ECG and webcam videos were recorded. FaceReader software was used to analyze facial expression. The Discrete Emotions Questionnaire was administered after rest, stress and recovery.

Results:

Experiencing anger during rest was associated with increased expressed anger during stress ($r=.61$), while experienced resting happiness ($r=-.34$) and relaxation ($r=-.35$) were associated with decreased anger expression during stress, correcting for resting anger expression. Anger expression during stress was associated with increased relaxation ($r=.30$) and decreased anger ($r=-.36$) reactivity. Happiness expression during stress related to reduced emotional stress reactivity (sadness: $r=-.38$, anger: $r=-.25$), as well as with lower levels of experienced anger ($r=-.41$), disgust ($r=-.44$), fear ($r=-.36$), and sadness ($r=-.41$) during the subsequent recovery period. Both increased happiness and anger expression were associated with reduced heart rate reactivity ($r=-.23$ and $-.19$ respectively).

Conclusion:

These preliminary results suggest that experienced negative emotion during rest predicts increased anger expression during stress. Both anger and happiness expression during stress may have an emotion regulatory function.

242) Abstract 1656

IS IT BETTER TO HAVE LOVED?: EXAMINING THE ASSOCIATION BETWEEN RELATIONSHIP TYPE AND HEALTH

Alissa B. Vandenberg, Master of Arts in Psychological Research, Psychology, California State University, Long Beach, San Clemente, CA, James H. Amirkhan, Doctor of Philosophy in Psychology, Psychology, California State University, Long Beach, Long Beach, CA Research indicates that romantic relationships, such as marriage, may buffer against ill-health. However, the mechanism producing this benefit has yet to be determined. It is proposed here that differential stress overload, the type of stress specific to dysfunction, may be this mechanism. To date, no study has evaluated stress overload in the context of intimate relationships; moreover, previous studies have not examined the full range of relationship types, often comparing Single to Married persons. The current study addressed these problems, assessing levels of stress overload across Single, In a Relationship, Cohabiting, and Married persons. It was hypothesized that (1) stress overload would differ across relationship status, with the Married group showing significantly lower levels than all other groups, and (2) the association between relationship type and stress overload would be moderated by levels of perceived social support and relationship quality. A sample of 238 participants ($M = 31.63$ years; 69.9% female, 19.2% male) were recruited from a public university, the surrounding community, and various social media platforms (Facebook, Craigslist, Reddit) to participate in an online survey about romantic relationships and stress. Respondents indicated their relationship status (Single, In a Relationship, Cohabiting, Married), and completed the Stress Overload Scale-Short (SOS-S), Multidimensional Scale of Perceived Social Support (MSPSS), and—if in a relationship—abbreviated version of the Perceived Relationship Quality Component Scale (PRQC). In regard to the first hypothesis, a one-way ANOVA indicated that SOS-S scores did not vary significantly across relationship status groups, $F(3, 234) = .37, p = .77$. In regard to the second hypothesis, moderation analyses using PROCESS macro v3.4 indicated that neither social support, $F(1, 213) = .50, p = .49$, nor relationship quality, $F(1, 165) = .30, p = .59$, affected the association between relationship type and stress overload. Although results were not as predicted, these data provide insight into the benefits romantic relationships, indicating that differential stress is not likely the cause of health disparities. Limitations of this study, such as uneven gender representation, and directions for future research, such as considering socioeconomic status or source of social support, are discussed.

243) Abstract 1532

BUILDING AN ALLOSTATIC LOAD SCALE USING ITEM RESPONSE THEORY

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Objective: Allostatic load is a latent construct representing poor health and dysregulation across multiple physiological systems. It is commonly calculated as a sum-score, by summing the number of biomarkers that fall into a high-risk category. Due to mathematical properties of the sum-score, the greater the number of biomarkers measured, the more stable the score. However, measuring a large set of biomarkers is often infeasible, because of increased study costs and participant burden. Moreover, the sum-score approach implies that all biomarkers are equally informative for constructing the allostatic load index. Our goals were to 1) evaluate whether this is true and 2) identify an abbreviated set of biomarkers that are most informative. We demonstrate the feasibility of applying item response theory (IRT), a modern measurement tool, to answer these questions.

Methods: We analyzed data from the 2015-2016 National Health Examination and Nutrition Survey, using twelve biomarkers that together measure the inflammatory, cardiovascular, lipid and glucose physiological systems. Each biomarker was dichotomized – high risk was defined as biomarker concentrations belonging to the highest or lowest survey-weighted quartile depending on the measure. We analyzed those aged 20-59 and excluded those with a positive urine pregnancy test. The sample size was $n = 3751$. Using a 2 parameter logistic IRT model, we evaluated each biomarker's ability to discriminate across different levels of the allostatic load construct (e.g. some biomarkers may be more informative for people with poor health). We estimated IRT scores (expected a priori scores), which can account for both the response patterns (e.g. which specific biomarkers a participant is high-risk for) and weight the biomarkers based on how much information they provide about the latent allostatic load construct. We compared IRT scores to sum-scores.

Results: Body-mass-index and C-reactive protein provided the most discrimination, while creatinine provided the least. Although there was a general monotonic relationship between the sum-score and the IRT score, differences remained because the IRT score also depended on the biomarker characteristics (e.g. discrimination) and response pattern.

Conclusion: IRT is a useful tool to create an abbreviated, clinically informative set of allostatic load measures.

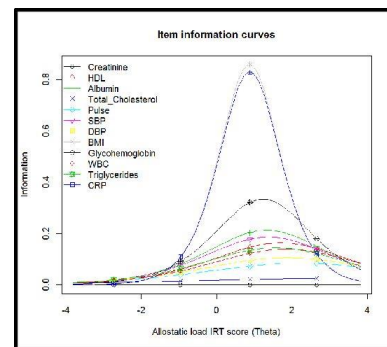


Figure 1: Item information curves for twelve allostatic load biomarkers in the NHANES sample. BMI and C-reactive protein provide the most information, and is most informative for slightly higher than average allostatic load IRT score (which can be interpreted as a z-score with mean 0 and standard deviation 1). Meanwhile creatinine provides the least information.

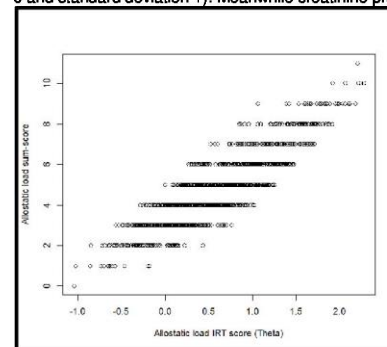


Figure 2: Plot of the allostatic load sum-scores versus the estimated allostatic load IRT scores using twelve biomarkers for the NHANES sample. There is a general monotonic relationship but differences remain because the IRT score also accounts for biomarker characteristics (e.g. discrimination) and response pattern.

244) Abstract 1133

INVESTIGATING THE EFFECT OF INTERNALIZATION OF BODY IMAGE AND EXERCISE TYPE ON INTUITIVE EATING: AN EXPANSION OF THE ACCEPTANCE MODEL OF INTUITIVE EATING

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Intuitive eating (IE) may contribute to body positivity (i.e., a multidimensional construct involving acceptance and respect of one's body and/or body image) as well as eating behaviors that reflect body positivity. IE is an adaptive eating style in which individuals rely on their physiological hunger and satiety cues to tell them when to start and stop eating and encourages focusing on nutrient-rich food. The Acceptance Model of IE proposes that various factors contribute to IE (e.g., exercise motivations). However, internalization of body image ideals and exercise type have not been examined in relation to IE, despite evidence that these two factors may influence body dissatisfaction. Thus, the present research expands the previous model by examining exercise types and internalization of body image in relation to IE. Participants were 484 college students from a Midwestern liberal arts college and a Southern state university. IE was assessed with the Intuitive Eating Scale; IES. Internalization was assessed using the Sociocultural Attitudes towards Appearance Questionnaire-3 (SATAQ-3). Exercise motivation was assessed using the Function of Exercise Scale, while exercise type was assessed using the following item: "What type of exercise do you participate in most often?" Body positivity measures were the Body Acceptance by Others and Body Appreciation scales. A series of linear regression analyses showed that all factors within the expanded model predicted IE. Specifically, body acceptance by others, $b = .15$, $t(6, 437) = 3.44$, $p < .05$, functional exercise motivations, $b = .11$, $t(6, 437) = 2.45$, $p < .05$, type of exercise, $b = .26$, $t(12) = 2.85$, $p < .05$, and body appreciation, $b = .22$, $t(6, 437) = 4.1$, $p < .05$, all positively predicted IE, whereas internalization of body image, $b = -.17$, $t(6, 437) = -3.56$, $p < .05$, and appearance-based exercise motives, $b = -.22$, $t(6, 437) = -4.74$, $p < .05$, negatively predicted IE. These results suggest that internalization of body image ideals and exercise type were cross-sectionally related to IE behavior and should be included in future models of IE. Prospective studies disentangling the timing of associations are needed to determine if and when intervening on internalization and exercise type may promote healthy eating and exercise behavior and combat body dissatisfaction, eating disorders, and/or obesity.

245) Abstract 1273

VALIDATION OF A SCORING SCHEME FOR THE MOTIVATIONAL COMMUNICATION COMPETENCY ASSESSMENT TEST (MC-CAT) WITH INTERNATIONAL BEHAVIOR CHANGE EXPERTS

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Background: The importance of physician training in motivational communication (MC) for support lasting health behavioural changes in patients suffering from chronic diseases is an emergent research topic. However, existing MC evaluation tools are complex, invasive, time consuming, and impractical for use within the medical context.

Objective: As part of a larger study to develop and validate a new MC assessment tool (the MC Competency Assessment Test, MC-CAT), this study sought to validate the scoring algorithm and the classification scheme of the tool with an international panel of behavior change experts.

Methods: Fourteen international experts were presented with dialogue exchanges between a physician and 3 separate 'patients', where physicians had the opportunity to demonstrate one of 11 core MC competencies by selecting one of five possible responses (to a patient statement reflecting resistance to change a health behavior). Experts were asked to rank order the five physician statements from "best" (most consistent with MC) to "worst" (least consistent with MC). Percent agreement between our classification scheme and expert ratings was assessed.

Results: The percentage of agreement of rank order of responses across all 3 base cases was divided in three categories: excellent (100% agreement), acceptable (+/- 1 deviation in rank from our item order = criterion) and poor (+/- 2 deviation in rank from our item order). We observed excellent agreement in rank order of responses across all 3 cases among 60.9±14.0% (range 37.1 to 84.3%) of respondents and acceptable-excellent agreement (criterion) among 90.6±7.4% (range 74.2 to 98.6%) of respondents.

Conclusion: These results demonstrate very good agreement with our response classification across all 11 competencies. The next step is to expand the case bank where "new" cases would retain the same base structure as the initial 3 cases – only patient, disease, behavioral target, and contextual variables will be modified in multiple permutations and being integrated in the MC-Competency Assessment Test (MC-CAT) platform.

246) Abstract 1641

CIRCADIAN REST-ACTIVITY RHYTHM DISTURBANCES AND INFLAMMATION IN OLDER BEREAVED INDIVIDUALS

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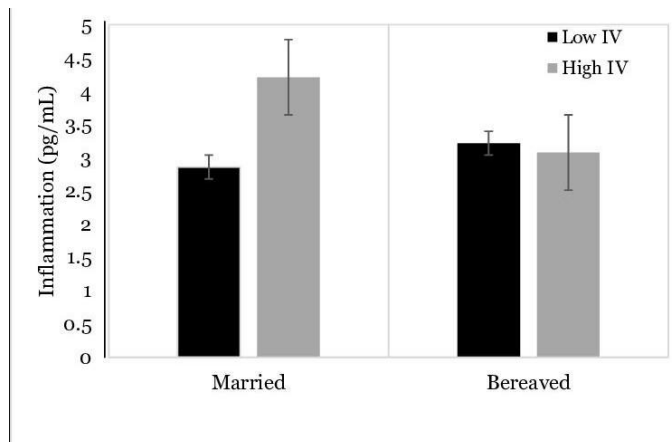
Objective: Spousal bereavement is associated with inflammatory conditions including depression, cardiovascular disease, stroke, and premature mortality. It also has a significant impact on biobehavioral factors that affect inflammation including sleep disruption, physical exercise, and dietary intake. These behaviors are regulated along the 24-hour period by the circadian timing system. In this study, we examined the association between the rest-activity rhythm (which reflects the function of the circadian timing system) and inflammation after adjusting for body mass index, and whether this association varies by marital status (bereaved individuals versus married controls).

Methods: Participants included 34 recently bereaved individuals and 34 married controls with a M (SD) age of 73.12 (7.32) years. Inflammation was measured using interleukin-6 (IL-6). Circadian rest-activity rhythm (or RAR) parameters of regularity, timing, and shape were derived via objective actigraphic recordings. The association between various RAR parameters and IL-6 were tested in separate multiple regression models while controlling for age, sex, body mass index, comorbid medical conditions, and depression symptoms.

Results: RAR parameters were not significantly associated with IL-6. However, there was a significant moderating effect of marital status on the association between intra-daily variability of the RAR and inflammation ($B = -.5129$, standardized $\beta = -1.082$, 95% confidence interval [CI] = -9.715 to -0.543 , $p = 0.029$). Simple slopes analyses showed that higher intra-daily variability (reflecting more frequent shifts between rest and activity) was associated with greater inflammation, but only among married controls ($B = 2.915$, $\beta = 0.313$, 95% CI = -0.389 to 6.219 , $p = .082$) and not bereaved individuals ($B = -0.289$, $\beta = -0.032$, 95% CI = -3.554 to 2.976 , $p = .858$).

Conclusions: Greater fragmentation of the circadian RAR was associated with inflammation, but among married individuals only. It is possible that rhythm disturbances in married individuals are chronic (as opposed to acute disturbances among the bereaved) and this long-term pattern of irregularity increases production of proinflammatory

cytokines. Future studies should examine the psychosocial qualities and biological implications of having high intra-daily variability in older married individuals.



247) Abstract 1209

PRIMARY SYMPTOM PRESENTATIONS OF PATIENTS IN ASTHMA SPECIALIST CARE - THE IMPORTANCE OF NONSPECIFIC SYMPTOMS

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Asthma patients who are seeking treatment at a pulmonary clinic are most likely motivated by a change in their experience of symptoms. However, their primary complaints may not always be related to typical asthma symptoms. Treatment recommendations for patients may therefore overlook important aspects of their condition. Whereas primary symptoms volunteered by patients could be expected to depend on the status of their airways, they may also depend on other factors such as the perception of their asthma or their mood state. We therefore examined symptomatology of asthma patients visiting specialist care clinics. They were presented with a 25-item Asthma Symptom Checklist (ASC) that explored the complaints (mood and bodily sensations) they currently experienced. A total of 409 asthma patients completed the list, together with measures of asthma control self-report, depression, and anxiety disorders. Information on demographics, asthma severity, and lung function was obtained from physicians' documentation. Findings showed that asthma patients' primary symptoms were not necessarily airway-related traditional symptoms. Most frequently, patients endorsed feeling "tired", "exhausted", and "sleepy", and then obstruction symptoms "chest tightness" and "wheezing". A Principal Component Analysis of the symptom list yielded a five-factor structure resembling the symptom profile identified for the original ASC, with irritability, fatigue/CNS symptoms, chest obstruction, anxiety, and hyperventilation. Subscales formed from these factors showed good internal consistencies ($\alpha=.75-.89$). Hierarchical multiple regression analyses were then calculated to study predictors of subscale scores. A 4-step model indicated that the addition of anxiety and depression diagnoses significantly increased explained variance for all five subscales ($p<.001$) after controlling for demographics and BMI, asthma severity/control and lung function measures (steps 1-3, respectively). Our findings suggest that symptoms nonspecific to asthma can play a substantial role in the clinical presentation of patients seeking treatment in specialist care clinics.

Exclusive focus on prototypical asthma symptoms may miss important information related to patients' well-being, and surveying both prototypic and nonspecific symptoms of these patients is warranted for an integrated medicine management of asthma.

248) Abstract 1212

EMOTIONAL EATING AND DEPRESSIVE SYMPTOMS AMONG ASIAN COLLEGE STUDENTS: THE MEDIATING ROLE OF ACCULTURATIVE STRESS

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As the Asian population continues to grow in the United States, studying their cultural adjustment-related stress, acculturative stress, becomes increasingly important. Specifically, the aim is to investigate the role acculturative stress plays in the relation between emotional eating and psychological well-being. Emotional eating is the phenomenon of negative emotions inducing overeating, usually of unhealthy food. A large number of studies suggest that emotional eating is linked to adverse psychological well-being, such as depressive symptoms. However, few studies have examined specific stressors that relate to the behavior of emotional eating. The goal of the present study was to examine the association between acculturative stress, emotional eating, and psychological well-being among Asian college students. A total of 483 Asian or mix-race Asian students (21% male, 78% female, and 1% other; $M_{age} = 20.33$) from the University of California, Irvine participated in an online survey study. We found that acculturative stress was a significant predictor variable of depressive symptoms, $B = .12$, $SE = .03$, $p < .0001$. However, surprisingly, and inconsistent with the results of previous studies, the current study suggests that more emotional eating was linked with less acculturative stress, $B = -.79$, $SE = .30$, $p = .0090$. The indirect effect was tested, and results indicated that the indirect coefficient of emotional eating on depressive symptoms was significant, $B = -.09$, $SE = .04$, 95% CI = $-.1878, -.0205$. This mediation model was driven by the intercultural relation subscale of acculturative stress, which independently mediated the relation between emotional eating and depressive symptoms, $B = -.10$, $SE = .04$, 95% CI = $-.1984, -.0282$. This study highlights that emotional eating is inversely related to acculturative stress and depressive symptoms among Asians. Perhaps, emotional eating represents a method of coping, albeit that it has negative health consequences. The findings of the study underline the need to study this further. Counseling and prevention centers should take acculturative stress into account in treating emotional eating and depressive symptoms among minorities.

249) Abstract 1828

MIND, SPIRIT & HEART: AN EXPLORATION OF ASSOCIATIONS AMONG MINDFULNESS, SPIRITUALITY AND HEART RATE VARIABILITY IN AFRICAN AMERICANS

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Increasing evidence suggests that mindfulness may be an important buffer against the negative mental health consequences of racial discrimination among African Americans (AA). However, fewer studies have examined mindfulness in relation to indices of physical health among AAs, a problem further compounded by confluences of trait mindfulness with concepts such as spirituality. In the present study, we explored the interrelationships among trait mindfulness, assessed using the Cognitive and Affective Mindfulness Scale – Revised (CAMS-R), self-assessed spirituality, and resting-state

vagally mediated heart rate variability (HRV), a transdiagnostic index of psychopathology and cardiovascular disease (CVD) risk. In a process-oriented regression model, we examined the potential moderating role of spirituality on the association between trait-mindfulness and HRV. Controlling for age and sex, trait mindfulness marginally predicted resting HRV ($b = .41, SE = .02, p = .075$); however, the trait mindfulness X spirituality interaction was significant ($b = -.02, SE = .01, p = .015$). Intriguingly, mindfulness was inversely associated with HRV at higher levels of self-reported spirituality ($b = -.03, SE = .04, p = .004$). As these unexpected findings suggest, disentangling the potential mental and physical health benefits of mindfulness among AAs may require a greater degree of nuance in future research.

250) Abstract 1481

RACE DIFFERENCES IN THE ASSOCIATION BETWEEN OBESITY AND C-REACTIVE PROTEIN AMONG EX-SMOKERS

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Background: Although African Americans smoke at similar or lower rates than non-Hispanic whites, their rates of lung cancer incidence are significantly higher. Smoking cessation reduces C-reactive protein (CRP), a biomarker for inflammation and mediating pathway between cigarette use and cancer incidence; yet, CRP fails to return to levels of never smokers. African Americans have higher levels of CRP than whites and experience disproportionate rates of both post-cessation weight gain and obesity, which is associated with greater lung cancer risk. The disproportionate weight gain may compound inflammation-related disease risk after smoking cessation, underlying racial/ethnic disparities. We aimed to examine race differences in the effect of obesity on inflammation among ex-smokers.

Methods: We used data from the Health and Retirement Study, a longitudinal panel study of middle-aged and older adults. Participants completed an in-person interview at baseline and were followed up every two years. Demographic and smoking history were self-reported, and biomarker and anthropometric data were measured at 2006, 2010, and 2014. African Americans and non-Hispanic whites who were abstinent for at least one year, cancer-free, and had complete information on CRP and smoking history were used for analyses ($N=3448$). Multivariate regression analyses using change scores were conducted to examine the main and interaction effects of race and change in waist circumference (WC) or weight on CRP over eight years. CRP was log-transformed to address non-normality.

Results: African Americans had significantly higher levels of CRP and weighed more than whites at baseline. Controlling for sex, education level, and baseline body mass index, WC, and CRP, the main effects of WC change ($p<.01$) and weight change ($p<.0001$) over eight years predicted CRP decline; the effect of race was not significant ($p>.05$). The interaction effects of race and WC change and weight change were not significant ($ps>.05$).

Conclusions: Race differences in the effect of obesity on CRP over time were not observed among ex-smokers. Our results contribute to understanding the complex etiology of racial/ethnic disparities in lung cancer. Finding no race differences in bio-behavioral mechanisms among ex-smokers underscore the importance of examining social and environmental factors that may cause disparities.

251) Abstract 1172

EXAMINING SPATIOTEMPORAL ASSOCIATIONS BETWEEN LEGAL DRUG OUTLETS AND CRIME AND VIOLENCE

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Science, Jason Douglas, Ph.D., Crean College of Health and Behavioral Sciences, Chapman University, Orange, CA

Legal drug properties, such as tobacco shops, are neighborhood-level institutions that (1) are prevalent in low-income communities of color, and (2) frequently associate with compromised community health and wellbeing. For example, research has identified increased tobacco product use among people living near tobacco shops. More recently, our research was the first to identify crime and violence increases proximal to tobacco shops in South Los Angeles (SLA), CA. Thus, our research identified a new public health threat associated with crime and violence in a large low-income community of color. Yet, these initial findings only begin to address a major gap in our understanding of health compromising crime and violence associated with legal drug properties. Thus, the current paper seeks to examine temporal geographic crime and violence associations with tobacco shops, off-sale alcohol outlets, and medical and recreational marijuana dispensaries (a new legal drug outlet in California as of January 2018) in SLA. We accordingly conducted spatial buffer analyses to examine change in property and violent crime within 100-foot buffers of each property using 2015 and 2018 crime data. Following, we conducted spatial regression analyses to investigate the relationship between legal drug outlet density and property and violent crime at the census tract unit of analysis for both project years. Results indicated that property crime decreased significantly from 2015 to 2018 around medical and recreational marijuana dispensaries. Spatial regression analyses revealed that tobacco shops, but not off-sale alcohol and medical/recreational marijuana dispensaries, associate with property and violent crime escalations in SLA. Thus, our study findings indicate that medical and recreational marijuana dispensaries may have improved security and social controls that deter crime and violence. Furthermore, our research verified that tobacco shops continue to pose a public health threat that associates with crime and violence. Therefore, we contend that (a) additional research is needed to identify the mechanisms that connect tobacco shops to property and violence crime, and (b) additional policies regulating tobacco shops will be necessary to improve health and safety.

252) Abstract 1591

RELATIONSHIPS BETWEEN REGIONAL AIR POLLUTION AND DEPRESSIVE SYMPTOMS AMONG YOUNG ADULTS IN NORTHRIDGE, CALIFORNIA

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Prior research has shown that populations in highly congested cities are exposed to higher levels of air pollutants such as particulate matter less than 2.5 microns ($PM_{2.5}$). In the U.S., ethnic minority groups are more likely to live in highly polluted areas and are exposed to these burdens on a daily basis. Additionally, these high $PM_{2.5}$ have been linked to mental health disorders. This study seeks to examine if exposure to higher concentration of $PM_{2.5}$ is associated with increased depressive symptoms among California State University, Northridge students, ages 18 to 25 years with a family history of type 2 diabetes.

Methods: The "Metabolism and Stress Assessment (MeSA)" lab is currently assessing the metabolic risk in young adults and has currently enrolled a sample size of 24 participants with a final goal of 100 participants. Of those participants, 66.7% reported female and 56.5% reported Hispanic or Latino/a with a mean age 21.4 years old ($SD=1.8$). As part of the MeSA study, geographic area of residence of each participant is determined based on the participant's residential address provided during the start of the first visit via a one-time geographic survey. After determining the region of Los Angeles in which they reside, we examined the concentration of $PM_{2.5}$ based on the California Office of Environmental Health Hazard Assessment's CalEnviroScreen 3.0. We examined the sum of depressive symptoms using the Center for Epidemiologic Studies Depression Scale (CES-D), also collected via a one-time survey. For our preliminary analysis,

a Pearson correlation coefficient (r) value was utilized to assess the relationship between PM_{2.5} and depression.

Results: Preliminary results show there was no significant relationship found between PM_{2.5} and depressive symptoms, ($r=-0.14$, $p=0.45$).

Conclusion: Our study is still ongoing and future analyses will aid in our understanding of possible relationship between PM_{2.5} and depression. The end goal of our study is to identify depression risk in susceptible populations exposed to higher PM_{2.5}; this greater understanding of the issue may influence future health policies regarding environmental pollutants.

253) Abstract 1066

PAIN RESILIENCE AND PAIN CATASTROPHIZING PREDICT PERFORMANCE ON A SHORT-TERM MEMORY TASK DURING SIMULTANEOUS ISCHEMIC PAIN

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Among pain researchers there is a growing interest in the relationship between psychological resilience and pain experience. Whereas much of this work has focused on individual differences in pain perception or sensitivity, an equally important dimension of resilience is the capacity to persist with goal-directed activity despite experiencing pain. Consistent with this latter focus, the current study examined how pain resilience and pain catastrophizing combine to moderate the effects of ischemic pain on short-term memory task performance. Using a within-subjects design, 121 healthy undergraduates completed four trials of a block-tapping task with concomitant pain during the second and fourth trials. Analyses using multilevel modeling with time nested under participants was fitted for the two pain exposure trials. Examination of the level 1 predictors revealed significant effects for task performance ($\beta = 4.293$, $p < 0.001$) and pain intensity ($\beta = 0.332$, $p < 0.05$), reflecting an overall increase in task performance and pain ratings from the first to second pain trial. Subsequent analysis of the task performance with level 2 moderators (i.e., Pain Resilience Scale, Pain Catastrophizing Scale) revealed a significant time \times resilience \times catastrophizing interaction ($\beta = -4.37$, $p < 0.05$). In summary, a combination of high pain resilience and low pain catastrophizing relative to those with low pain resilience and high pain catastrophizing was associated with better task performance over time. These findings confirm existing evidence that resilience moderates performance during pain, and offer new evidence that resilience and catastrophizing interact to shape this effect.

254) Abstract 1082

USE OF METAPHORS AND SIMILES TO DESCRIBE PAIN RELATES TO BETTER SOCIAL SUPPORT

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Pain is a universal experience, yet researchers and clinicians continue to struggle with understanding it, as it is a subjective experience. Analogous language (metaphor/simile) is often used to describe pain but has not received much research attention. Linguistic work suggests that analogous language is used to help convey an abstract concept to someone else in a relatable form. This study asked 204 individuals to describe, in detail, their most intense pain ever. Use of analogous language and social support were coded in the responses. On average participants naturally used one metaphor or simile ($M=.94$). There was a positive relationship where greater use of metaphors and similes to describe pain was associated with a more social support from friends and family ($r=.24$). The findings in this study indicate that, by using metaphors and similes, participants may have better related their pain to a family member or friend. In turn, by understanding the pain, the family member or friend was better able to provide support. Although

future research must explore the causal relationships, this study provides a potential pathway for individuals in pain to receive better social support.

255) Abstract 1521

PREDICTORS OF RESPONSE TO INTEROCEPTIVE EXPOSURE-BASED COGNITIVE-BEHAVIORAL THERAPY (CBT-IE) IN IRRITABLE BOWEL SYNDROME PATIENTS IN JAPAN

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Background: Irritable bowel syndrome (IBS) is a psychosomatic disease characterized by abdominal pain and bowel movement problems such as diarrhea and constipation. The current study examined the efficacy of interoceptive exposure-based cognitive-behavioral therapy (CBT-IE), which targets visceral sensations for the treatment of IBS (Craske et al., 2011). We developed the Japanese version of CBT-IE and conducted intervention studies, including single-arm open-label clinical trials by using CBT-IE with or without psychoeducational videos for IBS (Oe et al., in submission., Funaba et al., 2019). In these studies, we found that CBT-IE with and without psychoeducational videos were useful for alleviating IBS symptoms after the intervention. However, we observed individual differences in efficacy. In this study, we aimed to identify predictors of response to enhance the effectiveness of CBT-IE in IBS patients.

Methods: We analyzed sample that combines our two open trials of CBT-IE consisting of 13 males and 16 females (mean age=39.1 \pm 14.1) diagnosed with Rome III IBS. Hierarchical multiple regression analysis was performed with duration of IBS (years), type of IBS (diarrhea type or not) and intervention methods (with or without videos) as explanatory variables, and scores of the Japanese version of the IBS Severity Index (IBS-SI-J: mild (75-174), moderate (175-299), or severe (300-500)) as an objective variable. Thus a model with three variables and their interactions was examined to identify predictors of IBS severity after CBT-IE.

Results: Duration of IBS ($\beta=.75$, $P<.05$) and the interactions of intervention methods (with or without videos, $\beta=.44$, $P<.05$) were related to the IBS severity at the three-month follow-up (3MFU). At the six-month follow-up (6MFU), the more extensive intervention, CBT-IE with psychoeducational videos, was positively associated with improvement in IBS severity ($\beta= -.51$, $P<.01$). The interaction effect of intervention methods (with or without videos) and duration of IBS were still significant at 6MFU ($\beta=.51$, $P<.01$).

Conclusions: Our results indicated that IBS duration and intervention methods were related to IBS severity after CBT-IE. Shorter duration of IBS and to use CBT-IE with psychoeducational videos predicted better response to CBT-IE.

256) Abstract 1536

EXPOSURE TO ENVIRONMENTAL MICROAGGRESSIONS ARE ASSOCIATED WITH INCREASED CRP AMONG YOUNG GAY AND BISEXUAL MEN

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Sexual minorities are at greater risk for CVD than heterosexuals which may be due to the disproportionate stress from discrimination

experienced among these young men. One form of discrimination that is important to understanding CVD risk among sexual minority men is microaggressions which are the daily verbal/nonverbal slights or insults (intentional or unintentional) that convey hostile or negative messages to individuals within a marginalized group. We hypothesized that exposure to microaggressions triggers a stress responses which then leads to heightened levels of inflammatory biomarkers in the blood, such as C-reactive protein (CRP). Fifty-seven participants were recruited from a larger cohort study of young gay and bisexual men (YGBM) -the P18 Cohort Study. The validated Sexual Orientation Microaggressions (SOM) scale was used to assess interpersonal (i.e. micro assaults, microinsults, and microinvalidations experienced during interactions with others) and environmental (i.e. microaggressions related to constantly being presented with heteronormative queues that perpetuate stereotypes in a given context) microaggressions in the last six months. Higher scores indicated more microaggression exposure. Blood draws were conducted after survey administration to collect high-sensitivity C-reactive protein (hsCRP) concentrations. The mean age was 26.54 (SD = 0.89) and the sample was majority non-white (74.55%). Linear regression was utilized to evaluate the association between the two microaggression subscales and CRP separately. Models were adjusted for race/ethnicity, age, smoking status. Environmental microaggressions were positively associated with CRP ($b = 0.01, p = 0.045$). Interpersonal microaggressions were not related to CRP. Findings suggest YGBM who experience more environmental microaggressions may be at increased risk for CVD. Surprisingly, interpersonal microaggressions were not associated with CVD. Our results indicate the biological consequences (e.g. CVD) to experiencing discrimination in the environment among YGBM should be addressed. Findings emphasize the need to further explore; 1) the association between discrimination (i.e. microaggressions) and CVD risk among YGBM and the 2) the particular modifiable mechanisms linking discrimination and CVD risk.

257) Abstract 1770

A SYSTEMATIC REVIEW OF LGBTQ COMMUNITY CONNECTEDNESS AND PHYSICAL AND BEHAVIORAL HEALTH OUTCOMES

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Background: Much of the existing LGBTQ health literature shows that LGBTQ people have worse health outcomes and engage in more harmful health behaviors than non-LGBTQ people. However, a number of studies contradict these findings. Previous research supports the idea that identifying as a member of a social group predicts better health and greater well-being. Identifying with the LGBTQ community may affect some of the health outcomes experienced by LGBTQ people. This project examines existing research on the relationship between identification with the LGBTQ community and indicators of physical and behavioral health for LGBTQ people.

Method: Six major databases were searched for studies including measures of LGBTQ community identification and measures of health. Thirty-two eligible articles were identified and coded for thematic elements. Articles were coded for LGBTQ identities, indicators of physical and behavioral health, and measures of LGBTQ community connectedness.

Results: The majority of the articles identified used samples that were mostly, or exclusively, cisgender men who have sex with men. The distinct health outcome categories substance use, sexual behavior, physical health status, and utilization of health services emerged from this review. The majority of measures focused on substance use and sexual behaviors. LGBTQ community identification measures often included adaptations of previously validated measures of feelings of connectedness to the LGBTQ community and active involvement with LGBTQ community events and spaces.

Discussion: Findings indicate the majority of existing research focuses on the health of cisgender gay and bisexual men, resulting in

little to no data on already underrepresented populations (e.g. sexual minority women and transgender and non-binary individuals). Additionally, most of the LGBTQ health literature focuses on sexual risk-taking and substance use, ignoring other health issues that have been shown to differentially affect LGBTQ people. Results demonstrate consistent patterns in the type of research being conducted in this field, as well as highlight areas for improvement. Findings from this literature review are part of a forthcoming meta-analysis.

258) Abstract 1531

CHILDHOOD ADVERSITY AND THE PSYCHO-BEHAVIORAL RESPONSE TO MINDFULNESS BASED STRESS REDUCTION IN WOMEN DIAGNOSED WITH BREAST CANCER

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Childhood adversity increases vulnerability for behavioral symptoms in women diagnosed with breast cancer, which may delay cancer recovery. Previously, we found that exposure to childhood adversity relates to more prolonged elevations in stress-related symptoms from breast cancer diagnosis through early survivorship. Recently we reported that MBSR reduces the psychological stress and behavioral symptoms, which accompany breast cancer diagnosis. The purpose of this study was to determine whether exposure to childhood adversity influenced the psycho-behavioral benefit of a Mindfulness-Based Stress Reduction (MBSR) intervention in women with early-stage breast cancer. Women were randomized to either MBSR or an active (education) control condition. They completed psychometric instruments at pre-, mid-, and completion of the program, as well as at 1- and 6-months post-program. For the present study only women who were randomized into the MBSR group ($n=84$) were analyzed. A subsample of these women ($n=29$) completed the Child Trauma Questionnaire. Hierarchical linear modeling (HLM) was used to analyze trajectories of outcomes over time. Models controlled for age, BMI and comorbidities. Women who participated in MBSR training reported a significant increase in mindfulness (Five Facets of Mindfulness Questionnaire) over time. However, women who reported greater childhood adversity had lower levels of mindfulness at baseline relative to women with less childhood adversity; yet they exhibited a more rapid increase in mindfulness over time to achieve similar levels in mindfulness as women experiencing lower levels of childhood adversity. More rapid increase in mindfulness, specifically non-reactivity to inner experience, was associated with faster improvements in depressive symptoms, fatigue, sleep disturbance and quality of life, regardless of exposure to childhood adversity. The findings demonstrate that despite greater stress vulnerability and lower baseline levels of mindfulness, women with a history of childhood adversity readily respond to MBSR with a more rapid increase in mindfulness and corresponding improvement in behavioral symptoms. The findings also emphasize development of 'non-reactivity to inner experience,' may be a key facet of mindfulness predictive of improvements in behavioral symptoms and quality of life in women with breast cancer.

259) Abstract 1326

ATTACHMENT ANXIETY MEDIATES BETWEEN CHILDHOOD ADVERSITY AND SOMATIZATION

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Background: Somatization can be operationalized as the presence of high physical symptom severity and/or high health anxiety. Each of

symptom severity and health anxiety are associated with impaired health, and elevated morbidity and health care utilization. Although its prevalence depends on definition, somatization is common in primary care (about 20%). Childhood trauma and attachment insecurity are known to be associated with somatization. Attachment insecurity consists of two dimensions, attachment anxiety (preoccupation with separation or abandonment, hypervigilance) and attachment avoidance (dislike of close relationships). We hypothesize that both dimensions of attachment insecurity mediate between childhood trauma and somatization. **Methods:** Adult primary care patients ($N = 248$, 70% women) completed a cross-sectional survey study using validated measures. Statistical analyses were performed using Hayes's PROCESS macro in SPSS. **Results:** The mean age was 45. The majority of participants were white, married or common law, in very good health and had a university education. Twelve percent of participants endorsed high physical symptom burden, 10% endorsed high health anxiety and 16% endorsed both. Sixty-seven percent of participants reported one or more categories of childhood adversity. The most common physical symptoms were trouble sleeping, low energy and back pain. Attachment anxiety, but not attachment avoidance mediated between childhood trauma and health anxiety (CI: .244 to .783). This relationship remained significant after controlling for depression (CI: .028 to .314). Regarding physical symptom burden, attachment anxiety, but not attachment avoidance mediated between childhood trauma and this outcome (CI .116 to .396) in unadjusted analysis, but the result was non-significant when controlling for depression (CI: -.005 to .126). **Conclusions:** Attachment anxiety may mediate between childhood adversity and health anxiety. This suggests that health anxiety may be elevated in people who have experienced childhood adversity because of processes related to attachment anxiety, such as hypervigilance for internal threats and feeling unsupported. These findings may help physicians better understand their patients' psychosocial circumstances and facilitate better communication.

260) Abstract 1882

CHILDREN WITH ADD HAVE BENEFIT FROM BODY-ORIENTED THERAPY

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Objectives:

It is known that children with ADD have deficit in cognitive and executive abilities. We have revealed that body-oriented therapy can impact executive abilities in 6-7 years age children with ADHD (Kiselev & Parshakova, 2018). The goal of this study was to reveal effect of body-oriented therapy on executive abilities in 4-5 years of age children with ADD. We compared the efficacy of two methods of treatment (body-oriented therapy for children vs. conventional motor exercises) in a randomized controlled pilot study.

Methods:

13 children with ADD between 4 and 5 years of age were included and randomly assigned to treatment conditions according to a 2x2 cross-over design. The body-oriented therapy included the exercises from yoga and breathing techniques.

To assess the executive functions and attention in children we used 4 subtests from NEPSY (Tower, Auditory Attention and Response Set, Visual Attention, Statue). Effects of treatment were analyzed by means of an ANOVA for repeated measurements.

Results:

The ANOVA has revealed ($p < .05$) that for 3 subtests (Auditory Attention and Response Set, Visual Attention, Statue) the body-oriented therapy was superior to the conventional motor training, with effect sizes in the medium-to-high range (0.49-0.86).

Conclusions:

The findings from this pilot study suggest that body-oriented therapy has a positive effect on executive functions in 4-5 years age children with ADD. It influences predominantly the selective and sustained attention, inhibition, monitoring, and self-regulation. However, it has

no effect on planning and nonverbal problem solving. However, it is necessary to do further research into the impact of body-oriented therapy on ADD children.

261) Abstract 1851

ANALYSIS OF BRAIN NETWORKS OF SCHIZOPHRENIA PATIENTS AND HEALTHY CONTROLS

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How intelligent one is depends on his or her brain network interactions. Highly connected brain nodes and edges tend to have more information flow and exchange than less connected ones. Mostly schizophrenia(SZ) patients have declined communication activities in their brain regions. The characteristic effect of SZ is psychosis and this calls for urgent need to scrutinize the brain network of these patients with the requisite tools and methods which could help unravel this disorder. To overcome these challenges, we are motivated to analyze the brain network of SZ patients and compare them to those of healthy controls(HC) using an information theoretic tool-Transfer Entropy(TE) and conventional method- Granger Causality(GC). We first analyze both groups with TE and GC and evaluate the performances of these two estimators under edges recovered to see which one could unearth both the linear and nonlinear signals in the brain measured by Electroencephalogram(EEG). Thereafter, we apply the two methods on P300 task data to construct effective connectivity causal interactions in HC and SZ. The simulation results as well as the application on the EEG data clearly depict that TE outperformed GCA in both conditions revealing the deteriorated brain networks in SZ patients. Thus in exploring the brain networks of HC and SZ, TE could be a better choice for clinicians to know the true brain network states of these two groups.

Key Words: Electroencephalogram, Granger Causality, Schizophrenia, Transfer Entropy.

262) Abstract 1370

ASSOCIATIONS OF SOMATIC DEPRESSIVE SYMPTOMS WITH FOOD ATTENTIONAL BIAS AND EATING BEHAVIORS

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Recent evidence suggests that atypical major depressive disorder (MDD) – whose key features include the reversed somatic symptoms of hyperphagia (increased appetite) and hypersomnia (increased sleep) – is a stronger predictor of future obesity than other MDD subtypes. The mechanisms underlying this relationship are unclear. Thus, the present study sought to examine associations of atypical depressive symptoms with food attentional bias (increased attention to food cues), emotional eating (eating in response to negative emotions), external eating (eating in response to external food cues), and restrained eating (controlling food intake). This cross-sectional laboratory study included 103 young adults enrolled at a Midwestern university (mean age=20 years, 79% female, 26% non-White, mean BMI=23.4 kg/m²). We measured total depressive symptom severity and individual symptoms of hyperphagia, poor appetite, hypersomnia, and disturbed sleep using the Hopkins Symptom Checklist (SCL-20); food attentional bias using a food Stroop task; and self-reported eating behaviors using the Dutch Eating Behavior Questionnaire. Table 1 shows the results of our demographics-adjusted linear regression models. Surprisingly, *hyperphagia* was negatively associated with food attentional bias. As hypothesized, *hyperphagia* was positively associated with emotional eating, and *poor appetite* was negatively associated with both emotional eating and external eating.

Unexpectedly, *hypersomnia* was negatively associated with emotional eating. In contrast, *disturbed sleep* was positively associated with both food attentional bias and emotional eating. Of note, the SCL-15 (mean of all SCL-20 items excluding sleep and appetite items), which was included in each model, was positively associated with emotional eating and restrained eating in separate models ($ps \leq 0.009$). The complex pattern of results we observed highlights the importance of examining the direction of somatic depressive symptoms when studying their potential influence on eating-related and obesity outcomes. Ultimately, this line of research could identify a subgroup of people with depression at greatest risk for future obesity and the mechanisms responsible for this elevated risk. Once identified, the underlying mechanisms could be tested as targets of future obesity prevention programs.

Table 1. Linear Regression Models Examining Associations of Somatic Depressive Symptoms with Food Attentional Bias and Eating Behaviors

	Hyperphagia			Poor Appetite		
	b	SE of b	p	b	SE of b	p
Food Attentional Bias	-47.62	18.77	0.01	-5.47	22.13	0.81
Emotional Eating	0.39	0.11	<0.001	-0.41	0.11	<0.001
External Eating	0.13	0.08	0.10	-0.19	0.09	0.03
Restrained Eating	0.06	0.10	0.52	-0.04	0.11	0.70

	Hypersomnia			Disturbed Sleep		
	b	SE of b	p	b	SE of b	p
Food Attentional Bias	12.63	16.22	0.44	47.46	19.29	0.01
Emotional Eating	-0.15	0.07	0.04	0.16	0.07	0.02
External Eating	-0.07	0.08	0.37	0.06	0.07	0.38
Restrained Eating	0.08	0.08	0.34	-0.02	0.08	0.75

Note: N = 103. Each somatic depressive symptom was examined in a separate model. All models were adjusted for age, sex, race/ethnicity, residential status, body mass index, state hunger, alcohol use, cannabis use, and SCL-15. SCL-15 = mean of all Hopkins Symptom Checklist items excluding sleep and appetite items.

263) Abstract 1205
THE RELATIONSHIP BETWEEN BASELINE HEART RATE VARIABILITY AND DEPRESSION FOR BLACK AMERICANS: GENDER AS A MODERATOR

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Evidence consistently indicates that lower resting heart rate variability (HRV), an indicator of parasympathetic nervous system cardiac modulation, is associated with depression. However, this relation has been shown to be inconsistent among Black Americans (Keen et al., 2013), as well as among men compared to women (Thayer, et al., 1998; Chambers & Allen, 2007). In the present study, we explored the relationship between baseline HRV and depression in a sample of Black adults (N = 195, Mean Age = 20.97, 69% female) and the moderating effect of gender. HRV was collected during a 5-minute baseline and depressive symptoms were assessed using the Depression, Anxiety & Stress Scales (DASS-21). Controlling for BMI and age, lower resting HRV marginally predicted greater depressive symptoms (B = -.06, SE = .03, p = .051); however, gender significantly moderated the association between resting HRV and depression (B = .04, SE = .02, p = .015). Specifically, Black women exhibited a positive association between baseline HRV and depressive symptoms (B = .02, SE = .01, p = .012); while Black men showed an inverse relationship between baseline HRV and depressive symptoms (B = -.02, SE = .02, p = .222). Both depression and low resting HRV are established risk factors for cardiovascular disease and mortality.

264) Abstract 1027
ATTACHMENT STYLE AND RECALLED PARENTING BEHAVIORS AS PREDICTORS OF THE DEGREE OF SOCIAL ANXIETY IN SOCIAL ANXIETY DISORDER

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Previous studies have shown that attachment style and recalled parenting behaviors are important for the development of social anxiety, however, studies that investigate these factors together are lacking.

579 persons with social anxiety disorder (SAD, 42% men, age 41.0 ± 14.2) were examined in the framework of the Social Phobia Research project at the Psychosomatic Clinic of the University of Bonn and compared with 90 healthy control subjects (37% men, age 35.2 ± 15.0). In addition to the Structured Clinical Interview on the diagnosis of Axis I disorders according to DSM-IV, the Attachment Styles Questionnaire (ASQ), the Parental Bonding Instrument (PBI), the Social Phobia Inventory (SPIN) and the Beck Depression Inventory (BDI) were used. The groups were compared by covariance analysis (covariate age, sex, depression (BDI)). The influence of Attachment Style (ASQ) and recalled parenting behavior (PBI) on Social Anxiety (SPIN) has been further investigated through linear regression and mediator analysis.

Patients with SAD showed significantly lower levels of secure attachment (p<0.001, d = 0.6) and higher levels of anxious-preoccupied (p <0.001, d = 0.8) and fearful-avoidant (p <0.001; d = 0.8) attachment. With respect to recalled parenting behavior, they showed significantly lower levels of care by father and mother (both p <0.001, d = 0.51, d = 0.4), and stronger paternal (p = 0.033, d = 0.2) and maternal (P = 0.001, d = 0.3) control. In a linear regression analysis the predictors attachment style and recalled parenting behavior predicted 27% (R^{2adj.} = 0.27) of the degree of social anxiety (SPIN) in the study group. The predictors secure attachment style (β = -. 263, p <0.001), anxious-preoccupied attachment style (β = 0.210, p = 0.001) and paternal control (β = 0.179, p <0.001) made the largest contribution to the explanation of variance. A mediator analysis showed that the remembered paternal control is a weak partial mediator between secure or ambiguous attachment style and social anxiety.

The findings emphasize the importance of attachment style and recalled parenting behavior for the degree of social anxiety. The therapeutically interesting implications of the influence of paternal control on attachment and anxiety symptoms should be investigated in further studies.

265) Abstract 1580
GENDER DIFFERENCES IN SEXUAL FUNCTION AMONG AN URBAN OPIOID USE DISORDER TREATMENT POPULATION

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Background: Improving quality of life is one goal of substance use treatment. Sexual health is an integral part of wellbeing. International studies, mostly of men, suggest sexual dysfunction is common among individuals receiving pharmacotherapy for opioid use disorder (OUD). Limited research exists describing sexual dysfunction in individuals, especially women, on pharmacotherapy for OUD in the United States. **Objective:** To describe and compare sexual dysfunction and associated factors between men and women with OUD receiving pharmacotherapy.

Methods: Patients were recruited from an urban, outpatient, substance use treatment clinic to complete a voluntary, electronic, cross-sectional survey from July-September 2019. Those with OUD using buprenorphine who completed a sexual function screen were included. For women, the 6-item Female Sexual Function Index was used. Total scores range from 6-30; <19 indicates sexual dysfunction. For men, the 11-item Brief Sexual Function Inventory was used (0-4 Likert scale). Mean score < 3 was considered sexual dysfunction. Descriptive statistics were calculated. Chi square was used to test differences by gender. Gender-stratified logistic regression was used to identify factors associated with sexual dysfunction.

Results: Overall, 162 patients completed the survey (97% response rate). Most (n=95) met inclusion criteria: 49.5% men and 50.5% women. Many identified as Black (72.6%), heterosexual (76.8%), single (69.5%) with average age of 43.8±12.3 years. Among women, 31.3% reported sexual dysfunction and 39.6% reported sex life dissatisfaction. For men, 57.4% reported dysfunction and 44.7% reported dissatisfaction. Across gender, men reported significantly more dysfunction than women ($p=.010$), but not dissatisfaction ($p=.615$). Chronic pelvic pain, chronic pain, psychological comorbidity, lack of healthcare access, intimate partner violence, and substance use treatment episodes were not significantly associated with sexual dysfunction for men or women. For women, increased age was significantly associated with greater likelihood of sexual dysfunction ($p=.032$).

Conclusions: Approximately 1 in 3 women and 1 in 2 men with OUD receiving pharmacotherapy report sexual dysfunction. Integration of sexual health services into addiction treatment could help improve sexual health and overall wellbeing.

266) Abstract 1786

SOCIAL SUPPORT AND MENTAL HEALTH IN MILITARY FAMILIES: A META-ANALYSIS

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Social support is typically considered a resource provided by a person or organization in one's network that enhances well-being or protects against stressors (e.g., House, 1981; Lin, 1986; Shumaker & Brownell, 1984). Among military Service members and spouses, social support is generally high (e.g., Gewirtz et al., 2010; Shallcross et al., 2016; Shea et al., 2013), however, major life events and changes unique to military service can necessitate Service members and spouses to continually rebuild their social support network (e.g., Jennings-Kelsall et al., 2010; Nichols et al., 2013). Many studies have demonstrated the importance of social support in fostering good mental health among Service members and their spouses, however, no work to date has statistically combined findings across studies. This meta-analysis examined the associations between social support and mental health disorders, specifically depression (13 studies), anxiety (4 studies), and PTSD (16 studies), among military Service members and their spouses. Using a varying coefficient method, this study aggregated effect sizes from previous research with samples collected after 9/11/2001, tested for potential bias among studies, and examined potential moderators, including component (e.g., Active versus Reserve) and source of social support. Results indicated that greater social support was consistently related to fewer mental health symptoms across all three disorders: $r = -.259$ for depression, $r = -.302$ for anxiety, and $r = -.287$ for PTSD. Furthermore, this association was stronger among samples comprising only Active Component Service members. Results also showed that support from family and friends had a weaker association with PTSD symptoms, compared to support from general sources. These findings clearly demonstrate the critical importance of social support for mental health, especially among Active Component Service members. The ongoing daily demands of

Active Component service (compared to the intermittent demands of Reserve Component service) may make finding social support particularly critical. Regardless of component, advocating for and developing opportunities for military families to enhance their social support may help reduce the prevalence of depression, anxiety, and PTSD symptoms in these communities.

267) Abstract 1708

SES DIFFERENCES IN DIURNAL CORTISOL SLOPE: THE ROLE OF SOCIAL ZEITGEBERS

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Low socioeconomic status (SES) has been associated with premature morbidity and mortality, and many studies demonstrate SES differences in diurnal cortisol secretion, an indicator of HPA-axis functioning, as well. Specifically, people of lower SES demonstrate flatter, or more dysregulated, diurnal slopes than their high SES counterparts. The mechanisms accounting for this effect, however, are relatively unknown. Variability in social zeitgebers, or daily factors that help entrain biological clocks (i.e. meal times, sleep times), is one possible mechanism through which SES relates to cortisol slope. Variability in the timing of social zeitgebers has been linked to dysregulation of cortisol patterns. To our knowledge, no work has investigated the link between social zeitgebers, SES, and cortisol. The present study seeks to fill this literature gap.

Participants included 391 adults aged 40-64 (39% male) with no history of cardiovascular disease (SHINE cohort, Univ of Pittsburgh). The participants completed a 4-day ambulatory monitoring protocol in which they provided hourly reports of meals, daily reports of sleep, and salivary cortisol samples collected 5 times a day. Demographic characteristics were assessed at baseline.

Daily diurnal cortisol slope was calculated using within-subject regression; resulting scores were averaged across days. Linear regressions were run between SES (z-scored education & income), social zeitgebers (variability in meal time and sleep midpoint), and cortisol patterns. All regressions controlled for age, race, and gender. SES emerged as a significant predictor of cortisol slope ($B = -0.007, p = .018$). SES was associated with variability in sleep midpoint (VSM) ($B = -0.19, p < .001$) as well. Greater VSM associated with flatter cortisol slope ($B = 0.008, p = .038$), and bootstrapped tests of indirect effects showed that VSM partially accounted for the association between SES and cortisol slope ($B = -0.0014, p = .033$, 95% CI: -0.0032, -0.0001). Variability in meal times was not associated with SES or cortisol slope in this sample.

Socioeconomic differences in diurnal cortisol slope may be partly accounted for by increased variability in social zeitgebers, such as nightly sleep timing. These results have implications for understanding mechanisms linking SES to health, as well as for the development interventions. Supported by AG041778.

268) Abstract 1169

THE ROLE OF ANXIETY-RELATED EMOTIONAL AROUSAL AND WORRY FOR BIOLOGICAL STRESS RESPONSE PATTERNS

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Background: Increased anxiety is accompanied by typical alterations of biological stress system activity as seen in increased autonomic responses as well as in lower hypothalamus-pituitary-adrenal (HPA) axis responses to acute stress. Thus, it appears to distort the coordinated stress response in individuals without anxiety disorder diagnoses. In this context, however, it remains unknown how emotional arousal and worry as sub-facets of anxiety influence

reactivity to stress. In particular, one would expect increased anticipatory emotional arousal (reflected in perceived autonomic arousal) and worry to equally predict pronounced physiological responses to stress.

Methods: In order to test this, 128 healthy adults (65.6% female, $M_{age}=25.17$ years, $SD_{age}=6.31$) completed the Trier Social Stress Test. Saliva samples were collected 1 min before as well as 1, 20, 30, 45, and 60 minutes after stress to evaluate cortisol secretion over time. In a subsample of participants ($n=79$, 64.6% female, $M_{age}=25.52$ years, $SD_{age}=7.18$), heart rate variability (HRV) was recorded throughout the session. Anticipatory anxiety was assessed using a German-language anxiety inventory (STADI) prior to the TSST.

Results: Multiple regression analyses revealed that higher levels of emotional arousal significantly predicted lower HPA axis responses to stress ($\beta=-.26$, $p=.01$, $\Delta R^2=.08$, $p=.03$), whereas worry was unrelated to HPA axis responses to stress ($p>.05$). Higher levels of worry, however, significantly predicted greater decreases in HRV ($\beta=-.37$, $p=.01$; $\Delta R^2=.12$, $p=.04$) whereas emotional arousal was unrelated to autonomic responses to stress ($p>.05$). These results were independent of age, BMI, and sex.

Conclusions: This investigation demonstrates that anticipatory emotional arousal and worry do not uniformly relate to biological reactivity to stress and contributes to the understanding of how anxiety may impair the coordinated stress response.

269) Abstract 1441

RECUMBENT ISOMETRIC YOGA ALTERS CIRCULATING MICRORNA IN PATIENTS WITH MYALGIC ENCEPHALOMYELITIS/CHRONIC FATIGUE SYNDROME

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Background: Yoga is one of the representative mind-body therapies. Our previous studies have demonstrated that recumbent isometric yoga program reduces fatigue in patients with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) (Oka T et al., *Biopsychosocial Med* 2017;11:5). However, the underlying mechanisms for how recumbent isometric yoga improves fatigue in these patients remain unclear. Several studies have suggested that micro-ribonucleic acid (miRNA) expression in ME/CFS patients is different from healthy subjects. However, to date, it has not been determined if the practice of recumbent isometric yoga can affect miRNA expression. Therefore, we investigated if isometric yoga changes the expression levels of serum miRNA in patients with ME/CFS.

Methods: The pilot study included nine patients with ME/CFS who failed to show satisfactory improvement after at least 6 months of treatments administered at our hospital. Patients practiced recumbent isometric yoga for 3 months; they met with a yoga instructor every 2 to 4 weeks and participated in daily in-home sessions. The effect of recumbent isometric yoga on fatigue was assessed by scores on the 11-item Chalder fatigue scale (FS) pre- and post-intervention. Patient blood samples were also drawn at the respective time points and the serum was used for exhaustive microRNA array analysis.

Results: The average Chalder FS score decreased significantly (from 25.3 ± 5.5 to 17.0 ± 5.8 , $p<.001$, paired t-test) after practicing recumbent isometric yoga for 3 months. miRNA microarray analysis revealed that 4 miRNAs were significantly upregulated, and 42 miRNAs were downregulated after the intervention period.

Conclusions: This pilot study is the first to demonstrate that regular practice of recumbent isometric yoga changes serum miRNA levels. These miRNAs might represent biomarkers for the fatigue-relieving effect of recumbent isometric yoga in patients with ME/CFS.

Trial registration: University Hospital Medical Information Network (UMIN CTR) 000023472. Registered Aug 4, 2016.

270) Abstract 1781

EXAGGERATED HEART RATE RESPONSES TO ACOUSTIC STARTLE FOLLOWING AN ACUTE INFLAMMATORY CHALLENGE

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Elevated inflammation may play a key role in health inequities worldwide. Low socioeconomic status, chronic and traumatic stressors, and adverse environmental exposures have all been linked with elevated levels of inflammatory markers. A large body of research from rodents indicates that elevated inflammation can elicit exaggerated threat sensitivity. Even though exaggerated threat sensitivity can underlie anxiety, hypervigilance, anger and irritability, sleep disturbance, impaired decision-making, and poor health behaviors, little is known about the effects of inflammation on threat sensitivity in humans. The polysaccharide form of the typhoid vaccine elicits an acute inflammatory response and provides a useful tool for experimentally examining the effects of inflammation. In the present study, twenty-four healthy males (Mean age = 38.1 ± 13.4 ; Range = 20-60) were randomized to receive either the typhoid vaccine or placebo. Blood was drawn immediately before and at 2 and 4.5 hours after vaccine/placebo. At approximately 3 hours post-vaccine, we administered a fear-potentiated startle paradigm to assess physiological reactivity to startling sounds under low, medium and high threat. Participants who received the typhoid vaccine showed increases in interleukin-6 at 4.5 hours, $F(1,20)=6.85$, $p=.02$, and tumor necrosis factor- α at 2 hours, $F(1,21)=7.38$, $p=.01$, as well as increases in the number of white blood cells, $F(1,19)=7.80$, $p=.01$, and neutrophils, $F(1,19)=7.23$, $p=.02$, and a trend towards greater increases in monocytes, $F(1,19)=4.04$, $p=.059$, at 4.5 hours. There were no differences between groups in lymphocytes, platelets or C-reactive protein. A linear mixed effect analysis revealed a significant interaction between vaccine and threat condition for heart rate reactivity to the acoustic stimuli, $F(1,19)=6.55$, $p=.019$. Follow-up tests revealed that typhoid vaccine compared to placebo was associated with greater heart rate reactivity under low ($t=2.21$, $p=.039$), but not ambiguous or high threat. The typhoid vaccine elicits an inflammatory response and exaggerated heart rate responses to acoustic startle stimuli under low threat conditions. Thus, inflammation may cause exaggerated threat sensitivity. A better understanding of the effects of inflammation on threat sensitivity may point us in the direction of new interventions to reduce health inequities.

271) Abstract 1118

THE INFLUENCE OF ACCULTURATION ON THE PERSONAL RELEVANCE OF PSYCHOTHERAPY TO ASIAN AMERICANS

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Objective: Conventional evidence-based interventions ignore cultural variables that impact the mental health of ethnic minority populations. Culturally-adapted interventions are beneficial for groups of color but may fail to consider individual variables. These limitations may contribute to existing mental health utilization disparities. A precision medicine approach to personally relevant interventions for diverse groups may be the next step.

The main objective of this study was to assess the personal relevance of Problem Solving Therapy (PST) and Cognitive Behavioral Therapy (CBT) to Asian Americans (AAs), with convergent data from neuroimaging and self-report measures. We also investigated the moderating effect of acculturation on personal relevance and related cultural variables. We hypothesized PST would be more personally relevant than CBT for low-acculturated AAs because its external problem-solving approach is less likely to conflict with Asian values.

Procedure: We recruited 28 AA participants from the community. Thirty-six percent were first-generation, 43% second-generation, and 21% third-generation.

Using fMRI, we acquired whole-brain functional neuroimages as participants completed a task assessing the self-relevance of treatment content from PST and CBT. We used a voxel-wise p-value of .005 and a cluster-extent threshold of 150 to adjust for multiple comparisons. After being scanned, participants completed self-report questionnaires.

Results: There was significantly greater activation in self-processing regions when participants viewed PST vs. CBT content, including the medial and ventromedial prefrontal cortex and ventral striatum. First- and second-gen AAs experienced greater activation in self-processing regions when viewing PST vs. CBT content than third-gen AAs.

Self-report ratings were not correlated with activation in self-processing regions and significant preference for PST or CBT. Third-gen AAs identified more with their Asian identity than first- and second-gen AAs. No generational differences in the endorsement of Asian values and attitudes towards help-seeking were found.

Conclusions: AAs may prefer PST over CBT. First- and second-gen AAs (low-acculturated) preferred PST over CBT than third-gen AAs (highly acculturated). Neuroimaging may be more sensitive than self-report measures in determining personal relevance.

272) Abstract 1912

THE IMPACT OF HEART RATE VARIABILITY BIOFEEDBACK ON INHIBITORY CONTROL

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Previous studies have indicated that biofeedback interventions influence heart rate (HR) and its variability (HRV). Due to a well-documented correlation of HRV with cognitive control, we hypothesized that increases of HRV induced by an 8-week HRV biofeedback training are accompanied by improvements of behavioral inhibition. Furthermore, we investigated changes of neural activation during the task due to biofeedback.

Biofeedback intervention was applied over eight weeks in order to enhance HRV in 16 healthy subjects (7 females; 30.5 ± 9.4 y). HR was assessed by a chest belt (H10; Polar Electro) and displayed on the mobile phone (EliteHRV 4.2.1, Elite HRV LLC). In five sessions per week, subjects trained to synchronize their breathing pattern with their cardiac rhythm. A control group with 11 subjects (6 females; 30.0 ± 12.6 y) played three different *jump'n'run* games instead of performing the biofeedback training. All participants performed a Go/NoGo task before and after the intervention with simultaneous HR recording and functional magnetic resonance imaging.

In the biofeedback group, HRV during the task increased by 21% while heart rate dropped by 4.8 beats per minute after the intervention. The control condition did not influence cardiac regulation. Increases of HRV were correlated with increases of accuracy in NoGo-trials (Spearman $\rho = 0.41$, $p < 0.05$). However, in neither group we found significant changes of performance. Functional MRI revealed that participants after biofeedback needed less activation in the precuneus, occipital gyrus, cerebellum, temporal gyrus, and parietal gyrus during successful response inhibition in NoGo-trials.

Our results show that increased vagal modulation induced by HRV-biofeedback is accompanied by changes in brain activations during response inhibition.

273) Abstract 1699

THE EFFECT OF POLYGENIC RISK AND THE NEIGHBORHOOD ENVIRONMENT ON FASTING GLUCOSE IN THE GENE-FORECAST STUDY

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Diabetes is the 7th leading cause of death in U.S. and arises from a combination of environmental and genetic factors. However, we do not fully understand how such factors interact to affect disease risk. In this study, we sought to assess whether: 1) a previously developed polygenic risk score for diabetes developed in a multi-ethnic sample was associated with fasting glucose in an African American only sample, 2) neighborhood factors were associated with fasting glucose, and 3) the effect of the polygenic risk score on fasting glucose was modified by neighborhood factors.

We use data from 300 African Americans enrolled in the GENE-FORECAST sample. Neighborhood factors were collected via survey and included physical and social environmental measures. Likert scale responses were summed, and scores were divided into quartiles for analyses. Genotypes were obtained using the Illumina MEGAchip, and polygenic risk scores for each participant were calculated by summing the number of diabetes risk alleles. Multivariable linear regression adjusting for age and sex was used to assess the aforementioned associations.

Notably, the polygenic risk score was not significantly associated with fasting glucose in the study sample. The neighborhood physical environment was significantly associated with fasting glucose where the top neighborhood quartile (i.e. most advantaged) had lower glucose levels than the bottom quartile ($\beta = -13.40$, $p = 0.029$). There was also a marginally significant association between the neighborhood social environment and fasting glucose where the top neighborhood quartile had lower glucose levels than the bottom quartile ($\beta = -11.08$, $p = 0.069$). Since the polygenic risk score did not have a significant main effect on fasting glucose, we did not test whether there was an interaction effect with the neighborhood environment.

The present study highlights the lack of portability of polygenic risk scores between different racial/ethnic groups. A better understanding the genetic predictors of diabetes in the African American population is needed before polygenic risk scores have clinical utility for this group. Consistent with the literature, we found that the neighborhood environment was an important contributor to diabetes risk. Intervention strategies should prioritize developing and sustaining healthy communities.

274) Abstract 1917

PATIENT PERCEPTIONS OF CHRONIC ILLNESS CARE AND HBA1C IN DIVERSE T2DM ADULTS: A CROSS-SECTIONAL ANALYSIS

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The Chronic Care Model (CCM) is a widely used, evidence-based framework for enhancing chronic disease care delivery in primary care. While there is evidence that CCM-based healthcare fosters positive clinical outcomes for patients with type 2 diabetes (T2D), the relationship between *patient* perceptions of CCM-congruent care and clinical control is less clear, especially among diverse populations. “Medical Assistant Health Coaching for Diabetes in Diverse Primary Care Settings” is an on-going, cluster-randomized controlled trial

comparing medical assistant health coaching to usual care in improving clinical and patient-reported outcomes among adults with poorly controlled T2D. Patients were recruited from two diverse health systems: Neighborhood Healthcare, a federally qualified health center system serving predominantly Hispanic, Spanish-speaking, low income patients, and Scripps Health, a large, non-profit health system serving predominantly non-Hispanic White, English-speaking, middle/upper income patients. Using electronic health record and survey data ($N=270$, M age = 61.9 ± 13.6 years, 58.5% female), we examined cross-sectional, baseline associations of patient perceptions of CCM-congruent care, using the Patient Assessment of Chronic Illness Care (PACIC), and glycosylated hemoglobin (HbA1c). We predicted higher PACIC scores would be associated with lower HbA1c values, after adjusting for age, sex, and health system. At baseline, only 26% of the sample met the American Diabetes Association recommendation of HbA1c $<7\%$ ($M = 8.8\% \pm 2.3\%$). Baseline PACIC scores reflected moderately to highly CCM-consistent care ($M = 3.6 \pm 1.2$ to 4.5 ± 0.9 out of 5). Linear regression models revealed that overall PACIC score was not significantly associated with HbA1c ($\beta=0.04$, $p=0.45$). Results did not differ when the sample was stratified by health system. Goal setting was the only subscale significantly related to HbA1c, such that greater frequency of collaborative goal setting was associated with higher HbA1c (i.e., poorer control; $\beta=0.33$, $p<0.001$). This could be because patients with poorer clinical control were more likely to receive additional support in this domain (e.g., care team more likely to encourage outside classes). Ultimately, further research is warranted to better understand which CCM domains and perspectives matter most with respect to clinical control.

275) Abstract 1116

ADVERSE CHILDHOOD EXPERIENCES AND COGNITIVE FUNCTION AMONG ADULTS WITH EXCESS ADIPOSITY

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Background: Adverse childhood experiences (ACEs) and obesity are independently associated with brain/neurocognitive health. Despite a growing emphasis on the importance of early life adversity on health, the relationship between ACEs and neurocognition in adults with overweight or obesity is unclear. The objective was to examine associations between self-reported ACEs and measured neurocognitive domains in a sample of adults with overweight/obesity. **Methods:** Participants were 95 predominantly white, highly educated adult women (76% female, 81% Caucasian, 75% \geq bachelor's degree) with excess adiposity enrolled in the Cognitive and Self-regulatory Mechanisms of Obesity Study. ACEs and fluid/crystallized neurocognitive domains were measured at baseline using the Adverse Childhood Experiences Scale and the NIH Toolbox Cognition Battery and Automated Neuropsychological Assessment Metric, respectively. **Results:** Higher ACEs scores were negatively correlated with fluid cognition ($r=-.34$, $p<.001$) but not crystallized cognition ($r=.01$, n.s.). Individuals with 3 and 4+ ACEs displayed significantly lower fluid cognition scores than those with fewer ACEs $F(4,89)=3.24$, $p<.05$. After accounting for BMI, age, sex, race, and education, higher ACEs scores were still associated with poorer performance on overall fluid cognition ($\beta=-.36$, $p<.01$), along with the following subtests: Stroop Color/Word test ($\beta=-.23$, $p<.05$), Go/No-Go omissions ($\beta=.29$, $p<.01$), and Picture Sequence Memory task ($\beta=-.30$, $p<.01$).

Conclusions: The role of ACEs in health may be related to their associations with executive function and episodic neurocognitive domains essential to cognitive processing in the context of self-regulation. Obesity science should further examine the role of ACEs and neurocognition in obesity prevention, prognosis, and treatment using more rigorous, prospective designs.

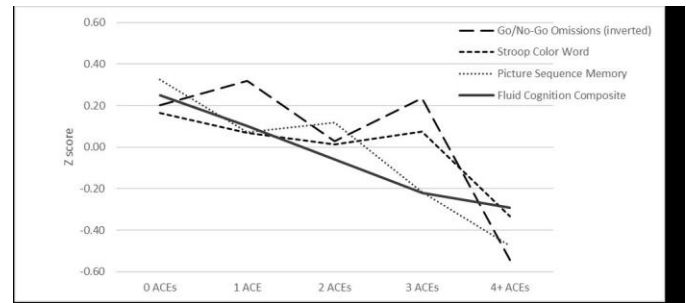


Figure 2. Fluid Cognition Performance across ACEs Groups

276) Abstract 1091

ADOLESCENT STRESS: A PREDICTOR OF DISORDERED EATING BEHAVIORS AND ATTITUDES IN YOUTH WITH OVERWEIGHT/OBESITY

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Objective: To examine associations between psychological stress and disordered eating behaviors (dieting, food preoccupation, binge eating behavior) and the heterogeneity of these associations by sex and race/ethnicity in a diverse sample of adolescents with overweight/obesity. **Methods:** One hundred and sixty-one adolescents between the ages of 13-19 years of age with overweight/obesity (65% female; 53% African American/47% non-Latino white; age: 16.7 ± 1.7 years) were recruited from Southeast MI and included in this analysis. Psychological stress was measured using the Perceived Stress Scale, and disordered eating behaviors were assessed using the Eating Attitudes Test (EAT-26) questionnaire. Multivariable linear regression and logistic regression models were conducted to examine the associations between psychological stress and disordered eating behaviors. **Results:** Psychological stress was associated with increased dieting ($\beta=0.17 \pm 0.06$; $p=0.01$) and food preoccupation ($\beta=0.04 \pm 0.02$; $p=0.02$). Psychological stress was not associated with increased binge eating ($OR=1.08 \pm 0.04$; $p>0.05$). There were no statistically significant differences in the association of psychological stress and disordered eating indices by sex or race/ethnicity. **Conclusions:** Psychological stress was associated with increased disordered eating behaviors in adolescents with overweight/obesity. No differences by sex and race/ethnicity were observed. Future studies should seek to identify the unique sources of psychological stress that contribute to differences in disordered eating behaviors among adolescents with overweight/obesity.

277) Abstract 1309

OBESEITY AND DEPRESSION IN LATINX ADULTS: FUTURE RESEARCH DIRECTIONS AND IMPLICATIONS FOR CLINICAL PRACTICE, RESEARCH, AND HEALTH POLICY

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Introduction. The aims of this presentation are to review the relationship between obesity and depression among Latinxs; provide recommendations and future research directions; and discuss implications for clinical practice, research, and health policy. **Method.** Articles from PubMed, PsycINFO, and Google Scholar were reviewed. An in-depth analysis of the literature was initiated and future research directions that can lead to culturally competent interventions in Latinx adults are

discussed. **Results.** Overall, research suggests that obesity can increase the risk for depression and vice versa. Variables such as race, ethnicity, and gender are important to consider; one study found that in Latinx women, the association between obesity and depression was especially pronounced (Heo, Pietrobelli, Fontaine, Sirey, & Faith, 2006). Furthermore, a study found that low-income, primarily immigrant, Latinx mothers have a higher risk of developing depression and obesity compared to the general U.S. population (Lindsay, Greaney, Wallington, Wright, & Hunt, 2017), which suggests that social context is an important factor. Similarly, length of U.S. residency also places obese and overweight Latinx mothers at a heightened risk for depression (Lindsay et al., 2017). In terms of depression as a predictor for obesity, a study found that atypical major depressive disorder and lifetime dysthymic disorder were strong predictors for obesity among all racial and ethnic groups (Polanka, Vraney, Patel, & Stewart, 2016). Another study found that long-term use of serotonin reuptake inhibitors could lead to weight gain in individuals with clinically diagnosed depression; however, race/ethnicity was not specifically discussed in this article (Schwartz, Nihalani, Virk, & Jones 2004). In addition, an intervention study found that depressive symptoms were significantly reduced in obese Latinxs following bariatric surgery (Nijamkin, Campa, Nijamkin, & Sosa, 2013). **Discussion.** The literature suggests an inconsistent relationship between obesity and depression in Latinxs. Future research should be conducted within and across different Latinx groups and samples, as well as explore differences based on the methodology used in studies. Recommendations and implications for clinical practice, research, and health policy are discussed as they relate to obesity and depression in Latinx adults.

278) Abstract 1811

CARDIAC VAGAL REACTIVITY: INTERACTIONS BETWEEN THE QUALITY OF SOCIAL INTERACTIONS AND INTERPERSONAL PARTNER AS A FUNCTION OF GENDER

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Background. Greater heart rate variability (HRV) is believed to be associated with heightened sensitivity to social processes and contexts. Little is currently known regarding whether the relationship between HRV and the quality of social interactions differs across classes of interpersonal partners (e.g., friend, spouse, children, family member, or other adult). Moreover, whether the greater social sensitivity of women is associated with a larger diversity of HRV responses as a function of with whom they interact in combination with the quality of their social interaction is unknown. Using ecological momentary assessment (EMA) methods and ECG holter monitoring, this study evaluated HRV and emotional responses to every-day negative and positive social interactions across social contexts.

Methods. Participants (N = 174) were monitored over a 5-day observation period using 24-hr Holter monitoring (ECG) and EMA to record current emotions and social interactions approximately every 30 minutes. Each EMA prompt queried participants regarding with whom they were currently with and the positive and negative aspects of the interaction.

Results. Multilevel models indicated a significant three-way interaction effect of interpersonal partner, quality of the social interaction, and sex on heart rate and HRV (RMSSD and HF Power). When participants reported being in a negative interaction with friend(s), they experienced significant reductions in HRV and increases in heart rate. This pattern was true for both men and women, but contrast effects demonstrated that women experienced significantly greater reductions than men in HF power, RMSSD, and heart rate.

Results from logistic multilevel models estimating emotional states demonstrated significant interactions between interaction quality and

interpersonal partner. Participants were less likely to report anger or sadness during a positive interaction with their spouse or child(ren) but were more likely to report sadness during a negative social interaction with their spouse.

Conclusions. These findings indicate that social interactions with friends are particularly associated with cardiac vagal reactivity with this linkage more evident in women than men.

279) Abstract 1906

THE ROLE OF INDIVIDUAL AND FAMILY HABITS IN OVERWEIGHT AND OBESITY TRENDS OF ADOLESCENTS: EVIDENCE FROM THE HEALTH BEHAVIOUR IN SCHOOL-AGED CHILDREN (HBSC) STUDY

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Background: Despite sustained efforts to tackle juvenile obesity, almost a third of European children and adolescents are overweight and obese with prevalence on a steady rise in most countries. We aimed to assess the trends in overweight and obesity from 2014-2019 and to analyse the extent to which they are influenced by changing patterns of physical activity, eating in front of screens/with family and SES.

Method: Cross-sectional data from 4 HBSC surveys (2005/2006, 2009/2010, 2013/2014, 2017/2018), summing up 16315 cases of adolescent aged 11, 13, and 15, were pooled and analysed across the 4 survey points, for BMI, physical activity over the past 7 days, eating in front of screens, family and weekend meals as well as socio-economic status (SES).

Results: Between 2006 to 2010, the rates of overweight and obesity increased overall with 4% in boys and with 2% in girls, reaching 26.6% and 11.8% in boys and girls, respectively (*ps* for trends <.001). Between 2014 and 2018 they markedly decreased in boys with more than 11% (reaching 17.8%) and with 6.3% in girls (reaching 10%) (*ps* for trends <.001). Age, followed by physical activity levels and SES were the greatest contributors to BMI in boys but not in girls. For girls, having family meals and breakfast during the weekends were more strongly correlated with BMI across time. Having meals in front of screens was not associated with BMI in either gender.

Discussion: This research brings valuable insights into the role of individual and family habits in BMI and shows that interventions should be focused on fostering how, with whom, and when to eat, alongside their engagement to promoting healthy food consumption and physical activity.

280) Abstract 1903

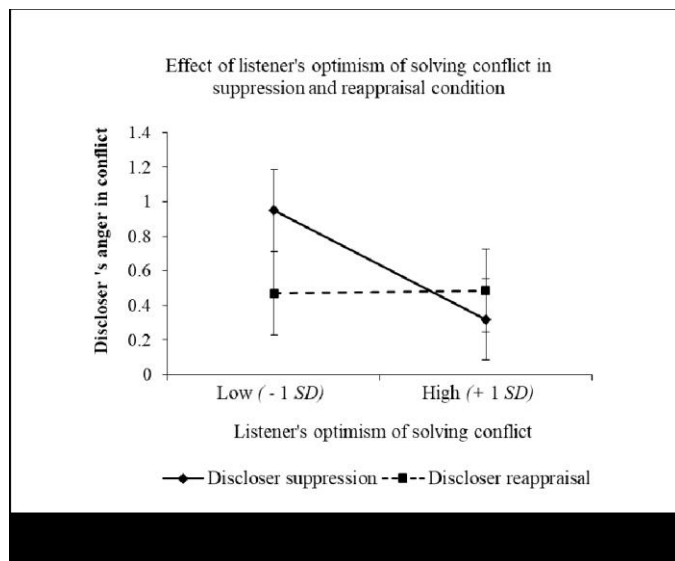
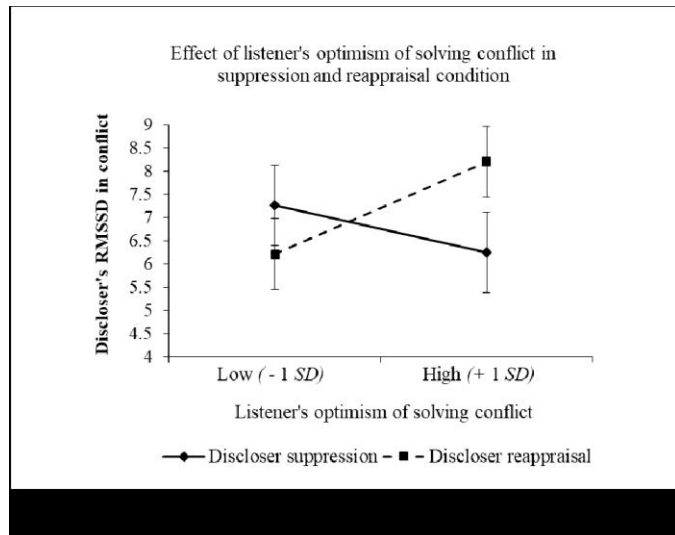
COGNITIVE AND EMOTIONAL TAXES: THE ROLES OF CONFLICT BELIEFS ON EMOTION REGULATION AMONGST COUPLES

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Dealing with romantic relationship conflicts taxes both cognitively and emotionally, and casts on many aspects of psychological and physical functioning for both dyadic members. It is widely established that suppression is a stronger physiological response compared to reappraisal given the former activates the sympathetic nervous system in emotionally challenging situations. The current research re-examines this association by introducing the relationship partner's conflict beliefs (viz., high vs. low optimistic in solving the conflict) as a potential moderator, aiming to illustrate how such interpersonal factor may influence an individual's cognitive effort consumed (viz., heart rate variability) and modulated emotional experience (viz., anger) in resolving a couple conflict.

Dating couples engaged in a videotaped discussion of their existing relationship conflicts while wearing Polar H10 heart rate sensors. The

discloser (randomly assigned) was manipulated to use either reappraisal or suppression emotion regulation strategy, while the listener was instructed to respond naturally during the discussion. Conflict beliefs were measured before the discussion. Actor-partner interdependence model analyses revealed that reappraisers experienced a less cognitively effortful regulation process (indexed by a larger RMSSD (the root-mean square differences of successive R-R intervals) than suppressors when their partner was more optimistic in solving the conflict (Figure 1). In parallel, reappraisers (vs. suppressors) were more able to down-regulate their anger when their partner was less optimistic (Figure 2). Implications regarding the dyadic nature of emotion regulation in resolving couple conflicts and its physiological mechanisms were discussed.



281) Abstract 1919 TASK STRAIN IS ASSOCIATED WITH CIRCULATING IL-6 DURING DAILY LIFE

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Acute stress has consistently been linked to increases in circulating levels of pro-inflammatory markers, including interleukin-6 (IL-6), in adulthood. However, little research has investigated non-laboratory, naturalistic acute stressors in relation to adult inflammation. Ambulatory assessments of stressors, paired with novel dried blood

spot IL-6 assays over multiple days, allows for testing these associations in everyday life.

In 391 healthy adults (Study of Health and Interactions in the Natural Environment, SHINE, aged 40-64, 54% female, 69% white), we collected hourly ratings of "task demand" and "task control" by smartphone using multi-item scales. Ratings were collected throughout the waking day during two 2-day periods over the course of a week. As an indicator of stress, we calculated the proportion of moments of task strain (i.e., above median task demand and below median task control). Participants collected dried blood spots for the assessment of IL-6. IL-6 values were log transformed and averaged to indicate each individual's mean IL-6 across the study period. $n=205$ participants provided daily dried blood spots, with 87% providing these on three or more days.

Preliminary analyses were conducted using a partial sample ($n=185$) due to ongoing assays. The proportion of task strain associated with averaged measures of IL-6 ($B=0.24$, $SE=0.10$, $p=0.02$). Furthermore, when accounting for demographic covariates and BMI, a significant task strain-by-race interaction was found ($B=0.46$, $SE=0.19$, $p=0.02$). There was a significant positive relationship between task strain and average IL-6 for Whites, whereas IL-6 levels were relatively high and constant across degrees of task strain for non-Whites (Figure 1). Day-level associations between task strain and IL-6 will continue to be explored, but these initial findings suggest a link between ambulatory measures of stress and inflammation in a naturalistic setting, which is moderated by race.

Supported in part by NIH grant R01 AG041778.

Relationship between IL-6 and Task Strain by Race

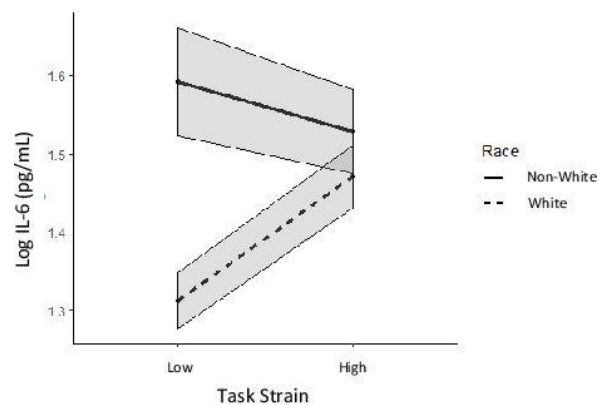


Figure 1.

282) Abstract 1550 PSYCHOLOGICAL PREDICTORS OF CLINICAL AND EXPERIMENTAL PAIN IN ADOLESCENTS WITH JUVENILE FIBROMYALGIA AND HEALTHY CONTROLS

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Juvenile fibromyalgia (JFM) is a disabling chronic pain condition affecting up to 6% of adolescents. JFM is characterized by widespread bodily pain, poor sleep, and reduced psychosocial functioning. Currently, there is no published data on whether sleep or psychological factors are associated with clinical and experimental pain reports in JFM populations. To address this gap, the current study enrolled healthy adolescents ($n=20$) and adolescents with JFM ($n=20$) between the ages of 12 and 17 ($M_{age}=15.89$, $SD=1.44$) to explore potential associations between sleep, psychological factors, and pain. Participants provided daily reports of sleep quality and clinical pain for seven days, completed several psychological measures, and underwent a short experimental pain battery to assess pressure pain threshold (PPT) via a pressure algometer and cold pain intensity. Cold pain

intensity was assessed by having participants use a visual analogue scale to report perceived pain intensity after 20 and 60 seconds of hand submersion in 10°C water. Linear regressions were used to assess the main effects of sleep and psychological measures as well as group interaction on each pain outcome. None of the measures predicted PPT (p 's >.05), but combining the JFM and healthy control group resulted in a main effect of negative affect such that it was significantly positively correlated with ratings of cold pain intensity after 20 seconds ($\beta=.43, p=.006$) and 60 seconds ($\beta=.39, p=.013$). A main effect of daily reported sleep quality revealed that it was significantly negatively correlated with daily reports of clinical pain ($\beta=-0.50, p=.010$). Further, we found a significant group interaction between sleep quality and cold pain intensity after 60 seconds ($\beta=-0.47, p=.039$). Specifically, in the JFM group, sleep was negatively but not significantly associated with cold pain intensity ($\beta=-0.37, p=.112$). In controls, the relationship between sleep and pain intensity was positive but less robust ($\beta=.31, p=.188$). These data suggest that sleep quality affects perceived experimental pain intensity in adolescents with JFM differently than it affects healthy adolescents. These findings have clinical implications because they suggest that treatments for JFM should also target these important psychological predictors of pain perception such as negative affect and sleep quality.

283) Abstract 1463

MODIFIED BIOFEEDBACK AS A POTENTIAL TREATMENT IN REDUCING CHRONIC PAIN RISK: A CONTROLLED TRIAL

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Chronic pain is associated with significant burden, health care utilization, and suffering. Unfortunately, pharmacological treatments (i.e., opioids) pose significant risks and side-effects, and non-pharmacological treatments (i.e., cognitive behavioral therapy) produce small short term effects. Two mechanisms that are believed to contribute to pain risk are impaired pain inhibition processes and augmented pain facilitation processes. This study examined whether a modified version of biofeedback is effective in increasing descending inhibition and decreasing pain facilitation. 84 healthy, pain-free participants were assigned to 1 of 3 biofeedback treatments that were administered across 3 sessions. For all 3 treatments, participants were provided brief psychoeducation and training in relaxation strategies, then their sympathetic arousal level (i.e., skin conductance) was displayed and they were asked to reduce their arousal. In the modified biofeedback (e.g., Conditioned Biofeedback) group, participants received painful electric stimulations during biofeedback that were surreptitiously controlled by their arousal level. This meant that successful relaxation and arousal reduction was accompanied by pain relief in this group. A Biofeedback Only group controlled for general effects of biofeedback/relaxation. A Biofeedback+Shock group (in which the stimulation intensity was not controlled by their arousal level) controlled for the effects of practicing biofeedback during painful shocks. Nociceptive flexion reflex threshold (NFR; a physiologic measure of spinal nociception) and temporal summation of pain (TS-pain; the degree to which pain increases/summates in response to a train of painful stimuli) assessed changes in descending inhibition and pain facilitation, respectively. Results indicated that all groups showed pre- to post-biofeedback increases in NFR threshold, but only the Conditioned Biofeedback group showed pre- to post-biofeedback reductions in TS-pain. Moreover, Conditioned Biofeedback resulted in a persistent (pre-biofeedback) increase in NFR threshold across sessions, whereas Biofeedback Only resulted in a persistent (pre-biofeedback) decrease in TS-pain. In sum, Conditioned Biofeedback may reduce chronic pain risk in healthy participants by increasing descending inhibition and reducing pain facilitation.

284) Abstract 1125

INFLUENCES OF FASTING ON STRESS RESPONSE AND WITHDRAWAL SYMPTOMS IN HABITUAL KHAT USERS

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Background: Fasting changes mood and physiological states. Substance use such as khat use is prohibited during Ramadan, a religious fasting. Habitual khat use is associated with increased negative affect and altered psychobiological stress responses. Effects of fasting on stress response, mood, and withdrawal symptoms among khat users have not been examined. **Methods:** In this study, 80 individuals completed ambulatory monitoring period and laboratory assessment session. Participants who completed the study while fasting during Ramadan were matched with those who completed the study while not fasting using gender and khat use status. This resulted in 40 participants (12 female and 28 male; 25 khat users and 15 nonusers) in each fasting group. Cardiovascular (blood pressure and heart rate) and subjective measures were collected throughout the laboratory stress session. In addition, Self-report mood and withdrawal measures were collected multiple times during the ambulatory assessment. **Results:** Khat users reported greater negative affect than nonusers. Results from the ambulatory study indicated that withdrawal symptoms were lower during evening hours in the fasting group than in the no-fasting group. Results from the laboratory study showed that stress-related changes in positive and negative affect were flattened in the fasting group relative to the no-fasting group. Khat users reported reduced blood pressure responses relative to nonusers. **Conclusion:** Our results demonstrate that fasting is associated with reduced withdrawal symptoms among khat users. Khat use was related to blunted blood pressure stress response but this was independent of fasting. Future research should examine potential effectiveness of fasting in reducing substance use.

285) Abstract 1390

THE PREDICTIVE RELATIONSHIP BETWEEN HAIR CORTISOL, SOCIAL SUPPORT, AND RISK OF GESTATIONAL DIABETES IN PREGNANT MEXICAN AMERICAN WOMEN

Gladys Gonzalez-Matias, N/A, Kimberly D'Anna-Hernandez, PhD, Psychology, California State University, San Marcos, San Marcos, CA Gestational Diabetes Mellitus (GDM) is a risky condition during pregnancy associated with serious birth outcomes like reduced birth weight and early gestational age. Stress may contribute to the onset of GDM and previous work has suggested high levels of the stress-related hormone, cortisol, may deteriorate insulin resistance. Some populations may be more at risk of GDM due to their high levels of stress, such as the fast-growing Mexican-American population, especially as they spend more time in the United States. Mexicans experience high levels of sociocultural factors like acculturation, adaptation to U.S. culture that increases with more time in the U.S., but acculturation has not been examined fully. On the other hand, social support, a strong Mexican cultural value, has been shown to aid in GDM treatment compliance. Thus in this study we examined if cortisol and/or acculturation predicted GDM risk in pregnant Mexican American women and if social support could moderate this relationship. A total of 88 women were recruited from a local clinic between 10-15 weeks gestation. Medical records were reviewed for any indication of GDM risk or non-risk. Questionnaires were given to measure acculturation and perceived social support. In addition hair cortisol was collected and analyzed at the end of each trimester. Neither Cortisol ($p>.05$) nor acculturation were predictive of GDM risk ($B=0.661, S.E.=0.383, OR=1.937, p=0.085, 95\% CI: 0.914-4.107$). However, late in pregnancy, women with low cortisol levels and low social support, were more likely to have increased risk of GDM compared to those with high support ($b=0.0564, S.E.=0.0262, z=2.1520, p=0.031, 95\% CI: 0.0050-0.1077$). In addition, women with high cortisol levels and low task support, had a reduced probability of

GDM risk. This may suggest that social support during pregnancy may serve as a protective factor for women of Mexican descent with low cortisol against GDM. The combination of increased susceptibility of Mexican women to GDM diagnosis, along with the negative perinatal outcomes associated with GDM, make early recognition of GDM-risk essential for establishment of better preventative measures.

286) Abstract 1302

MOTIVATIONAL ORIENTATION MEDIATES THE ASSOCIATION BETWEEN DEPRESSION AND CARDIOVASCULAR REACTIVITY TO ACUTE PSYCHOLOGICAL STRESS

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Recent theoretical developments in cardiovascular reactivity research suggest the association between depression and blunted reactions to stress is linked to motivational factors. Thus, the present study aimed to test whether the associations between depressive symptoms and cardiovascular reactivity to acute stress was mediated by motivation; be it intrinsic or extrinsic motivation. One hundred and eighty-two healthy young adults completed measures of motivation (Global Motivation Scale [GMS]), and depression (Hospital Anxiety and Depression Scale [HADS]) and had their blood pressure and heart rate monitored throughout a standardized stress testing protocol. Results indicated that depression was negatively associated with both systolic blood pressure (SBP) and heart rate (HR) reactions to the stress task (all $ps < .05$), such that those who reported higher depressive symptomology displayed a blunted response. Further, it appeared that this relationship was mediated by intrinsic, but not extrinsic motivation; those with lower depressive symptoms were intrinsically motivated and had less pronounced physiological responses to the stressor. The present findings add extensively to existing research and suggest that motivation is an underlying mechanism linking depression and cardiovascular reactivity.

287) Abstract 1362

THE EFFECT OF MOTHER'S ETHNICITY AND THEIR FETAL ATTACHMENT'S EFFECT ON CORTISOL LEVEL'S PREGNANCY

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It has been found that high levels of cortisol lead to a variety of negative health outcomes such as cardiovascular disease, especially in ethnic minority women during pregnancy and this may in turn affect their baby's health causing complications such as, premature birth and developmental delays. Previous studies have examined how mother's cortisol levels and fetal attachment affects their baby's health outcomes, but not many have looked at how these variables may be affected by the mother's ethnicity and how this relates to their health outcomes. However, few studies have examined the relationship between mother's ethnicity and their cortisol (AUC, the total amount of cortisol exposure over the course of a day) moderated by their level of maternal fetal attachment (MFA, women's interaction with their unborn child) to their baby. Elevated cortisol and lower levels of maternal fetal attachment can provoke higher stress levels which may heighten the risk of birth complications. The current study examined whether Latina mothers (71%) would have lower levels of cortisol when compared to non-Latina mothers (18% African American, 4% Asian-American, 4% Non-Hispanic White, 3% Mixed Ethnicity) and whether their cortisol levels are influenced by their maternal fetal attachment. Our sample included low-income mothers ($N = 87$) who completed assessments regarding demographics and maternal fetal attachment at the third trimester. Additionally, women provided seven saliva samples in one day to assess for cortisol levels. A regression

analysis indicated that there was a significant interaction between ethnicity and maternal fetal attachment on cortisol, such that non-Latina mothers who reported higher levels of attachment with their fetus had lower cortisol levels ($b = 0.074$, $t(83) = -2.441$, $p = 0.017$). Results may be due to different perspectives and experiences of maternal stressors that affect maternal fetal attachment in Latina mothers. These findings support the idea that health behavior interventions can improve minority mother's well-being by lowering their AUC levels and increasing maternal fetal attachment with their baby. This also highlights the need for Latina mothers to take early prevention measures in order to reduce stress during pregnancy.

288) Abstract 1083

INDIVIDUALS WITH REPORTED CHILDHOOD EMOTIONAL TRAUMA DISPLAY BLUNTED HEART RATE RESPONSES TO STRESS

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Childhood abuse is highly prevalent and is associated with altered cardiovascular responses to stress. Previous research examining abuse and stress responses has been mixed, with some studies reporting history of abuse to be related to exaggerated responses and others demonstrating abuse is associated with blunted responses. No study to date has examined how abuse relates to cardiovascular responses with recurrent exposure to the same stressor. In the present study, we aimed to examine emotional abuse with cardiovascular stress responsivity patterns to recurrent stress exposures. Based on the results of recent studies, we hypothesized that individuals with a history of emotional abuse would have a pattern representative of blunted cardiovascular responsivity during stress. Participants ($N = 114$, 62.6% Caucasian, 18% Hispanic) completed the Childhood Trauma Questionnaire (CTQ) and standard cutoffs were used to group participants in categories: emotional abuse or no abuse. Participants then completed the following: a 10-minute baseline, a 4-minute mental arithmetic stress task, a 10-minute break, a 10-minute baseline, and a 4-minute mental arithmetic stress task. Heart rate was measured throughout the protocol and averages were created for each phase. Group (abuse, no abuse) \times Time (baseline, stress, baseline, stress) ANOVAs indicated a significant difference between the groups for heart rate throughout the protocol, $F(3, 336) = 5.58$, $p = .007$, $\eta^2 = .047$. Post-hoc analyses indicated there were no differences between groups during any of the baseline periods. However, during both stress exposures, the emotional abuse group had blunted responses to stress compared to the no abuse group. The current study suggests that there are differences in stressor-evoked physiological responses between individuals with a history of emotional abuse and those without a history of abuse. This is the first study to demonstrate these differences are stable across repeated exposure to the same stressor. Childhood abuse, specifically emotional abuse, has long-lasting health implications into adulthood. This has future implications about identifying those with a history of emotional abuse and addressing possible interventions. Research should investigate additional types of abuse, such as physical abuse or neglect, and their relationship with repeated exposures to stress.

289) Abstract 1057

SUBJECTIVE AND OBJECTIVE SOCIOECONOMIC STATUS AND STRESSOR-EVOKED HEART RATE RESPONSES

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Background

Subjective socioeconomic status (SSS) and objective socioeconomic status (OSS) are associated with a variety of health outcomes, some of which are related to stress. Research investigating the relationship between measures of socioeconomic status (SES) and health has produced conflicting results. Some studies have demonstrated that SSS was more predictive of health outcomes than OSS, whereas other studies found converse results or found that SSS and OSS differentially predicted health outcomes. Previous research has typically relied solely on surveys and medical records for health outcomes. There is a scarcity of studies that have explored how SSS and OSS relate to actual physiological responses to stress-inducing tasks.

Aim

To examine if subjective or objective measures of SES are more closely associated with stressor-evoked heart rate (HR) responses.

Methods

Undergraduate participants [N = 115, age, Mean = 19.65 SD = 0.80 years, 68.1% female, 64.7% Caucasian, 18.1% Hispanic] completed a standardized mental arithmetic acute stress task (Paced Auditory Serial Addition Test, PASAT), and HR was measured during a 10-minute baseline and the 4-minute PASAT. HR reactivity was calculated (task - baseline). Participants provided information concerning socioeconomic status, using the McArthur Ladder for SSS and parents' occupational status for OSS.

Results

Independent regression analyses indicated that OSS was negatively associated with HR reactivity ($\beta = -.264, p = .004$), as was SSS ($\beta = -.186, p = .046$). In a regression analysis with both OSS and SSS predicting HR reactivity, only OSS remained significant ($\beta = -.228, p = .030$), and SSS became non-significant ($p = .48$).

Conclusion

Higher levels of OSS were associated with lower HR reactivity to acute stress. SSS was also negatively associated with stressor-evoked HR reactivity. However, OSS was a stronger predictor of lower HR reactivity compared to SSS and may be indicative of future health outcomes such as cardiovascular disease. The relation between stressor-evoked HR responses and OSS could provide a mechanism by which OSS can predict future health outcomes. Future research should aim to explore other biological systems that could explain a possible mechanism between OSS and health outcomes (i.e. inflammatory system, cardiovascular system).

290) Abstract 1157

EXPERIMENTALLY INCREASING LEVELS OF GRATITUDE IMMEDIATELY PRIOR TO ACUTE PSYCHOLOGICAL STRESS EXPOSURE: IMPACTS ON ANXIETY, PERFORMANCE, AND CARDIOVASCULAR STRESS REACTIVITY

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Background: Gratitude is appreciating the meaningful actions that resulted from another. Gratitude interventions have been shown to reduce cardiovascular markers in patient populations. However, the exact mechanisms behind these relationships remain unclear. One possible mechanism could be through reductions in stressor-evoked anxiety and/or cardiovascular reactivity (CVR).

Aim: To examine the effects of experimentally induced gratitude on: 1) CVR and psychological responses to an acute stress task (Paced Auditory Serial Addition Test, PASAT) and 2) performance on the PASAT.

Methods: Undergraduate participants (N = 144, Mean age (SD) = 19.03 (1.01) years; 79% female; 57% Caucasian) were randomized into one of three conditions (positive affect, gratitude, and control), and completed a two-round resource distribution task followed by the PASAT. In the distribution task, either the partner or 'random chance'

provided the participant with resources. The positive affect condition was randomly allocated resources, the gratitude condition was told a participant gave them their resources, and the control condition received no resources. Heart rate and blood pressure were measured every two minutes during a 10-minute baseline period and 4-minute PASAT. CVR was calculated as average stress - average baseline. Participants reported levels of cognitive task anxiety prior to completing the PASAT.

Results: No significant differences were found between the three groups for CVR ($p > .05$), cognitive task anxiety ($p > .05$), or PASAT performance ($p > .05$). Separate analyses examining each group indicated that for participants in the gratitude condition only, greater levels of state gratitude toward the other participant was related to worse task performance ($r = -.33, p = .025$) and increased cognitive task anxiety ($r = .36, p = .014$).

Discussion: Inducing state gratitude did not produce differences in cardiovascular, anxiety, or performance measures between the groups. These results may be due to the nature of the stress task, which involves substantial cognitive effort, and may not have allowed participants to sustain gratitude levels throughout the stress portion of the protocol. Within the gratitude condition, higher gratitude was related to worse anxiety and performance outcomes, suggesting gratitude may not always be beneficial.

291) Abstract 1830

RACIAL DIFFERENCES IN CHILDHOOD ADVERSITY AND ITS CONTRIBUTION TO EPINEPHRINE AND NOREPINEPHRINE

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Childhood adversity has been shown to have a substantial influence on health across the life-span, predicting earlier onset of disease (Bann et al., 2015). Urinary catecholamines (epinephrine and norepinephrine), markers of sympathetic nervous system functioning, have been associated with psychological stress exposure (Miller et al., 2011). Epinephrine has been shown to rise in response to mental demands, whereas norepinephrine increases in the event of physical demands (Lundberg, 1984). Importantly, the link between childhood adversity and catecholamine levels has been explored in adult samples, but not widely among adolescents (Castro-Diehl et al., 2014). The current study addresses this knowledge gap by examining the association between childhood adversity and subjective stress in relation to catecholamines in African American and White American adolescents. Measures of norepinephrine and epinephrine were obtained on 12-h overnight urine specimens from 149 participants ($M_{age} = 18.8$ years, $SD = 1.0$ years, 56% female, 46% African American). Childhood adversity was assessed using a 21-item inventory ($\alpha = .81$), with items about adverse experiences before age 18. Initial models were estimated to examine associations between childhood adversity and urinary hormones, controlling for demographics. A second model examined differences by race. A final model included potential social/behavioral mediators.

Greater exposure to childhood adversity was associated with higher levels of norepinephrine ($B = .74, SE = .23, p < .001$). This association was found to vary by race ($B = -.96, SE = .43, p = .03$), such that it was stronger for White Americans ($B = 1.33, SE = .35, p < .001$) than for African Americans ($B = .37, SE = .28, p = .19$). Childhood adversity was not significantly associated with epinephrine overall ($B = .08, SE = .05, p = .14$). However, a significant childhood adversity by race interaction effect was present ($B = .22, SE = .10, p = .02$), indicating an association with epinephrine among African Americans ($B = .16, SE = .06, p = .01$), but not White Americans ($B = -.06, SE = .08, p = .45$). Further adjustment for covariates did not alter the estimates between childhood adversity and catecholamines. These findings suggest a differential stress response in African Americans

and White Americans, highlighting the importance of race in shaping biological outcomes.

Figure 1. Plot depicting the association between childhood adversity and norepinephrine for White (n=81) and African American (n=68) college students.

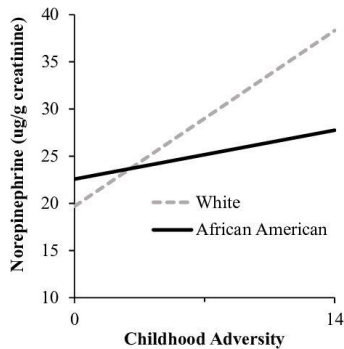
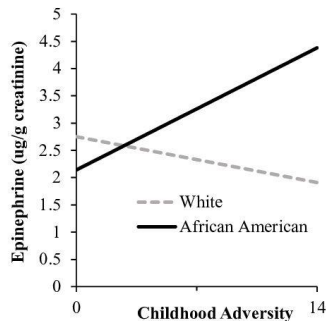


Figure 2. Plot depicting the association between childhood adversity and epinephrine for White (n=81) and African American (n=68) college students.



292) Abstract 1476

SOCIAL BEHAVIOR AS A PREDICTOR OF IMMUNITY IN PINE SAWFLIES

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Social behavior has been conserved over time in some species because it is beneficial for group survival. As a result, individuals in social-living groups who interact frequently with conspecifics demonstrate better immune response. In humans, for example, sociability is associated with better immunity, whereas loneliness is associated with worse immunity. This study aims to determine if immune response is influenced by social behavior and group size in pine sawfly larvae. Some species of sawfly larvae are aggregative in nature (i.e., they naturally live and feed in close proximity with each other), while others are isolated (see Figure). By exposing different species to different group sizes, it should be possible to determine if aggregative nature and social group size jointly predict immune response. The sample consists of three species which vary in aggregative tendency: *N. lecontei*, *N. virginianus*, and *D. similis* (high, medium, and low aggregative tendency, respectively). Individuals were split into treatment groups two weeks after hatching, when they have consistent survival. Five colonies of each species will be exposed to 3 different group sizes: small (n = 3), medium (n = 12), and large (n = 25). Immune samples were collected from 3 individuals in each treatment group (n = 9). Immune function will be tested one week after group assignment, based on the amount of melanin coated on a foreign object inserted into the body cavity of the larvae. Statistical analysis will consist of 2-way (species x group size) ANOVA, followed by simple main effects of group size within species. We predict that the most social species should demonstrate the best overall immunity, but this

species should also demonstrate the largest decrease in immune function when exposed to small group size.



293) Abstract 1795

CARDIAC AUTONOMIC BALANCE AND REGULATION ARE RELATED TO BOTH DIFFICULTIES IN EMOTION REGULATION AND RUMINATION: EVIDENCE OF SEX DIFFERENCES

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Cardiac autonomic balance (CAB) is defined as the relative balance between cardiac sympathetic (SNS) and parasympathetic (PNS) activity, while cardiac autonomic regulation (CAR) is defined as the total activity of both nervous systems. It is theorized that greater difficulties in emotion regulation (DER) and maladaptive emotion regulation strategies are associated with poorer health via poorer resting cardiac activity. However, few studies have linked resting CAB and CAR with self-report measures of DER and associated maladaptive regulation strategies, such as rumination. Our recent work reported preliminary associations between both CAB and CAR and DER, such that lower CAB, but not CAR, was associated with greater DER. Moreover, recent evidence suggests sex differences in the relation between resting cardiac activity and DER. Therefore, the current study expands on our prior association between DER and both CAB and CAR in a larger sample of individuals. Additionally, we sought to examine the direct association between rumination and both CAB and CAR; all associations were examined split by sex. Resting-baseline cardiac data was collected from 173 undergraduates (120 women, mean age = 19.15). Participants later completed the DER Scale and the Rumination Response Scale. Pre-ejection periods (measure of SNS activation) and root mean square of successive differences (measure of PNS activation) were used to derive indices of CAB and CAR. Controlling for age, ethnicity, and BMI, correlation results revealed poorer (lower) CAB was associated with greater DER ($r = -.165$, $p = .036$) and rumination ($r = -.154$, $p = .05$). Lower CAR was related to greater DER ($r = -.279$, $p < .001$) and rumination ($r = -.158$, $p = .044$). Split by sex, CAB and CAR were inversely related to

DER in women (CAB: $r = -.204$, $p = .032$; CAR: $r = -.316$, $p = .001$), but not men (CAB: $r = -.160$, $p = .271$; CAR: $r = -.169$, $p = .247$). No sex differences were observed between rumination and both CAB and CAR. Overall, these data support theories that poorer CAB is related to DER and maladaptive emotion regulation strategies such as rumination. Novel evidence suggests a potential stronger association with CAR compared to CAB; co-inhibition of the SNS and PNS may be particularly linked with DER and rumination, especially in women. The specific role of the PNS, in addition to future directions, will be discussed.

294) Abstract 1429

SELF-REPORTED STRESS VERSUS BIOLOGICAL MARKERS: A META-ANALYSIS ON THE ASSOCIATIONS BETWEEN MINIMALLY INVASIVE MEASURES OF STRESS

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Stress is a key social determinant of health, and many researchers are interested in measuring biological mechanisms related to stress. Using minimally-invasive collection methods to collect biological specimens may improve participation of underrepresented populations in research, but it is unclear if biological markers measured in these ways are associated with self-reported stress. To examine this, we used meta-analytic techniques to test the associations between two self-report measures of stress (i.e., Perceived Stress Scale-14 [PSS-14], Trier Inventory for Chronic Stress [TICS]) and commonly-used biological markers of hypothalamic-pituitary-adrenal (HPA) axis dysfunction (i.e., salivary cortisol, hair cortisol).

PubMed, PsycINFO, and Scopus were searched for papers that included either the PSS-14 or TICS and measures of salivary or hair cortisol. 52 papers met inclusion criteria. Only a subset had the necessary data available for meta-analyses; we have contacted authors of other papers to request data for further analysis.

Preliminary random effects meta-analyses were conducted using available data. Results indicated that self-reported stress, as measured by the PSS-14, was not significantly associated with levels of salivary cortisol ($Z = -.028$; 95% CI, -0.50 - 0.43 ; $n=5$) or hair cortisol ($Z = 0.09$; 95% CI, -0.36 - 0.53 ; $n=6$). When self-reported stress was measured using TICS, there was still no significant association with levels of salivary cortisol ($Z = 1.84$; 95% CI, -0.19 - 0.50 ; $n=4$). Meta-analysis could not be conducted for TICS and hair cortisol ($n=1$).

Contrary to expectations, we did not find meta-analytic evidence for an association between self-reports of perceived stress and biological markers of HPA-axis activation. A number of methodological differences across studies may contribute to variability in the effect size of associations between self-reported stress and “biomarkers” of stress like salivary and hair cortisol; follow-up meta-regression analyses will explore these. These results suggest that caution is warranted when interpreting biological measures, and that they should not be used as replacements for self-report measures of perceived stress. Both types of data may provide key information but they are not synonymous.

295) Abstract 1506

TASK ORDER EFFECTS ON CARDIOVASCULAR REACTIVITY AND BEHAVIOR

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This study is a secondary analysis from a larger study examining the influence of empathy on cardiovascular reactivity during two dyadic interaction tasks. Thirty-two female undergraduates completed a neutral task in which they were instructed to convince a confederate to

attend a particular university, as well as a comfort task in which they were instructed to comfort a confederate in distress. Task order was counterbalanced across participants, and the purpose of this secondary analysis was to examine whether the order in which participants experienced the two tasks influenced cardiovascular reactivity and behavioral measures during pre-task rest periods and during active task periods.

During pre-task rest periods, results indicated that for only those who completed the comfort task first, there was a significant main effect of Task Type, $F(1, 15) = 6.09$, $p < .05$, $\eta^2 = .29$, such that DBP levels were higher during the pre-neutral rest period as compared to the pre-comfort rest period. Additionally, for those who completed the comfort task first, there was a significant main effect of Task Type, $F(1, 15) = 4.59$, $p < .05$, $\eta^2 = .23$, such that measures of HF-HRV were higher during the pre-comfort rest period as compared to the pre-neutral rest period. These findings indicate that participants were still exhibiting residual arousal from the comfort task during the pre-neutral rest period. Regarding task period effects, results revealed a significant difference in HR reactivity between Task Orders during the neutral task, $F(1, 29) = 4.27$, $p < .05$, $\eta^2 = .13$. HR reactions were higher during the neutral task than in the comfort task, but only when the neutral task was presented first. Regarding behavioral measures, there was a significant Order X Task Type interaction only on number of words spoken, $F(1, 30) = 7.85$, $p < .01$, $\eta^2 = .207$. For both orders, more words were spoken during the neutral task, though this difference was more prominent for those who completed the comfort task first. These results emphasize the importance of implementing measures to account for order effects in studies examining cardiovascular reactivity and behavioral outcomes to dyadic interactions, as well as the fact that interesting order effects occur even when controlling for them via counterbalancing.

296) Abstract 1378

BIDIRECTIONAL ASSOCIATIONS BETWEEN DAILY STRESS TRAJECTORIES AND SLEEP IN A COMMUNITY SAMPLE

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Introduction: Previous literature demonstrates the association between psychosocial stressors and poor or disturbed sleep. Experimental studies suggest that 1) sleep deprivation increases vulnerability to acute psychosocial stressors, and that 2) experimentally induced stress results in changes to various sleep parameters such as sleep efficiency and number of nighttime awakenings. However, few studies have examined the ecological validity of these acute experimental effects. Of studies that have used methods such as ecological momentary assessment (EMA) to examine the effect of daily stressors on sleep, sampling was either infrequent (<twice a day), or homogenous samples were used. Likewise, few have examined the bidirectional nature of the sleep and stress relationship in a single sample. In the current study, we wish to examine the bidirectional temporal relations between daily stress responses and objective/subjective sleep parameters in a diverse community sample. **Method:** Participants were 300 healthy community adults (150 men, 150 women) ages 21 to 70 years ($M = 42.4$ [$SD = 12.8$]) enrolled in the North Texas Heart Study. EMA surveys were used to assess daily experiences of stress over a 48-hour period at random during 45-minute intervals. Sleep was measured using both actigraph monitors and sleep diaries over the same 48-hour time period.

Analyses: Our measures of sleep and stress are on different time scales (sleep is measured once a day, and stress is measured approximately every 45 minutes throughout the day). Thus, we will collapse stress to examine the relationship of both mean and variability (standard deviation) of stress with objective and subjective sleep parameters (i.e., total sleep time [SD] and sleep efficiency [SE]) across 2 days. Using multilevel modeling, we will then determine the lagged relationship of sleep on the next day's daily stress trajectory. If SE relationships are found, exploratory analyses will ascertain whether components of SE (i.e., wake after sleep onset, sleep onset latency, and nighttime awakenings) demonstrate a similar pattern of results.

297) Abstract 1572

SHORT SLEEP AND NEGATIVE HEALTH BEHAVIORS: A COMPOUNDING EFFECT ON CARDIOVASCULAR REACTIVITY

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Short sleep is associated with increased cardiovascular reactivity (CVR) to stress, a potential risk factor for cardiovascular disease (CVD). In addition to being associated with CVR, research suggests that short sleep may aggregate with other negative health behaviors such as poor diet, smoking and low physical activity. Little is known about the accumulation of these behaviors and their resulting effect on cardiovascular responses to stress. To investigate these relationships, we evaluated data from a diverse sample of community-dwelling participants (N= 213; Mage = 30.1(SD=10.9); 58% Male; 27% African American) from Pittsburgh, Pennsylvania. To understand how short sleep may aggregate with negative health behaviors we examined sleep duration and self-reported health behaviors assessed via daily diary and averaged across 14 days (e.g. fruit and vegetable consumption, physical activity, smoking, and alcohol use). To test associations with CVR, participants completed the Trier Social Stress Task (TSST). First, a latent class analysis was performed, resulting in a two-class solution: (1) short sleep duration, higher alcohol and cigarette use, and lower physical activity, fruit, and vegetable consumption; (2) longer sleep duration, lower alcohol and cigarette use, and higher physical activity, fruit and vegetable consumption. Then, we examined whether these two groups showed differences in CVR. Compared to the normative sleep class, the short sleep latent class was associated with greater CVR during the speech task [*SBP* ($b=8.109, p=.000$), *DBP* ($b=2.479, p=.019$), and *HR* ($b=4.100, p=.004$)]. Additionally, the short sleep latent class was associated with greater increases in *SBP* during speech preparation ($b=3.892, p=.004$) and the arithmetic task ($b=7.861, p=.000$). There was no difference in blood pressure or heart rate during recovery based on classification group. These findings are important because they suggest that short sleep and its associated negative health behaviors have compounding effects on CVR, but they also show that the system can recover over time. Understanding how these behaviors work together to influence the cardiovascular system is vital for developing future prevention strategies for CVD and other adverse health outcomes.

298) Abstract 1651

SNOO: A WELLNESS DEVICE TO IMPROVE INFANT SLEEP

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Childbirth results in significant sleep impairment, including sleep deprivation and reduced sleep satisfaction. Sleep deprivation is strongly linked to myriad health impairments, including depression. One of the primary contributors to new parent sleep deprivation is infant sleep disturbances. Evidence shows that reducing crying and increasing sleep in infants has a positive effect on parental psychological distress and sleep. SNOO, a wellness device, was developed to provide sleeping babies 3 of the 5 S's (safe swaddling,

sound and swinging) in a response fashion (increasing levels of motion and white noise if babies cry) to soothe crying and improve infant sleep. The current study compares infant sleep derived from SNOO to a reference group derived from a compilation of 13 peer reviewed studies of normative sleep data from traditional cribs/bassinets. Following purchase, participants were informed that data about the infant's sleep would be collected by SNOO via use of the mobile app by Happiest Baby. Inclusion criteria included initiation of use within one week of birth and use of SNOO for at least 6 hours per night for 6 months. Sleep metrics calculated on a day to day basis include *Longest Sleep Period*: Maximum uninterrupted sleep at night (7 PM – 7 AM); *Total Sleep Duration*: Total time spent sleeping at night (7 PM – 7 AM); and *Night Awakenings*: Number of times parents attended to the baby (10 PM – 6 AM). Improvement in longest sleep duration varied with age. Preliminary data from 7157 babies using SNOO indicate that infant's longest episode of sleep over the first 6 months of life was increased by 42 minutes - 2 hour 0 minutes and total sleep duration was increased by 33 minutes – 1 hour 24 minutes. Babies in SNOO averaged one less waking per night compared to the reference population. The improvements in all three sleep metrics were statistically significant with p 's < 0.0005 across all ages from birth to 6 months. In summary, this large-scale study suggests that infant sleep can be significantly improved by using SNOO compared to babies who slept in normal cribs or bassinets. We believe that there are myriad areas of public health that may be positively impacted as a result of this significant level of improvement of infant sleep.

299) Abstract 1680

ETHNICITY IS ASSOCIATED WITH DIFFERENCES IN STRESS RESPONSE

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Sleep disturbances are widely prevalent and are associated with compromised physical and psychological well-being. Poor sleep may contribute to poor health by disrupting autonomic systems that regulate response to stressors, and the effects of sleep on health outcomes are especially relevant in Latinos, who sleep significantly less than Whites. Latinos are the largest growing minority in the U.S., with Mexicans composing the largest group, yet there is little demographic representation of Mexican-Americans in the sleep literature. The overall goal of this study was to examine ethnic differences between Mexican-Americans and Whites in the associations between sleep and autonomic stress physiology. Participants included 117 undergraduate students ($M_{age} = 20$ years, Age range = 18-24, 77% female, 53% Mexican-American, 47% White). Sleep was measured using daily diaries for 10 consecutive days, after which participants completed the Trier Social Stress Task (TSST). Sleep duration, quality, efficiency, and variability in sleep duration were used to predict heart rate and heart rate variability during rest, stress, and recovery from the TSST. Regression analysis results indicate that White participants were more likely to experience an increase in heart rate during stressor, $F(1, 114) = 5.19, p = 0.02, R^2 = .04$, and more likely to recover faster from the stressor, $F(1, 113) = 7.11, p = 0.009, R^2 = .06$, than Mexican American participants. The main effects of sleep duration, quality, efficiency, and variability were not significant, nor were there interaction effects of ethnicity by sleep, on heart rate variability during rest, stress, or recovery. This study serves as preliminary evidence for possible differences in stress response between Mexican-Americans and Whites. More research is needed to identify how ethnicity contributes to differences in stress response and the possible health risks associated with these differences.

300) Abstract 1609

DOES INTERPRETATION BIAS MODERATE THE LINK BETWEEN MICROAGGRESSIONS AND HRV IN LATINXS?

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BACKGROUND: Microaggressions — a covert form of racism involving slights about one's ethnicity—can be a chronic stressor for minorities. Latinxs are highly vulnerable due to increasingly negative rhetoric in the U.S. One factor that may impact the effects of microaggressions on health is interpretation of threat in ambiguous situations. Threat interpretation bias has been associated with psychopathology (e.g., anxiety) and aberrant autonomic functioning. The present study examined whether interpretation bias moderated the relationship between perceptions of microaggressions and aberrant autonomic functioning in Latinx emerging adults. We hypothesized that those with higher self-reported emotional sensitivity towards microaggressions and higher interpretation bias towards threat would experience low resting heart rate variability (HRV). **METHOD:** N=34 Latinx emerging adults (age 18-23 yrs; $M = 18.82$, $SD = 1.40$) were recruited from a larger cross-sectional study. Emotional sensitivity to microaggressions was assessed with the 12-item self-report Ethnic Microaggression scale (Hyunh, 2012). Threat interpretation bias was assessed with a performance-based computerized measure (word-sentence paradigm; Rozenman et al., 2011). An interpretation bias index was calculated by subtracting mean threat rejection reaction times (RTs) from mean threat endorsement RTs toward threat- and neutral-valenced stimuli. Finally, HRV was collected using electrocardiogram equipment. Hypotheses were tested with a hierarchical regression. **RESULTS:** There were no significant main effects for interpretation bias ($p = 0.26$) or microaggression sensitivity ($p = 0.73$) on resting HRV for Latinx emerging adults. Interpretation bias did not significantly moderate the association between microaggression sensitivity and HRV, $F(3, 30) = 0.60$, $p = .62$, $\Delta R^2 = .007$. Interestingly, only 11% of participants reported being upset (high sensitivity) after experiencing a perceived microaggression. **DISCUSSION:** Little is known about microaggressions and their effect on ethnic minority health, particularly Latinx health. Unexpectedly, few participants reported being upset by the microaggressions; possibly due to the ambiguity of microaggressions. Other factors that were not analyzed, like coping or emotion regulation, may be affecting the relationship. Study limitations and future directions will be discussed.

301) Abstract 1718

THE ROLE OF RELIGIOUSNESS AND SPIRITUALITY IN POST-POLIO RELATED HEALTH OUTCOMES

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Objective. Poliovirus caused worldwide epidemics in the 20th century. Currently, polio is eradicated in all but three countries worldwide. However, post-polio syndrome (PPS) affects polio survivors and is considered a secondary disability. Individuals affected by PPS experience new symptoms similar to those of polio that include muscle weakness, fatigue, joint degeneration, and pain. Additionally, they experience multiple psychological detriments including anxiety and depression.

Substantial research indicates that religiousness and spirituality are related to better health. We were interested in whether polio survivors or PPS affected individuals who are more religious/spiritual would have better health outcomes. In our literature review, we considered relationships of disability and polio/PPS, religiousness/spirituality and disability, and religiousness/spirituality and polio/PPS and identified

no previous studies on religiousness/spirituality and polio or postpolio. Thus, the present study set out to evaluate this relationship.

Methods. We conducted an analysis of data collected via interview and questionnaire from 189 post-polio patients. Participants completed measures of polio history, late effects of polio (PPS symptoms), general physical functioning and health, mental health, and psychosocial resources including religiousness and spirituality at one timepoint.

Results. Aspects of religiousness and spirituality were beneficially associated with mental health, particularly depression. Participants higher in religiousness and spirituality had lower scores on depression. However, religiousness and spirituality were inversely associated with general physical health as well as PPS symptoms and function.

Discussion. Previous literature on religiousness and health in healthy populations would suggest that post-polio patients who are more religious and/or spiritual would enjoy better health. This was the case for mental health in our study. However, the relationship between physical health and religiousness/spirituality was unexpected. It is possible that individuals with worse PPS symptoms utilize coping strategies that involve religious and spiritual behaviors. Religiousness/spirituality might offer some help to mental health but might, more accurately, index severity of physical disease state.

302) Abstract 1223

A NOVEL MEASURE OF SELF-REPORTED INTEROCEPTION: THE THREE-DIMENSIONAL INTEROCEPTIVE SENSATIONS QUESTIONNAIRE

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Interoception refers to the ability to perceive internal bodily sensations such as breathing, heartbeats, and the movement of the viscera. This multidimensional construct can be measured using both performance-based methods (e.g., heartbeat counting task) and self-report. Surprisingly, research so far has failed to show strong associations between different measures of interoception. This could be caused by the choice of self-report measures, which often use different operationalizations of interoception and frequently include both non-neutral sensations (e.g., responses to affective states or somatic symptoms) and neutral bodily sensations in different organ systems. To overcome those limitations, we propose a novel measure of interoception, the Three-dimensional Interoceptive Sensations Questionnaire (ThIS-Q), which focuses on the perception of neutral sensations in three domains: respiratory, cardiac, and upper gastrointestinal. In Study 1, a pool of 28 items was presented to a sample of 357 undergraduate students. Exploratory factor analysis with oblique factor rotation performed on this dataset suggested a 3-factor solution with the following interpretation of factors: cardiorespiratory activation, cardiorespiratory deactivation, and gastroesophageal. Items with a primary factor loading $>.40$ were retained for confirmatory factor analysis which was performed in Study 2 in a sample of 374 adults recruited through Prolific Academic. The analyses supported the 3-factor solution of the 21-item ThIS-Q. All subscale and composite scores had acceptable to good internal consistency reliability. We have also examined construct validity, showing that ThIS-Q scores were positively related to other general measures of interoception, including the Body Awareness Questionnaire. Divergent validity was supported with nonsignificant associations with measures of negative affectivity, anxiety, worry, and symptom-related fear. Taken together, our findings suggest that the ThIS-Q is a valid and reliable measure of interoceptive sensibility. It consists of three scales assessing self-reported perception of neutral sensations from the cardiac, respiratory, and gastroesophageal system.

This questionnaire could advance our understanding of interoceptive processes by allowing for the measurement of interoception within as well as between different bodily domains.

303) Abstract 1518

THE BETWEEN- AND WITHIN-PERSON EFFECTS OF TESTOSTERONE ON COGNITIVE PERFORMANCE IN THE MENOPAUSE TRANSITION

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Background: As many as 50% of women report cognitive problems in the years leading up to menopause, otherwise known as the menopause transition (or 'perimenopause'). A small body of research has pointed toward the involvement of testosterone (T) in supporting perimenopausal cognitive abilities but this remains to be replicated. The current study examined the within- and between-person effects of T on cognitive performance in perimenopausal women.

Methods: Participants (n = 43) were perimenopausal women, ages 45-55 years. Once every three weeks across a 12-week period, participants provided a urine sample for the measurement of T and underwent the Repeatable Battery for the Assessment of Neuropsychological Status Update (RBANS), which includes modules assessing immediate and delayed memory, attention, visuospatial abilities, language and executive function. Multilevel modeling was used to examine within-person effects of weekly person-centered T while regression analyses tested the effect of mean T on mean cognitive outcomes across the four testing sessions.

Results: Person-centered T levels were significantly positively associated with the RBANS Language Index score ($\beta(SE) = .037 (.003), p < .05$). Examination of subtests revealed that this effect was largely driven by a significant effect of T on the RBANS Semantic Fluency score ($\beta(SE) = .062 (.004), p < .05$), rather than on the RBANS Picture Naming score ($p > .05$). Furthermore, the effect of weekly T on the Language Index appeared to be greater among women below the median of mean T ($\beta(SE) = .74 (.006), p < .05$) than among women above the median ($p > .05$). Neither the within-, nor the between-person effect of T was significant in relation to immediate and delayed memory, attention, visuospatial abilities, or executive function.

Discussion: Findings highlight the role of T in predicting perimenopausal language abilities, particularly in late perimenopausal women, and also point to potential treatment options, including hormonal therapy, for women suffering from bothersome cognitive difficulties.

304) Abstract 1282

ACCESSING RESOURCES TO COPE WITH PAIN: EXPLORING THE NEED FOR A ONE-TIME ART AND PSYCHOTHERAPY INTERVENTION

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Chronic pain, which persists 3-6 months after expected recovery time, affects 11-40% of the U.S. population and is associated with opioid abuse, which has shown to be amendable to psychosocial intervention (Centers for Disease Control and Prevention, 2018). Women, ethnic minority groups, less-educated, and individuals working less than full-time have been shown to be more at risk for chronic pain (Mazer, 2018). Protective factors for chronic pain include hope, curiosity, gratitude, optimism, and social support. Psychosocial risk factors that may exacerbate pain include grief, trauma, depression, worry, anxiety, fear, anger, fatigue, suicidality, and social isolation. This poster session will review the psychosocial risk and protective factors for chronic pain and a current art-based treatment study that is based on published

empirical research of a four-drawing trauma and resiliency protocol. The four-drawing protocol asked participants to draw the problem, themselves, their internal and external resources, and how they see themselves after drawing their resources. Findings from this research showed the potential efficacy of the four-drawing protocol for decreasing pain ratings, negative affect, and increasing access to protective resources for female participants (Hass-Cohen, Bokoch, Clyde Findlay, & Banford Witting, 2018). The four-drawing protocol has been adapted to create the current three-drawing protocol, which guides participants to draw their problem, their internal and external resources, and their problem as they see it now. This poster will describe the proposed three-drawing protocol study, which will explore its effectiveness of reducing chronic pain and improving resiliency. In accordance with memory reconsolidation theory, it is expected that accessing protective resources may positively update the participant's experience and perception of psychosocial factors that may influence their pain.

305) Abstract 1687

PSYCHOLOGICAL COPING STRATEGIES, MOOD, AND CHANCES OF CONCEIVING IN WOMEN STRUGGLING WITH INFERTILITY

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Background: As many as 30-40% women struggling with infertility experience clinical anxiety and depression. The current online study examined the use of psychological coping strategies across the menstrual cycle in relation to within-person changes in depressed and anxious mood and chances of conceiving.

Methods: 65 North American women (19-43 years) trying to conceive naturally for ≥ 12 months were recruited via social media. On the first day of each participant's menstrual period, and every three days until the end of their cycle, participants completed the Immediate Mood Scaler-12 (IMS-12) for the assessment of depressed and anxious mood and a 15-item coping questionnaire developed by our group assessing four general coping strategies: suppression of negative emotions, active coping, engagement in activities unrelated to conception attempts (e.g. social, spiritual), and downplaying the importance of having biological children. The within-person effect of daily coping strategies on person-centered mood was examined; furthermore, coping strategies and mood across the cycle were examined in relation to pregnancy outcomes.

Results: 10 women became pregnant during the cycle in question. Daily behavioural engagement was associated with less depressed and anxious mood ($\beta(SE) = -3.0(0.5) \text{ \& } -2.0(0.4), p < .0001$). Conversely, downplaying the importance of conceiving was associated with more depressed and anxious mood ($\beta(SE) = 0.7(0.3) \text{ \& } 1.3(0.5), p = .044 \text{ \& } p < .010$). Significant predictors of pregnancy outcomes included the following: mean behavioural engagement across the cycle ($OR(95\% CI) = 6.7(1.3-34.6), p = .023$), emotional suppression ($OR(95\% CI) = 0.1(0.0-0.8), p = .032$), mean depression ($OR(95\% CI) = 0.8(0.7-1.0), p = .020$) and mean anxiety ($OR(95\% CI) = 0.7(0.6-1.0), p = .024$). These effects remained significant despite statistically adjusting for many potential confounders, including age, past fertility treatments, and number of past pregnancies.

Discussion: Psychological coping that focuses on engaging in behaviours unrelated to conceiving may be associated with improved mood, potentially translating into improved chances of conceiving, among women struggling with infertility. The potential mediating role of stress hormones is worthy of investigation. Caution is warranted, however, given the small sample size and observational nature of this study.

306) Abstract 1154 will not be published

307) Abstract 1523

PSYCHOMETRIC PROPERTY OF JAPANESE VERSION OF FAMILY COPING QUESTIONNAIRE FOR EATING DISORDERS

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Caregivers for a family member with an eating disorder are important for treatment. The Family coping Questionnaire for Eating Disorders (FCQ-ED) was originally developed in Italy to assess the coping strategies of caregivers for eating disorder patients, and consists of five subscales (Int J Eat Dis 2015). The purpose of the present study was to develop a Japanese version of the FCQ-ED and evaluate its reliability and validity. First, caregivers for eating disorder patients completed the Japanese version of the FCQ-ED and the Profile of Mood States (POMS). Next, the reliability and concurrent validity of the Japanese version of the FCQ-ED were assessed, but the Cronbach's alphas were low (ranging between 0.66 and 0.45) for the original five subscales of the FCQ-ED. Therefore, an exploratory factor analysis, then, Spearman's correlations were calculated between the FCQ-ED and POMS and between body mass index of patients and the FCQ-ED of caregivers, and Mann-Whitney U-test were performed to compare each item between mothers and fathers. The subjects consisted of 150 caregivers (91 mothers, 34 fathers, and 25 others). The mean age was 51.1 ± 12.0 years. The results showed that the 23-item scale consisted of 4 factors ("Coping with checking body weight," "Coping with binge eating and efforts to prevent bad relationship," "Patience," and "Coping with purging behavior") with Cronbach's alphas ranging between 0.85 and 0.68. Concurrent validity analyses revealed significant correlations between the following subscales ($p < 0.05$): "Coping with checking body weight" and POMS tension-anxiety; "Coping with binge eating and efforts to prevent bad relationship" and POMS tension-anxiety, depression, anger-hostility, and confusion; "Patience" and all subscales of the POMS; "Coping with purging behavior" and POMS depression, anger-hostility, and fatigue. An item of "being patient" was significantly lower in father than mother ($p < 0.05$). Body Mass Index of patients positively correlated with "Coping with binge eating and efforts to prevent bad relationship," and negatively correlated with "Patience". The Japanese version of the FCQ has a different underlying factor structure from the Italian version of the FCQ. Further research is necessary to investigate the usefulness of the FCQ in assessing the psychological support for family caregivers of eating disorder patients.

308) Abstract 1006 will not be published

309) Abstract 1892

PSYCHOPHYSIOLOGICAL PROFILE OF INCREASED AND DECREASED CLUSTERS IN THE NEUROENDOCRINE RESPONSE TO COLORECTAL DISTENTION

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Background: A wide range of inter-individual variation of hypothalamic-pituitary-adrenal (HPA) axis activity is observed in healthy individuals and stress-related diseases. However, the physiological and psychological mechanisms explaining this variation are poorly understood. We tested the hypotheses that HPA axis responses to colorectal distention affect HPA axis reactivity to corticotropin-releasing hormone (CRH), visceral pain threshold, and perceived stress.

Methods: We examined 58 subjects: 31 healthy volunteers (HVs) and 27 subjects with irritable bowel syndrome (IBS) (male/female 31/29, mean age \pm SD, 21.0 ± 2.7 years). Plasma adrenocorticotrophic hormone (ACTH) and serum cortisol were measured before and after colorectal distention to determine the visceral pain threshold, and before and at 15, 30, 60, and 120 min after CRH administration (intravenous; $2 \mu\text{g/kg}$). Subjects completed psychological questionnaires and rated subjective feelings during the experiment.

Results: According to the ACTH response to colorectal distention, the subjects were classified into 3 groups: flattened ($n = 38$), decreased ($n = 14$), and increased ($n = 6$). There were no significant differences in the HV/IBS ratio among the groups. We found significant differences in abdominal pain threshold ($p < 0.01$), discomfort threshold ($p < 0.05$), and sensitivity to anxiety ($p < 0.05$) among the groups. There were significant differences in ACTH change and peak level following CRH administration among the groups ($p < 0.05$) but not in cortisol change. However, the area under the curve of the cortisol response to CRH was significantly different among the groups ($p < 0.05$). The increased group showed a higher basal ACTH level ($p < 0.01$), earlier peak level following CRH administration ($p < 0.05$), and higher stress rating during the experiment ($p < 0.01$). On the other hand, decreased group showed a higher sensitivity to anxiety ($p < 0.05$) as a trait and enhanced subjective stress at baseline ($p < 0.05$).

Conclusion: The increased group had an exaggerated psychological and physiological stress response, while the decreased group had strong stress and an anticipatory endocrine response. Studies of the HPA axis need to consider the influence of psychophysiological factors.

310) Abstract 1622

DEVELOPMENT OF JAPANESE VERSION OF BODY CHECKING QUESTIONNAIRE (BCQ-J) AND ITS ASSOCIATION WITH BODY MASS INDEX IN PATIENTS WITH ANOREXIA NERVOSA

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Background: Overevaluation of body shape and weight is known as core psychopathology of eating disorders (EDs). One of the behavioral expressions is repetitive checking of body shape and/or weight. The Body Checking Questionnaire (BCQ) is a self-report inventory which assesses body checking. BCQ consists of three subscales: overall appearance scale, specific body parts scale and idiosyncratic checking scale. However, there is no equivalent questionnaire in Japanese. We developed a Japanese version of BCQ and evaluated its reliability and validity. **Methods:** After obtaining permission, we developed Japanese version of the BCQ (BCQ-J) by translating BCQ to Japanese followed by professional native English editor back-translation. We checked that there was no discrepancy in the content of BCQ and BCQ-J. Participants were ED patients aged 16 or older in the Department of Psychosomatic Medicine at the University of Tokyo Hospital between 2018 and 2019. Healthy subjects (HS) of the same age range were also recruited by web survey. All subjects completed BCQ-J, Body Shape Questionnaire (BSQ) (self-report questionnaire assessing concerns about body shape) and Eating Attitude Test 26 (EAT-26) (self-report questionnaire assessing disordered eating attitudes and behaviors). We performed an exploratory factor analysis (EFA) and assessed the reliability and concurrent validity of BCQ-J. We then investigated the association between the BCQ-J and body mass index (BMI) in patients with anorexia nervosa (AN). **Results:** 155 HS and 100 ED patients (mean age 38.9 ± 11.8 years and 32.9 ± 12.5 respectively) enrolled in this study. EFA showed

three factors with 17-items (Specific body parts scale (SBPS), Ritualistic checking scale and Comparison scale (CS)). Cronbach's alphas ranged 0.85-0.91. Total BCQ-J score and all factors had significant positive correlation with BSQ ($p < 0.001$) and EAT-26 ($p < 0.001$). Total BCQ-J score was significantly higher in ED patients than in HS ($p < 0.05$). Total BCQ-J, SBPS and CS had significant positive correlations with BMI ($p < 0.05$) in patients with AN. **Conclusions:** The BCQ-J had a different underlying factor structure from the original BCQ. BMI may be associated with severity of body checking behaviors in patients with AN. Further studies of association between weight regain and body checking behaviors in patients with EDs are required.

311) Abstract 1452

THE RELATIONSHIPS BETWEEN NEGATIVE AND POSITIVE THOUGHTS, EMOTION REGULATION AND FEAR OF CANCER RECURRENCE

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Introduction:

There is a widespread belief that positive thinking promotes a better psychological adjustment to cancer than negative thinking, including lower levels of fear of cancer recurrence (FCR). However, this assumption has never been directly tested empirically. Emotional regulation (ER) has been shown to be associated with FCR and some studies suggest that there is a bidirectional relationship between thoughts and ER. The main purpose of this study was to examine cross-sectional and prospective associations between negative/positive thoughts and FCR. It also aimed to explore the mechanisms by which negative/positive thoughts, emotional regulation and FCR are associated.

Methods:

This is a secondary analysis of a study conducted in 81 women diagnosed with breast cancer. Before the start of radiotherapy (T1) and after its completion (T2; 6 weeks later), participants completed the Fear of Cancer Recurrence Inventory (short form), the Emotion Regulation Questionnaire, the Acceptance and Action Questionnaire-II and the Thoughts and Anticipations about Cancer questionnaire (only at T1).

Results:

Participants were, on average, 59 years old ($SD = 8.5$). The cross-lagged analysis showed that the occurrence of negative thoughts at T1 was positively associated with the FCR level at T1, $\beta = 0.62$, $p < .001$, but not at T2, $\beta = 0.05$, $p = .32$. A higher occurrence of positive thoughts was also positively associated with FCR at T1, $\beta = 0.18$, $p = .04$, but not at T2, $\beta = 0.06$, $p = .22$. The mediation analysis revealed that the occurrence of negative thoughts mediated the positive association of experiential avoidance, $\beta = 0.238$; 95% bootstrap confidence interval (BCI) = [0.091, 0.418] and emotional suppression, $\beta = 0.253$; 95% BCI = [0.136, 0.365] with FCR. Results also indicated that the positive relationship between emotional suppression and FCR was significantly mediated by the occurrence of positive thoughts, $\beta = 0.057$; 95% BCI = [0.001, 0.155].

Conclusions:

These data suggest that both negative and positive thoughts play a role in increasing FCR. They also indicate that the relationship between maladaptive ER strategies and FCR is mediated by the occurrence of negative/positive thoughts. Together, these findings suggest that realistic thinking would be more adaptive and they emphasize the relevance of using cognitive-behavioral interventions to decrease FCR.

312) Abstract 1841

FRUSTRATION INTOLERANCE AND ITS ASSOCIATIONS WITH ANXIETY AND DEPRESSION

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Introduction: Frustration intolerance (FI) is an inability to accept that reality differs from personal desires (Harrington, 2006), and has been studied in clinical contexts such as rational-emotive behaviour therapy. FI has four components: emotional intolerance (an intolerance to emotional distress), entitlement (a need for immediate gratification), discomfort intolerance (a need for a hassle-free life), and achievement (a frustration related to the non-accomplishment of goals). Few studies have investigated the differential relationships between the components of FI, anxiety, and depression. This research aims at determining which of these components are associated with anxious and depressive symptoms in a non-clinical sample.

Method: Three hundred and thirty adults (82.7% women, mean age = 27.6 years \pm 9.3) completed a series of online questionnaires. These questionnaires gathered sociodemographic information and assessed FI (Frustration Discomfort Scale), anxiety (Hospital Anxiety and Depression Scale (HADS)-Anxiety subscale), and depression (HADS-Depression subscale).

Results: Regression analyses show that the emotional intolerance and achievement components of FI, as well as the sex of the participants, are independently associated with anxiety levels, ($F [3, 326] = 43.27$, $p < 0.01$), explaining 28.5% of its variance. Discomfort intolerance was the only component of FI associated with depressive symptoms, ($F [1, 329] = 40.34$, $p < 0.01$), explaining 12.1% of its variance.

Discussion: This study indicates that FI is differentially related to anxiety and depression. Anxiety is predicted by the emotional intolerance and achievement components, which is consistent with the emotional avoidance and perfectionistic tendencies associated with high levels of anxiety. The discomfort intolerance component was a predictor of depression. This association is coherent with the fact that an inability to cope with stressful events can precipitate episodes of depression. This research shows that targeting specific beliefs related to FI is useful for the treatment of both anxious and depressive symptoms.

313) Abstract 1341

HOW DO PATIENTS LIVE MEANINGFULLY IN THE FACE OF DEATH? DEVELOPING A MEASURE OF DOUBLE AWARENESS

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Modern medicine has allowed individuals with Stage IV cancers to live longer than ever before, sometimes extending a patient's life by months to years. However, these patients are still living with an incurable disease. In this context, double awareness is a term that refers to a patient's ability to engage meaningfully in life while also acknowledging and preparing for one's death. Understanding this phenomenon holds great potential for supporting individuals living with advanced cancer, yet there has previously been no way to measure the construct. The present study aims to create the first measure of double awareness by conducting the initial phases of development and validation. We generated 44 items based on the current literature, 22 of which captured the construct of "life engagement" and 22 to measure "death contemplation". These conceptually orthogonal constructs are combined to indicate a patient's double awareness profile (See Figure 1). For feasibility and acceptability of the measure and individual items, we administered it to five patients living with metastatic disease and conducted semi-structured interviews. The participants were primarily female (80%; mean age = 67.2, $SD = 6.8$), highly educated, and Caucasian (100%). All had a Stage IV cancer diagnosis (average time since diagnosis = 3.8 years, $SD = 3.5$ years). The results of the interviews indicated that the majority of the items were acceptable and resonated with patients' experiences, while four

items were removed because they were too confusing, too extreme, poorly worded or not relevant. The patients' scores all fell into the high/high categorical profile, indicating that these individuals were high in both life engagement and death contemplation. This is consistent with what we would expect from patients who self-select to participate in a research study of this nature. The results of this phase demonstrate the promise of the current measure applied to patients living with metastatic disease to capture the construct of double awareness. Future research will establish validation by administering the modified 41-item scale to 150 patients living with metastatic disease.

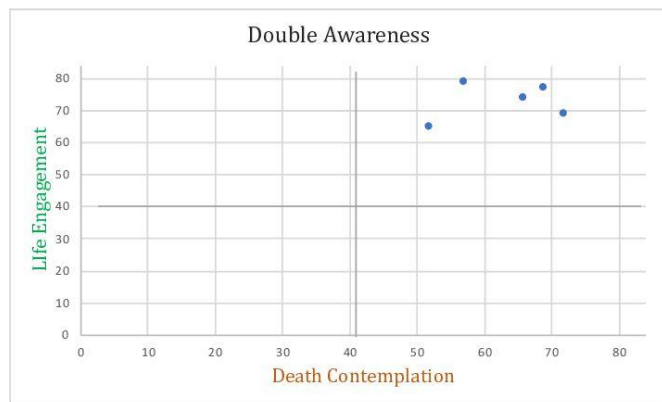


Figure 1. Distribution of Double Awareness Scores for 5 participants

314) Abstract 1284

A POSITIVE PSYCHOLOGY-BASED HEALTH BEHAVIOR INTERVENTION IN HEART FAILURE: RESULTS FROM THE REACH FOR HEALTH PILOT TRIAL

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Background: Despite the benefits of physical activity and a low sodium diet, many patients with heart failure (HF) struggle to adhere to these health behaviors. Psychological well-being may play a role in adherence, and positive psychology- (PP-) based interventions consistently have been shown to increase well-being in individuals with and without cardiovascular disease. However, PP-based interventions have received limited study in HF.

Methods: We performed a three-arm, randomized trial to examine the feasibility, acceptability, and preliminary efficacy of a 12-week, telephone-delivered, PP-based intervention, compared to a motivational interviewing- (MI-) based educational condition and treatment as usual, in 45 adults with New York Heart Association class I, II, or III HF. Participants in the PP and MI-only groups completed weekly phone calls with a study trainer. Those in the PP-based condition performed weekly PP exercises (e.g., writing a letter of gratitude) and set goals related to physical activity, diet, and or medications, while those in the MI group received education about HF-specific health behaviors and were encouraged to identify ways to improve health behavior adherence. Feasibility was measured by the number of PP sessions completed, and acceptability was measured by ratings of PP exercise ease and utility. The intervention's impact was assessed by changes in psychological health and health behavior adherence from baseline to 12 and 24 weeks.

Results: Participants completed 72.5% of all PP exercises and rated them as easy to complete (7.5/10) and subjectively helpful (7.5/10). Compared to treatment as usual and the MI condition, the PP-based intervention led to non-significant, medium- to large-sized greater increases in positive affect at 12 and 24 weeks, medium-sized reductions in sodium intake at 12 weeks, and medium- to large-sized increases in moderate to vigorous physical activity at 12 and 24 weeks.

Conclusions: The PP-based health behavior intervention was feasible, acceptable, and associated with medium to large effect-size improvements in psychological and health behavior outcomes. The impact of this intervention on health behavior adherence should be examined in a larger, next step trial. If effective, this intervention has the potential to improve both psychological and physical health outcomes in this high-risk population.

315) Abstract 1305

MEDIA EXPOSURE TO GRAPHIC IMAGES OF TERRORISM AND NEW INCIDENCE OF CARDIAC AILMENTS, WORRY, AND IMPAIRED FUNCTIONING

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Exposure to graphic images of violence in the news media is associated with acute and post-traumatic stress symptomatology following collective trauma (Ahern et al., 2004; Holman et al., 2019). Acute stress may also increase risk for subsequent cardiovascular ailments, especially among individuals worried about future events (Holman et al., 2008). However, whether exposure to graphic images of violence is linked with worry about the future, physical health, or daily functioning remains unknown. Given the relationship between perseverative cognition and physiologic biomarkers of stress (Ottaviani et al., 2016), worry about the future may be an underlying mechanism connecting distressing media exposure with physical health and functioning over time (Brosschot, Gerin, & Thayer, 2006). The present study sought to explicate the associations among graphic news exposure, worry, cardiovascular ailments, and impaired functioning over time. A representative national sample of U.S. residents (with oversampling in Boston and New York Metro; $N=3,167$) completed four surveys over the three years following the 2013 Boston Marathon bombings (BMB). Poststratification weights were applied to all analyses to facilitate population-based inferences. Generalized structural equation modeling analyses revealed that total hours of media exposure to the BMB and frequency of viewing graphic media images indirectly predicted impaired functioning over three years after the bombings through BMB-related acute stress and worry about future negative events. Hours of bombing-related media exposure also predicted new incidence of cardiac ailments, and, through these ailments, was indirectly associated with functioning three years later. Covariates included age, gender, ethnicity, income, pre-bombing mental health diagnoses, prior endocrine disorder diagnoses, and direct bombing exposure. These results demonstrate the potential for media exposure – both the amount and the content – to affect public health following collective traumas. Exposure to graphic imagery can incite distress in the viewing public, with physical and mental health correlates as many as three years after the fact among individuals who were not directly exposed to the attack. This an important public health issue to understand before future crises arise.

316) Abstract 1052

MEN WITH ANXIETY DISPLAY EXAGGERATED STRESSOR-EVOKED SYSTOLIC BLOOD PRESSURE RESPONSES

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Background: Cardiovascular disease (CVD) is the leading cause of death in the United States for both men and women. Prospective evidence suggests higher levels of trait anxiety predicts the development of hypertension. Anxiety has a much higher prevalence in females compared to males. A separate line of research suggests that

higher cardiovascular responses to acute psychological stress predicts future hypertension.

Aim: The current study aimed to examine the role of anxiety and gender in cardiovascular and state anxiety responses to acute psychological stress.

Methods: Participants (N = 80, 65.4% female) completed the Hospital Anxiety and Depression questionnaire and were divided into anxious and non-anxious groups based on established clinical cutoffs. Participants then completed a standardized stress paradigm where systolic blood pressure (SBP) was measured during a 10-minute resting baseline period and 10-minute mental arithmetic stress task. Immediately after the task, participants were asked how cognitively anxious they felt during the task (scale: 1, not cognitively anxious to 7, extremely cognitively anxious) and how this intensity impacted (scale: -3, hurtful to +3, helpful) their performance.

Results: SBP was significantly higher during stress than baseline, $F(1, 76) = 236.15, p < .001, \eta^2 = .757$. There were no significant differences in SBP reactivity between anxiety groups ($p = .37$) or between genders ($p = .55$). There was a significant gender (male, female) x anxiety (anxious, non-anxious) x time (baseline, stress) interaction for SBP, $F(1, 76) = 4.768, p = .032, \eta^2 = .059$. Post-hoc analyses indicated there were no differences in SBP at either timepoint between anxious and non-anxious women, but men in the anxious group had significantly higher SBP during stress compared to non-anxious men. There were no significant differences between anxiety groups, gender, or gender x anxiety group interactions for cognitive anxiety intensity or impact (p 's $> .10$).

Conclusions: Exaggerated cardiovascular responses to acute psychological stress may be a possible mechanism explaining the relationship between anxiety and future cardiovascular disease. Longitudinal and mechanistic research is needed to delineate the potential gender specific pathways linking heightened anxiety with increased CVD risk.

317) Abstract 1602

ASSOCIATIONS OF SLEEP HABITS AND SLEEP DURATION WITH DAYTIME RESTING HEART RATE VARIABILITY AND CARDIOVASCULAR RESPONSE TO AN ACUTE STRESSOR

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Cardiovascular disease, a longstanding leading cause of death in the United States, accounts for one in four deaths per year. Heart rate variability (HRV) provides a non-invasive measure of the heart's ability to respond to physiological and external stimuli. High HRV is associated with greater cardiovascular fitness and greater resilience to stress, while low HRV is associated with impaired homeostatic autonomic nervous system function and increased risk of cardiovascular disease. As sleep is a restorative health behavior that is essential for physiological function and psychological resilience, sleep parameters (e.g. sleep habits, sleep hygiene and sleep duration) may be associated with HRV and may suggest how sleep impacts heart health. To assess the relation between HRV and sleep, participants (N=115, M age=26.98, 56.5% female), as part of a larger study, completed self-report measures of sleep and physical health. Heart rate was continuously recorded during a paced breathing exercise and a social stress task. Inter-beat time variations in heart rate were used to obtain measures of resting and acute stress HRV. Bivariate correlations followed by linear regressions (controlling for age and sex) with sleep habits, hygiene, and duration as predictors, and resting HRV and acute stress HRV as respective outcomes were conducted. Correlations revealed that inconsistent sleep schedule habits were negatively associated with resting HRV ($r(114) = -.20, p < .05$). Sleep duration was negatively associated with acute stress reactivity ($r(113) = -.26, p < .01$).

Regressions controlling for age and sex, with all sleep predictors entered simultaneously found that sleep duration significantly predicted lower acute stress reactivity ($\beta = -2.62, p < .05$) with inconsistent sleep schedule ($\beta = -.40, p < .10$) and nighttime eating ($\beta = .61, p < .10$) predicting acute stress HRV at trend levels. This pattern of findings reveals that longer sleep duration predicts lower cardiovascular reactivity to an acute stressor. In addition, inconsistent sleep schedules (e.g. sleeping in on the weekends) were associated with lower stress reactivity, while increased nighttime eating and drinking was associated with higher stress reactivity. Overall these findings highlight sleep behavior pathways for decreasing reactivity to an acute stressor that may improve downstream heart health and reduce CVD risk.

318) Abstract 1500

GRIEF-RELEVANT EMOTIONAL INTERVIEW INDUCES ELEVATED BLOOD PRESSURE IN BEREAVED OLDER ADULTS

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Bereavement is associated with heightened cardiovascular risk. A putative mechanism for acute cardiac risk in bereavement involves patterns of emotional response after the loss. Flooding grief emotions, or "grief pangs", may especially contribute to elevations in blood pressure (BP). Studying the effects of intense bereavement-related emotions on BP can help explain the health impacts of bereavement, and safe procedures for eliciting grief-relevant emotions are needed to move this research forward. Separation Recall (SR), a procedure modeled on anger recall, has been piloted as a way of eliciting separation-relevant emotions. In SR, a semi-structured interview is conducted, in which the participant is asked to recall a scenario that evokes intense feelings of separation, grief, or abandonment. The present research examines the effect of SR on BP in preliminary data from a sample of adults within the first year of bereavement (N = 47, Age: M = 67.6, SD = 13.58). We hypothesized that systolic and diastolic blood pressure (sBP and dBP) would increase after the SR procedure. In the study, sBP and dBP were measured during two time periods. First, participants underwent a 10-minute baseline protocol involving attending to neutral stimuli, with BP measured every two minutes for a total of 10 minutes. Following the baseline period, SR was conducted for a duration of 10 minutes. After SR, participants had a 10-minute recovery period where they were asked to sit quietly with eyes open and not move, with BP measured every two minutes. Baseline sBP and dBP was computed by averaging the final 2 baseline measurements (minutes 8 and 10). Post-SR sBP and dBP were computed by averaging the first 2 measurements directly after SR (minute 0 and 2). A repeated measures ANCOVA was conducted to compare Baseline vs. post-SR sBP and dBP, adjusting for body mass index. There was a significant increase after SR for both sBP ($F(1, 44) = 12.34, p = .001, M \text{ increase} = 16.79 \text{ mmHg}$) and dBP ($F(1, 44) = 4.42, p = .041, M \text{ increase} = 6.91 \text{ mmHg}$). These results suggest that separation recall is an effective way of producing a hemodynamic response to grief-related symptoms in a laboratory setting. This method may be useful for research examining the cardiovascular impacts of grief, and may help to identify ways to limit the health toll of loss.

319) Abstract 1814

ASSOCIATIONS BETWEEN PERCEPTIONS OF STRUCTURAL RACISM, RESTING BLOOD PRESSURE, AND SELF-REPORTED HEALTH

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There are emerging data linking racism to greater cardiovascular disease and all-cause mortality among African Americans. However, while the linkage of interpersonal racism to cardiovascular disease is steadily being established, far less attention has been paid to the potential health impact of structural racism. Scholars have noted the difficulty of capturing experiences and perceptions of structural racism through survey methodology (Gee and Ford, 2011), but strongly advocate for future research to address this significant knowledge gap. To begin to address the gap, we examined the associations between perceptions of structural racism, resting blood pressure, and self-reported health. Method: Sixty-two African American adults (mean 25 years, 52 % female) completed the Institutional subscale of the Color-blind Racial Attitudes Scale (CoBRAS) and the Short Form (SF-36) designed to assess self-reported health. Resting blood pressure was recorded for 10 minutes. In linear regression analyses controlling for age, sex, and BMI, results revealed that perception of structural racism was inversely related to self-reported health ($\beta = .12$, $p < .05$) but not related to SBP ($\beta = .07$, $p > .05$). This study provides preliminary evidence that perceptions of structural racism are related to self-reported health, and may be a potential pathway through which racism is experienced as a stressor.

320) Abstract 1283

PTSD SYMPTOMS AND ITS ASSOCIATION WITH FEAR OF FALLING AND SUBSEQUENT ACTIVITY RESTRICTION IN PATIENTS WITH TIA/STROKE

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Background: Over 20% of stroke and transient ischemic attack (TIA) survivors develop posttraumatic stress disorder (PTSD) symptoms. Evidence shows that PTSD is associated with low physical activity, yet the contributing mechanisms have not been elucidated. One potential mechanism relevant in TIA/stroke survivors is a heightened fear of falling (FoF) and subsequent avoidance of physical activity. As behavioral avoidance is a hallmark of PTSD, we hypothesize that patients with TIA/stroke-induced PTSD symptoms develop a FoF and subsequently avoid physical activity due to a FoF. To test this hypothesis, the purpose of this study was to determine the association between PTSD symptoms and FoF and related activity restriction among TIA/stroke survivors.

Methods: We enrolled hospitalized participants ($n=326$) with a provisional diagnosis of TIA or stroke from a Manhattan hospital. At 1 month post discharge, PTSD symptoms were assessed using the PTSD checklist specific for stroke (PCL-S). FoF and associated activity restriction were assessed using a 5-point Likert scale, with FoF and activity restriction defined as those who reported “often” or “very often”. Binomial logistic regression was used to examine the association of PTSD symptoms with FoF and activity restriction, controlling for sociodemographic factors and stroke severity.

Results: Of the 326 participants (mean age \pm SD: 60 ± 15 y; 57% female), 87 (26%) reported FoF and 63 (19%) reported activity restriction due to FoF. PTSD symptoms were positively associated with FoF (adjusted odds ratio per 5-point PCL-S increase=1.23, 95% CI: 1.11, 1.36; $p < 0.001$) and activity restriction (adjusted odds ratio per 5-point PCL-S increase=1.24, 95% CI: 1.12, 1.38; $p < 0.001$). When expressed categorically, participants with elevated PTSD symptoms (PCL-S ≥ 30 ; n [%]=51 [15%]) had a 4.70 (95% CI: 2.13, 10.67; $p < 0.001$) greater odds of reporting a FoF and a 3.96 (95% CI: 1.76, 8.94; $p < 0.001$) greater odds of reporting activity restriction compared to participants without elevated PTSD symptoms (PCL-S < 30).

Conclusion: TIA/stroke patients with greater PTSD symptoms during the first month post hospitalization were more likely to report FoF and associated activity restriction. Interventions targeting FoF may be needed to increase physical activity levels in TIA/stroke survivors that present with PTSD symptoms post discharge.

321) Abstract 1671

THE ROLE OF CORTISOL IN THE LINK BETWEEN DIFFERENT TYPES OF CHILDHOOD ADVERSITY AND BMI IN ADOLESCENTS

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Background: Different types of childhood adversity may impact development through different underlying mechanisms and have potentially different effects on cardiometabolic health outcomes. We hypothesize that different types of childhood adversity are differentially linked to overweight and obesity in adolescents. This link may be moderated by cortisol's diurnal rhythm and acute stress cortisol reactivity.

Methods: 161 adolescents participated in the study, with age ranging from 9 to 14 years. Three groups of adolescents were included: (1) abused youth ($N=42$) (2) post-institutionalized youth ($N=41$) and (3) non-abused and non-institutionalized youth (control) ($N=78$). All participants started at 9 am with a physical exam and MRI scan, followed by lunch, interviews and questionnaires and passive drool saliva samples were collected throughout the visit. Body Mass Index (BMI) was calculated by dividing body weight by squared height (body weight in kg/body height in m^2). Cortisol levels in response to lunch were used as a measure of stress reactivity. Associations were analyzed with regression analyses and correlations.

Results: We found significant differences in BMI between the three groups of adolescents. Post-institutionalized youth had on average the lowest BMI (mean = 18.81; SD = 3.56), followed by the control youth (mean = 21.40; SD = 4.48) and the abused youth (mean = 26.75; SD = 18.1), $p = 0.004$. The effect of group (post-institutionalized, abused and control) on BMI was not significantly moderated by diurnal cortisol rhythm or cortisol reactivity in response to lunch (all p values > 0.05). Higher lifetime stress scores were associated with higher BMI, especially in the post-institutionalized youth group ($r = 0.471$; $p = 0.002$). Cortisol reactivity was negatively correlated with lifetime stress scores in the group with abused youth ($r = -0.526$; $p = 0.036$).

Discussion: Our results indicate different types of childhood adversity are differentially linked to BMI in adolescents. Abused youth may be at greater risk for overweight and obesity, and post-institutionalized youth showed a BMI that is close to the cut-off for underweight. Higher lifetime stress exposure is linked to higher BMI in adolescents.

322) Abstract 1242

THE RELATIONSHIPS BETWEEN ADVERSE CHILDHOOD EXPERIENCES, CO-PARENTING QUALITY, AND MENTAL HEALTH SYMPTOMS IN COLLEGE STUDENTS

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Background: Nationwide collegiate data have shown a dramatic increase in the prevalence of depression and anxiety disorders among college students. Data from the Association for University and College Counseling Center Directors (2017) suggest that 35% of college students experience depressive symptoms and 48% experience anxiety symptoms. The majority of research has focused on the effect of stressful events during college on students' mental health. In fact, the pre-college environment and experiences are largely overlooked as potential factors influencing college student mental health. Grounded in the ecological theory of human development and risk-resilience theory, the current study examined associations between adverse childhood experiences (ACEs), co-parenting quality during childhood, and mental health symptoms in a sample of college students. We hypothesized that more ACEs and low co-parenting quality would be associated with more depressive and anxiety symptoms.

Methods: This study included 254 college students aged 18-25 years ($M = 19.2$ years, $SD = 1.18$). Approximately 82% of students identified as female; 41% identified as White, 20% as Black, 14% as Pacific Islander/Asian, 7% as Latinx, and 18% as Multiracial/Other. Participants completed the ACEs scale (Felitti et al., 1998), the Co-parenting Relationship Scale (CRS; Feinberg, 2003), the Center for Epidemiological Studies - Depression scale (CES-D; Radloff, 1977), and the Generalized Anxiety Disorder scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). Multiple hierarchical regressions were used to examine hypotheses.

Results: Results indicated that 75.5% of students reported at least one ACE and 51% of students reported experiencing two or more ACEs before the age of 18. Hierarchical regressions indicated that high scores on the ACEs scale were associated with more depressive symptoms $F(1,224) = 27.11, p < .01$ and more anxiety symptoms $R^2 = .05, F(2,244) = 8.27, p < .01$. Low co-parenting quality was associated with more anxiety ($r = -.09, p < .00$) and depressive symptoms ($r = -.07, p = .23$).

Discussion: These findings suggest that college and university systems should screen for ACEs as part of their efforts to identify students at higher risk for mental health symptoms, as well as consider students' previous family environments. Study limitations and future directions will be discussed.

323) Abstract 1426

MEANING IN LIFE AND CARDIOVASCULAR RESPONSES TO ACUTE STRESS

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Meaning and purpose in life, or the feeling that one's existence is significant and that one possesses a sense of intentionality and goal-directedness, is a central component of mental and physical health. However, there is limited knowledge regarding the underlying psychobiological mechanisms that support the salubrious effects of meaning and purpose in life. The current study reports results from an experiment designed to evoke the salience of meaning and purpose in life to test whether trait meaning and meaning salience, respectively, influence blood pressure and heart rate responses to acute laboratory stressors. Healthy, community participants ($N = 148$; 66% female; $M(SD)_{age} = 37.2(14.4)$ years) were randomly assigned to complete a reading and writing exercise that encouraged reflection about experiences in their life that are especially meaningful (meaning group) or to participate in a control task (control group). After the experimental manipulation, all participants underwent an acute stress protocol. Blood pressure and heart rate were measured throughout baseline, stressor (mental arithmetic, speech task), and recovery periods. Participants in the meaning group reported that the reading and writing exercise was more enjoyable and less stressful than the control group. The meaning group also reported more life purpose, happiness, engagement, and life meaning and less anxiety than the control group immediately following the reading and writing exercise. Groups did not differ in average blood pressure or heart rate at any part of the acute stress protocol. However, those who reported more meaning salience after the experimental manipulation had higher diastolic blood pressure during the stress tasks and lower heart rate during recovery ($r_s = .20$). Further, higher trait purpose in life predicted lower baseline blood pressure and heart rate, and higher trait search for meaning in life predicted lower blood pressure and heart rate reactivity to acute stressors. This study is among the first to empirically test a causal pathway through which meaning and purpose in life "gets under the skin" to affect cardiovascular processes. Given increased scientific attention to comorbidity between mental and physical health, this project provides valuable and opportune insights into the psychobiological mechanisms linking the social world to health and well-being.

324) Abstract 1652

OBJECTIVELY-MEASURED PHYSICAL ACTIVITY INTENSITY LEVELS AND MOMENTARY POSITIVE AND NEGATIVE AFFECT IN DAILY LIFE

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Physical activity has been associated with changes in positive (PA) and negative affect (NA), but whether this relationship unfolds in daily life is less known. Past work has been limited by infrequent sampling and/or self-reported physical activity over limited days. Questions also remain about how the intensity of physical activity may influence affect changes in daily life. The current investigation explored how different intensities of objectively-measured physical activity relate to momentary experience of PA and NA in two cross-sectional samples of healthy, midlife adults. Sample 1 consisted of 477 employed adults (mean age=42.7 years, 81.1% white, 52.4% female), and Sample 2 consisted of 391 adults (mean age=52.6 years, 77.5% white, 61.4% female). Over a 4-day monitoring period, participants across both samples wore an accelerometry device (SenseWear) and answered hourly interview questions about recent affect (e.g., in the last 10 minutes, feeling happy? Cheerful? Sad? Angry?) using an electronic device during waking hours. Momentary PA and NA were calculated as the mean of relevant interview items. Physical activity was derived as mean energy expenditure (METs units) in the prior 30 minutes as well as number of minutes spent in light (1.5-3.0 METs) and moderate-to-vigorous activity (> 3 METs).

Multilevel models revealed that increased engagement in recent physical activity was associated with greater PA and NA in both samples (Study 1 PA: $b=.049, p<.001$ and NA: $b=.018, p=.001$; in Study 2 PA: $b=.078, p<.001$ and NA: $b=.07, p<.001$). When broken down by intensity, more time spent in light physical activity was associated with greater NA across studies (Study 1: $b=.002, p=.001$; Study 2: $b=.007, p<.001$), whereas results for PA were significant (Study 1: $b=.004, p<.001$) or marginally significant (Study 2: $b=.003, p=.07$). By contrast, more time spent in moderate-to-vigorous activity was associated with greater PA (Study 1: $b=.003, p=.003$; Study 2: $b=.009, p=.003$ and NA (Study 1: $b=.001, p=.02$; Study 2: $b=.006, p<.009$) across samples. All effects were significant after controlling for sex, age, race, education, habitual physical activity, and trait PA or NA. These results extend previous work to suggest that any level of physical activity is associated with momentary increases in both NA and PA in daily life.

325) Abstract 1246

FORGIVENESS AMONG PARTNERS OF BREAST CANCER SURVIVORS: ASSOCIATIONS WITH PSYCHOSOCIAL OUTCOMES

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Although forgiveness and its correlates have been a subject of extensive study, fewer investigations have been conducted in medical settings. This cross-sectional study offered a preliminary evaluation of relationships between trait forgiveness and indices of relationship functioning and adjustment to illness, among partners of breast cancer survivors. We anticipated that greater forgiveness would be tied to enhanced relationship outcomes, and more tentatively, to more favorable adjustment to illness. In view of potential sex differences we focused on male partners.

Participants were male spouses of nonmetastatic breast cancer survivors enrolled in a larger study, who were assessed at least 6 months since completion of treatment. Average age was 60.7 years and 13.2% were African American; 76.3% of survivors had received adjuvant chemotherapy. Participants completed a validated measure

of trait forgiveness (Trait Forgivingness Q). Relationship outcomes included marital adjustment (Brief Dyadic Adjustment Scale), unsupportive interactions (Social Constraints Scale), and sexual interest (PROMIS). Adjustment to cancer was evaluated with indices of illness-related helplessness, acceptance, and benefits (Illness Cognition Q) and general emotional distress (Brief Symptom Inventory).

Bivariate analyses indicated that higher levels of trait forgiveness were associated with significantly fewer social constraints ($p = .004$), greater sexual interest ($p = .04$), and marginally better marital adjustment ($p = .065$), as well as significantly reduced helplessness in response to the illness ($p = .01$) and greater acceptance ($p = .005$). It was not related to perceived benefits or to general distress. In separate multiple regression analyses that accounted for prior chemotherapy and other significant clinical/demographic covariates, forgiveness remained significantly related to fewer social constraints ($\beta = -.42, p = .009$), greater sexual interest ($\beta = .35, p = .03$), reduced illness-related helplessness ($\beta = -.43, p = .006$), and greater acceptance ($\beta = .43, p = .008$).

The focus on forgiveness among partners of cancer survivors is relatively novel. Findings from this initial investigation suggest that dispositional forgiveness may have adaptive value for relationship outcomes, and for broader aspects of adjustment to illness, among partners of cancer survivors.

326) Abstract 1376

HOW POSITIVE AND NEGATIVE AFFECT RELATE TO POSTOPERATIVE PAIN IN CHILDREN UNDERGOING SURGERY

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During postoperative recovery, positive affect has been shown to be associated with lower levels of pain, while negative affect is associated with higher levels of pain. Research in this area primarily consists of adult samples. More recent research asks if subscales of positive affect such as calm, well-being, and vigor could be related to pain experiences. Studies of postoperative pain in children relating to positive and negative affect are limited, with none examining the connection between positive affect subscales and negative affect subscales (anger, anxiety, and depression) and children's pain. This study addresses that gap by uncovering the relationships between the aforementioned subscales to postoperative pain in children. This study was conducted at Children's Hospital of Orange County with children ($N=56$) aged 2-12 who had elective surgery and completed daily diaries assessing pain and affect at home on days 1, 3, and 7 post-surgery. Results revealed that baseline affect was not associated with postoperative pain ($ps > .05$), but state affect was associated with reports of pain on the same day such that children experiencing higher levels of calm, well-being, and vigor on day 1 had lower levels of pain that same day (calm: $r(56) = -0.49, p < .001$, well-being: $r(56) = -0.52, p < .001$, and vigor: $r(56) = -0.51, p < .001$). This pattern held for same-day measurements on day 3 (calm: $r(49) = -0.36, p < .05$, well-being: $r(49) = -0.50, p < .01$, and vigor: $r(49) = -0.52, p < .01$), but not for day 7 when only well-being was associated with pain ($r(51) = -0.29, p < .05$). Depression was the only subscale of negative affect that showed a positive association across all three follow-up assessments of pain ($ps < .01$). Anger was positively associated with pain only on day 1, and anxiety was associated with pain only at days 3, and 7 ($ps < .05$). The findings demonstrate that associations of positive affect subscales and pain diminish over time and investigating negative affect subscales may be warranted since only depression was consistently correlated with pain at all three assessments. Clinically, intervening on emotions by increasing positive and decreasing negative affect could have implications for pain management. Future

studies might investigate how utilizing subscales of affect post-surgery could decrease child postoperative pain.

327) Abstract 1776

THE SURPRISING ASSOCIATIONS OF SURPRISE FACIAL EXPRESSION WITH CARDIOVASCULAR FUNCTIONING

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It has been theorized that facial expressions play a role in emotion regulation. This is thought to occur via exerting action on vagal tone, which directly influences parasympathetic function and heart rate variability. For example, positive facial expressions (i.e., smiles) have been connected to better cardiovascular stress recovery. However, the role of other facial expressions has been largely ignored. Here, we explore whether naturally occurring expressions of surprise, considered one of the basic emotions, influences vagal function during a resting period. Healthy individuals ($N = 268$) participated in a five-minute resting period while cardiovascular activity was continuously monitored. We calculated the means of heart rate variability in terms of Root Mean Squared Successive Differences (RMSSD) and Respiratory Sinus Arrhythmia (RSA) for this resting period. Facial expressions were recorded continuously and analyzed with Noldus Face Reader Software to categorize facial movements into neutral or surprised facial expressions (i.e., average levels on a scale of 0 to 1 and time duration of expression). We considered sex (66 Males and 202 Females), body mass index ($M = 24.60 \pm 5.65$), and age ($M = 20.58 \pm 3.27$) as possible covariates for the analyses. No demographics effects were found on facial expressions, RMSSD, or RSA. While amounts of surprise expression were low on average during this time, correlational analysis revealed that higher average expression of surprise ($M = .23 \pm .20$) was associated with higher RMSSD ($M = 50.22, \pm 25.63$), $r(268) = .128, p = .036$. Moreover, the duration of surprised expressions ($M = 51.93 \pm 61.00$) was also associated with higher RMSSD ($r(269) = .173, p = .004$). Increased average intensity of surprise ($M = .23 \pm .20$) was associated with higher RSA ($M = 6.74 \pm .92$), $r(268) = .159, p = .009$, as was the duration of surprise $r(268) = .196, p = .001$. As a counterpoint, neutral expressions were not tied to any of these parasympathetic indicators. Aligned with polyvagal theory of emotion, we present evidence that facial movements are linked with cardiovascular systems: increased average and duration of surprised facial expression were associated with higher RMSSD and RSA, potentially enhancing emotion regulation during resting periods. These findings point to the possible value of facial expressions seldom assessed in health research.

328) Abstract 1597

RUMINATION AND CARDIOVASCULAR HABITUATION TO ACUTE PSYCHOLOGICAL STRESS

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Background: Cardiovascular reactivity to stress is an established marker of lifetime disease risk, with both elevated and blunted reactions empirically identified as being predictive of ill-health. However, the conventional cardiovascular reactivity hypothesis ignores the crucial element of prolonged activation (Brosschot, Pieper & Thayer, 2005). Research has started to incorporate a broader characterization of the cardiovascular stress response to include cardiovascular *non-habituation* – whereby individuals persistently exhibit exaggerated cardiovascular responses (blood pressure, heart rate) on exposure to the same recurring stressor (Gianferante et al., 2014).

One factor that is highly likely to explain why some individuals do not habituate to stress may be rumination. Broadly defined, rumination consists of 'past-centred negative, unwanted and persistent thoughts' (Gianferante et al., 2014). The physiological consequences of an acute

stressor may be prolonged for individuals who ruminate by compromising their ability to habituate to repeated stress. Therefore, the capacity to habituate to stress represents an important aspect of individual differences in the etiology and progression of cardiovascular disease.

The aim of the current research was to examine if trait and state rumination influenced cardiovascular habituation to a recurring acute psychological stressor.

Method: Following a resting period (10 minutes), participants ($n = 152$) completed the same stress task twice (5 minutes for each task), separated by an inter-task interval (10 minutes). All participants had their cardiovascular parameters monitored through the entire protocol using a Finometer hemodynamic cardiovascular monitor. Data were analysed using a $2 \times 2 \times 2$ mixed factorial analysis of covariance, with phase (first stressor, second stressor) as the within subject's factor and trait rumination (high, low) and state rumination (ruminating, not ruminating) as the between subject's factors. The dependant variables were SBP, DBP and HR.

Results: A 3-way interaction revealed that high trait ruminators who engaged in state rumination displayed the worst heart rate habituation from the first to the second exposure to the stressor.

Conclusion: The findings suggest that individuals who are trait ruminators and who engage in state rumination do not sufficiently habituate to recurring stress.

329) Abstract 1623

CONTRIBUTION OF TIME ESTIMATION TO HEARTBEAT COUNTING TASK PERFORMANCE UNDER ORIGINAL AND MODIFIED INSTRUCTIONS

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Interoceptive accuracy (i.e., the capacity to detect internal states) is thought to play a central role in a variety of fundamental phenomena (e.g., adaptive responses, feelings, drives, emotions) and to predict mental health (e.g., depression and anxiety), health risk factors (e.g., obesity) and psychosomatic diseases (e.g., irritable bowel syndrome). Interoceptive accuracy is, however, frequently assessed using the Heartbeat Counting Task (HCT), requiring participants to count the number of times their heart beats. The validity of this task has indeed been questioned. It has been suggested that participants may perform the task by guessing their heart rate rather than actually feeling their heartbeats. They could guess by estimating the time elapsed during a counting interval and, possibly, combining it with their knowledge of their heart rate. Whilst some research suggests that time estimation ability does not impact HCT performance, these results are associated with analytical issues and further scrutiny is thus required on this topic. We revisited this question by (i) relying on new analytic strategies, and (ii) examining the role of time estimation and knowledge about heart rate in HCT performance, while varying task instructions. In addition, we replicated recent analyses addressing the construct validity of HCT scores. Overall, the findings support the role of time estimation ($r=.41, p<.001$) and knowledge about heart rate ($r=.27, p=.004$) in HCT performance under original task instructions, and confirm the low validity of the interoceptive accuracy scores derived from it. Findings also suggest that causality flows from time estimation to heartbeat counting rather than the opposite. Interestingly, the modification of instructions seems to have been effective in decreasing the influence of time ($r=.08, p=.39$, and $r=.22, p=.002$) and knowledge-based ($r=.02, p=.85$) estimation strategies, improving HCT validity. Finally, we discuss two potential solutions to address the above-mentioned issues. Meanwhile, given the many limitations of the HCT described here and elsewhere, we urge researchers interested in cardiac

interoception to test the robustness of published effects and to reconsider the interpretation of replicable ones.

330) Abstract 1894

THE ASSOCIATION OF EARLY SIGNS OF FRAILTY WITH PSYCHOLOGICAL WELLBEING, CHRONIC STRESS, AND AGE - A SWISS MULTI-STUDY REPORT IN MIDDLE-AGED AND OLDER ADULTS

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Frailty represents a state of increased risk for age-associated disease, disability, and a reduced quality of life. A marked age-related decrease in handgrip strength is an early indicator of frailty and has previously been independently linked to depression and chronic stress. There is limited knowledge on the combined effect of psychological wellbeing in general and chronic stress, especially with regard to sex-specific differences. Therefore, the present analysis aimed first to investigate whether chronic stress mediates the effect of psychological wellbeing on handgrip strength in men and women. Second, the moderating effect of age on the mediation was to be considered, expecting that higher age would increase the mediation effect.

Data stem from four individual cross-sectional studies conducted in Switzerland, including a total of 492 healthy participants (46% women) aged 40 to 75. Maximal handgrip strength (kg) was assessed with a hand dynamometer, while psychological wellbeing (SF-36) and chronic stress (TICS-SSCS) were investigated using validated questionnaires. The statistical model was tested using a moderated-mediation model with PROCESS separately for sex, accounting for multiple confounders (marital status, work, income, activity, smoking, alcohol consumption).

Psychological wellbeing was significantly positively associated with handgrip strength in both men (direct effect = .36; $p<.001$) and women (direct effect = .14; $p=.030$). In men but not women, the mediation model moreover revealed that chronic stress partially mediated the relationship of psychological wellbeing on handgrip strength, explaining 28.69% of the total effect. The moderated mediation revealed that the indirect effect of psychological wellbeing on handgrip strength through chronic stress was not moderated by age in either sex (Men: CI= [-.03, .06], women CI=[-.06, .02]).

Concluding from these analyses, fostering psychological wellbeing could reveal a direct effect on handgrip strength and thereof physical functioning in middle-aged and older adults. Moreover, targeting chronic stress and coping mechanisms could be especially beneficial in men, although additional factors of influence seem to be at hand. Furthermore, assessing handgrip strength in general care could provide a sensitive measure for both healthy physical and psychological aging.

331) Abstract 1842

MOTHERS' ROLE STRAIN AND THE INFLUENCE ON DEPRESSIVE SYMPTOMS

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BACKGROUND: The U.S. Bureau of Labor Statistics (2017) reported that 71.1% of women with children under 18 participated in the labor force and for mothers with children under age 6 it was 65.1%. Whereas paid maternal employment can be beneficial and even essential for families by providing greater financial security, it also has the potential to add increased role strain due to balancing the demands of motherhood and homecare with employment. These demands from women's multiple roles (provider, mother, employee, etc.) could contribute to the mental health of the mother, specifically depressive

symptoms, and single mothers may be particularly susceptible. Single mothers have been shown to have high role strain due to increased responsibilities and limited time and resources. **METHOD:** Depressive symptoms were examined in 112 married-working mothers, 112 married-non-working mothers, and 112 single-working mothers. We hypothesized single-working mothers would have higher self-reported depressive symptoms than both married-working and married-non-working mothers, and that married-working mothers would have higher self-reported depressive symptoms than married-non-working mothers. **RESULTS:** Participant's scores on the Center for Epidemiologic Studies Depression scale ranged from 0 – 43 ($M_{CESD} = 13.9, SD = 8.56$). Analysis revealed a statistically significant difference between the three mother groups $F(2, 329) = 10.52, p < .001, \eta^2 = .06$ with single-working mothers showing the highest depressive symptoms. Post-hoc testing revealed single-working mothers' self-reported more depressive symptoms than both married-working ($M = 4.93, SE = 1.12$) and married-non-working mothers ($M = 3.74, SE = 1.12$). However, there were no differences between married-working and married-non-working mother's depressive symptoms ($M = 1.19, SE = 1.12$). **CONCLUSION:** Research shows single-working mothers to have higher role strain; these findings provide evidence that single-working mothers also experience higher depressive symptoms than both married-working and married-non-working mothers and that these do not differ between working- and non-working mothers. These findings demonstrate the need for greater attention toward reducing single-working mothers' role strain which may reduce depressive symptoms.

332) Abstract 1594

MAKING CONTACT: THE ASSOCIATION BETWEEN REGULAR FRIENDLY PHYSICAL TOUCH AND HEART RATE IN THE CONTEXT OF STRESS

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Background: Past research on physical contact has largely been focused on parent-child and intimate partner relationships. In these contexts, touch has been shown to produce physiological changes in the body, alleviate stress, and reduce pain, but little is known about the association between day-to-day non-romantic touch and physiological health outcomes. Thus, our aim was to examine the association between average frequency of non-romantic physical touch and heart rate measurements before, during and after a social stress task.

Methods: 71 undergraduate students (mean age=19.5, 63.4% Female, 83.1% caucasian) were recruited through a university subject pool. We used the recently developed 20-item Personal Affection & Touch Scale (PATS) to assess general frequency of physical contact (e.g., hugs, high fives, hand shaking) with non-romantic partners. Heart rate (HR) was measured at baseline, during, and after the Trier Social Stress Test. We also assessed demographics relevant to the variables of interest. Bivariate Pearson's correlations and multiple regression analyses were utilized to examine the associations between physical touch and heart rate. Only participants with complete data were used in each analysis.

Results: Unadjusted analyses revealed that higher frequency of physical touch was associated with lower average baseline HR ($r(69) = -.409, p < .001$), as well as lower HR during ($r(67) = -.383, p = .001$) and after stress ($r(69) = -.339, p = .004$). The associations still held when controlling for age, race, gender and specific health behaviors. In further exploration, most individual items of the PATS (e.g. arms around shoulder, gentle touching) were associated with a lower baseline heart rate, indicating that these findings are not due to a single form of physical contact. **Conclusions:** Higher levels of non-romantic touch are associated with lower heart rate in general, including in times of stress. These results support previous studies suggesting that physical touch is an important factor for well-being.

333) Abstract 1871

MEASURING CYTOMEGALOVIRUS IGG TITERS IN SALIVA: RELATION TO MEASURES OF ORAL INFLAMMATION, BLOOD CONTAMINATION, AND SALIVA FLOW RATE, AND CORRESPONDENCE WITH SERUM TITERS AND STATUS

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Background: Cytomegalovirus (CMV) is a latent virus infecting more than 50% of US adults that can have serious health effects among the immunocompromised and when infection occurs in utero. There are striking disparities in the risk of CMV infection, specifically among childcare workers and racial/ethnic minorities. Minimally invasive means of identifying CMV serostatus, sero-conversion, and antibody titer are needed to reduce infection risk and subsequent health problems. We examine the utility of salivary CMV IgG to predict serum CMV IgG titer and serostatus, and whether the CMV IgG serum-saliva correlation is strengthened when adjusted for common salivary confounds.

Methods: Healthy adults ($N=98$) provided matched blood and whole saliva samples. Biospecimens were assayed for CMV IgG. Saliva was also tested for markers of oral inflammation (IL-1 β , IL-6, IL-8), blood leakage (transferrin), tissue remodeling (MMP-8), and flow rate (total protein). Spearman's correlations assessed relations between salivary and serum CMV IgG titer and between salivary CMV IgG and oral immune and flow rate markers. Regression models examined bivariate and adjusted relations between serum and salivary CMV IgG levels and serostatus.

Results: Levels of CMV IgG were higher in serum ($M=13.67, SD=16.73$) than saliva ($M=6.41, SD=7.81; t(97) = -5.91, p < .001$). CMV IgG was strongly positively correlated across biospecimen ($\rho(96) = .70, p < .001$). Salivary CMV IgG was associated with indices of oral inflammation ($\rho(96) = .26-.39, p < .01$), blood leakage ($\rho(96) = .40, p < .001$), and tissue remodeling ($\rho(93) = .30, p < .01$). Adjusting for these confounders improved the estimation of salivary CMV IgG. However, serum CMV IgG explained the majority of variation in salivary CMV IgG in unadjusted and adjusted models ($\eta^2 = .57$ and $.66$, respectively). Salivary CMV IgG titers predicted CMV serostatus ($OR=1.74, 95\% CI [1.39, 2.19], p < .001$).

Discussion: Measuring CMV IgG in saliva may be a feasible and reliable approach to large-scale CMV monitoring and have the potential to advance public health, clinical practice, workplace safety, and biobehavioral research. Future studies examining salivary CMV IgG and IgM in larger, more diverse, and clinical samples, and among individuals experiencing psychosocial stress, are needed.

334) Abstract 1355

ENGAGING STAKEHOLDERS TO UNDERSTAND PREFERENCES FOR PERSONALIZED (N-OF-1) TRIALS IN PATIENTS WITH MULTIPLE CHRONIC CONDITIONS (MCCS)

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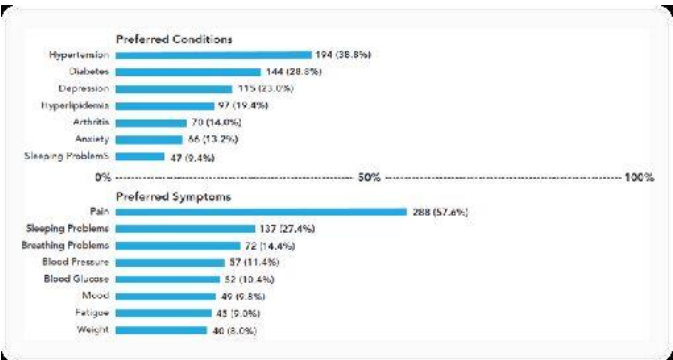
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MCC treatment is traditionally driven by conventional parallel group randomized controlled trials, which can identify the *average* treatment effect, but obscure *individual patient heterogeneity* of treatment effects. Personalized Trials (PT) offer tailored treatment to the patient through multiple period crossover experiments comparing ≥ 2 treatments. Despite potential to advance therapeutic precision and engage patients in treatment, uptake of PT into clinical care remains low. We engaged stakeholders in the design and conduct of a national survey to determine circumstances under which multimorbid patients would be willing to participate in PT and determine the design and conditions that should be targeted.

With a Collaboratory of 30 stakeholders, we developed an interview guide and focus groups of patients and care providers to gain a preliminary understanding of attitudes toward PT. The Collaboratory designed a survey that elicited preferences for PT among a national sample of patients with MCCs recruited from a general population panel maintained by the Harris Poll Online. Participants accessed a survey assessing preferred conditions, symptoms, and design attributes for PT. The Collaboratory reviewed results to create a finalized list that reflected the patients' surveyed opinions.

Responses were collected from 501 patients with ≥ 2 chronic conditions (mean age 56.1). The most frequently selected comorbid conditions amenable to PT included pain, hypertension, diabetes, sleep problems, and depression. The majority (82.0%) were interested in participating PT, of the uninterested, 23.1% indicated that they would be willing if paid. Clinician involvement (86.4%) and patient treatment selection (88.0%) contributed to patient interest in PT. Interest was lower if design attributes included clinician blinding (59.2%), no treatment/placebo treatment (57.5%), and costs (41.8%).

Engaging stakeholders increased understanding of general attitudes towards specific aspects of PT and shed light on innovative ways to increase uptake of PT in clinical practice and advance patient centered care. By providing insight on various aspects of PT implementation, the present study moves us closer to bridging the gap between research and clinical practice. Studies may benefit from using this approach to gain insight on increasing the uptake of patient centered care.



335) Abstract 1354
USING DEEP NEURAL NETWORKS TO PREDICT COGNITIVE PERFORMANCE

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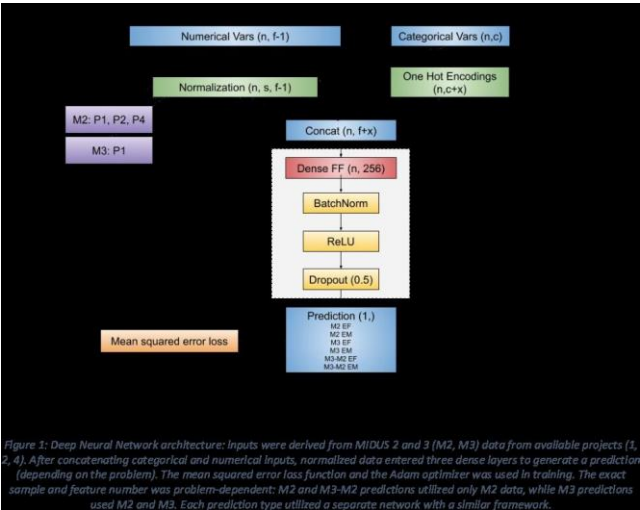
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Background: Deep learning methodologies optimize statistical model parameters over large networks, utilizing multiple levels of non-linear operations. Models are typically fit during a training process and assessed independently on test samples unseen by networks. While deep learning models are currently used successfully in healthcare data, the mix of data sources, requirement of large datasets and challenges in interpretability make it difficult to extend their uses to cognition. Here, we utilize deep neural networks (DNNs) to predict cognitive performance in a large national sample, the Midlife in the United States (MIDUS) study.

Methods: Data from MIDUS, specifically encompassing psychosocial, sociodemographic, health (P1), daily diary (P2), comprehensive biomarker (P4) variables and the Brief Test of Adult Cognition by Telephone (BTACT), were collected from two occasions (M2, M3), an average of 9 years apart for P1 and at M2 for P2 and P4. The BTACT comprises of measures from two domains: episodic memory (EM) and executive functioning (EF), collected through tasks including free recall, attention switching, inhibitory control, number series, and backward digit span. We assessed a population (N=721, 45% male) ranging in age from 34 to 83 years (55.1 ± 10.7 years) with a mean education of 14 years. Over 12,000 variables were modeled using DNNs, with EM and EF from M2, M3 and delta scores as the outcome variables. The regression neural networks were composed of three dense layers of 256-dimensions, each with non-linear activations, and with the goal of minimizing the mean-squared error during training. We implemented early stopping, using cross validation metrics during training, and a low learning rate, to prevent the network from overfitting to the training samples.

Results: The DNN performed best in predicting M3 EF ($R^2=0.31$, $SD=0.043$, $CI=[0.28, 0.35]$), followed by M2 EF ($R^2=0.24$, $SD=0.13$, $CI=[0.14, 0.33]$). EM had lower predictability in M3 ($R^2=0.093$, $SD=0.046$, $CI=[0.06, 0.13]$) and was worse in M2 ($R^2=-0.08$, $SD=0.07$, $CI=[-0.14, -0.02]$). Our DNN architecture was not able to predict change in EF or EM.

Conclusion: These findings highlight the potential for deep learning methods to predict cognitive performance.



336) Abstract 1298
FAMILY HISTORY OF SUBSTANCE USE AND CHILD ULTRA-PROCESSED FOOD INTAKE

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Preliminary evidence shows that ultra-processed foods high in refined carbohydrates and fat (e.g., pizza, ice cream) exploit neural reward circuitry (e.g., hyperactivate the ventral striatum), induce addictive-like responses (e.g., lead to intense cravings), and cause psychological withdrawal symptoms after dietary restriction (e.g., increase negative emotions). Moreover, greater ultra-processed food intake is linked to cardiometabolic dysfunction, chronic disease incidence, and premature death. It is therefore critical to identify individuals at risk for greater ultra-processed food intake. Given similarities between ultra-processed foods and substances of abuse, a growing body of research has tested whether risk factors for substance use may offer transdiagnostic utility. Specifically, evidence suggests that family history of substance use may confer risk for greater food responsiveness and sweet liking. However, no prior work has (1) tested whether family history of substance use selectively increases risk for ultra-processed food intake and (2) separately tested the effect of prenatal versus postnatal family history of substance use. To fill these gaps in the literature, we conducted an archival data analysis using data from the Fragile Families & Child Well-Being Study ($N = 4,898$). Parents reported on their level of substance use during pregnancy and after childbirth. Parents also reported on their child's diet at child ages 5 and 9, and children reported on their diet at age 15. Over and above the influence of child age, child sex, family income, and parental body mass index, family history of substance use selectively predicted greater child ultra-processed food intake. In particular, greater prenatal maternal substance use consistently predicted greater child sweets intake at ages 5, 9, and 15. To follow-up, we will test whether greater prenatal maternal substance use predicts child ventral striatal activity in response to point-based rewards during a modified monetary incentive delay task; this will be tested in a subset of children from the original study who underwent an fMRI scan ($n = 128$). These results have potential clinical implications because they suggest screening for prenatal maternal substance use may identify children at risk for the psychological and physical health complications associated with greater ultra-processed food intake.

337) Abstract 1714

RELIGIOUS AND SPIRITUAL BEHAVIORS BUFFER THE LINK BETWEEN STRESS AND SLEEP HEALTH

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Objective. A negative association of stress and sleep health is well documented, whereas less is known about how other psychosocial factors impact this link. A recent study (Ellison et al., 2019) examined the role of religiousness and spirituality (R/S) in sleep health and found that religious cognitions, but not other aspects, moderated the stress-sleep link. We extended their study by examining multiple aspects of R/S in the stress-sleep link, analyzed at daily and global levels, and assessing both subjective and objective sleep. **Methods.** Participants were students at a religious college ($N = 164$). Data were collected at a lab visit and over the following week using online daily diaries and activity trackers that monitored time asleep. At baseline, participants completed the Pittsburgh Sleep Quality Index (PSQI), the Attitudes Toward God measure, and the Brief Multidimensional Measure of Religiousness and Spirituality (BMMRS). Diaries were completed each morning and participants reported the previous day's stress, sleep (adapted from the PSQI), and R/S behaviors and experiences (adapted from the BMMRS). **Results.** Data were analyzed in SPSS with moderation models using aggregated data and multilevel models using daily data. At the global level, daily stress predicted sleep quality (SQ ; $b = -.67^{***}$) and this association was moderated by prayer frequency ($b = -.15^{**}$) and belief in a comforting God ($b = .09+$). Worship attendance ($b = .70+$), Daily Spiritual Experiences (DSE; $b = .22^*$), and belief in an angry God ($b = -.17^*$) each predicted SQ . Time asleep was predicted by daily stress ($b = -.36.72^{**}$) and was moderated by DSE ($b = .25.44^*$) and belief in a comforting God ($b = .25.44^*$; $b = 7.90^*$). At the daily level, we found that daily stress was

associated with that night's self-reported SQ and time asleep ($b = -.48^{***}$; $b = -16.92^{***}$). Belief in an angry God ($b = -.17^*$) and DSE ($b = .23^{**}$) each predicted daily SQ and belief in a comforting God predicted daily time asleep ($b = 5.47^*$). **Conclusion.** As expected, aspects of R/S independently predicted sleep health and some moderated the stress-sleep association. The predictors and moderators identified in the aggregate, or global, models were not identical to those at the daily level. Thus, our findings highlight the importance of examining both global and daily levels in participants' lives and measuring sleep subjectively and objectively.

338) Abstract 1716

PSYCHOLOGICAL AND MONETARY INFLUENCES OF COMFORT OF LOW-INCOME INDIVIDUALS' NUTRITION-RELATED BEHAVIORS

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Low-income individuals often choose comforting, nutrient-poor foods increasing their chronic disease risk. Additionally, these foods are thought to satiate hunger in a cost-effective manner, alleviate stress, influence social status, taste good, bring pleasure, and potentially mitigate other life stressors like unstable housing and employment. Less clear is what psychological or economic factors contribute to individual value in food comfort and how comfort relates to behavior. To expand on previous research, this study examined how personal factors (i.e., how healthy an eater views themselves [schema], attitudes toward healthy eating, and money spent on food) influence value in food providing comfort. Low-income shelter residents ($N = 160$) were recruited from Dallas/Ft. Worth to participate in a baseline screening of nutrition-related variables. Participants were 51.2% Black ($N = 82$) and 62.9% male ($N = 100$), had a mean age of 46 years ($SD = 13.19$), and 73% earned less than \$10,000 a year ($N = 116$). After controlling for demographic characteristics, stress, and eating competency, more positive nutrition attitudes, $\Delta R^2 = .04$, $\Delta F(1, 128) = 5.83$, $p = .02$, and more money spent on food, $\Delta R^2 = .04$, $\Delta F(1, 127) = 6.66$, $p = .01$, predicted greater food comfort value, but schema was not related, $R^2 = .02$, $F(2, 129) = 1.77$, $p = .18$. Less value in food comfort and less money spent on food marginally predicted more times added salt, sugar, or butter to foods, $b = -.006$, $SE = .03$, $t(118) = -1.77$, $p = .08$, and $b = -.009$, $SE = .05$, $t(118) = -1.73$, $p = .09$, respectively. However, value in food comfort did not predict other food behaviors, such as fast food purchases, reading nutrition labels, cooking a nutritious meal, consumption of fruits and vegetables, sugar-sweetened beverages, or processed meats. From these results, regardless of demographics, perceived stress, and eating competency, the more money spent on food predicted more value in foods that help low-income individuals relieve stress and feel good about nutrition attitudes and schema. Thus, expendable income could shape their emotional response from food. The unappealing or repetitive nature of food served could also blunt perceived comfort from food and increase reason to enhance food flavor with additives (promoting poor health), so shelters should enhance food quality and assess emotional responses from food.

339) Abstract 1237

SUBJECTIVE SOCIAL STATUS MAY IMPACT THE EATING BEHAVIORS OF SOCIOECONOMICALLY DISADVANTAGED GROUPS

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Socioeconomic disadvantage is associated with unhealthy eating patterns, but what is still unknown are the psychological mechanisms that might explain this relationship. Accordingly, we hypothesized that subjective social status mediates the relationship between cumulative disadvantage and stress-induced eating behaviors. The sample ($n = 3,936$) was derived from two waves of the nationally representative

Midlife in the United States study. Results supported the mediational hypothesis: higher cumulative disadvantage (financial difficulties, less education, poverty; Gruenewald et al., 2012) at baseline significantly predicted lower subjective social status 10 years later ($b = 0.10$, $SE = 0.01$, $p < 0.0001$), which in turn predicted stress-induced eating behaviors ($b = 0.07$, $SE = 0.02$, $p < 0.0001$). Bootstrapped estimates indicated a significant indirect effect ($b = 0.007$, $SE = 0.003$, 95% CI 0.003, 0.012). This is the first study to our knowledge that will test the mediating effect of subjective social status on the relationship between socioeconomic disadvantage and unhealthy eating.

340) Abstract 1761

TAILORING A CULTURALLY EFFECTIVE COMMUNICATION MODEL FOR PEDIATRIC HEALTHCARE PROVIDERS

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Previous studies conducted by our center have demonstrated that Mexican American children undergoing surgery are at increased risk for developing preoperative anxiety and postoperative pain. In order to address this issue, we developed and published on a community based participatory research (CBPR) process in which we partnered with the Mexican American community and identified cultural values that impacted the perioperative experience that were not previously addressed in the medical setting. For example, the concepts of *simpatia* (engaged social interactions as well as avoiding overt conflict) and *familismo* (dedication, loyalty to family) were identified, and the need for an intervention directed at the healthcare provider to improve culturally competency was articulated. The purpose of this abstract is to describe the process of developing and implementing the intervention.

As a first step, we conducted a thorough literature review and identified an existing intervention that was aimed to improve communication with patients of different cultural and class backgrounds, and address disparities in patient-provider interactions (RESPECT). RESPECT stands for respect, explanatory model, social context, power, empathy, concerns, and trust/therapeutic alliance. This model has been used in a number of settings in which sub-optimal communication was identified as a major barrier. We next established an advisory board that included national experts to adapt the intervention to Latino patients in the pediatric surgical settings (s-RESPECT) and includes training in both *simpatia* and *familismo*. Training in the s-RESPECT lasts 1-hour to be followed by 2 booster sessions at 3 and 6 months; the relative simplicity of s-RESPECT is crucial to assure use in clinical settings. s-RESPECT includes a didactic portion followed by role-play activities such that providers can implement, and practice strategies covered in the training. Interviews following the training showed that providers were receptive to the program and appreciated the opportunity to incorporate components to improve cultural competency, suggesting feasibility of such an intervention to reduce disparities in perioperative outcomes in Latino children and their families.

341) Abstract 1486

COMMUNITY VIOLENCE EXPOSURE AND STRESS REACTIVITY IN AFRICAN AMERICAN AND NON-LATINO WHITE ADOLESCENTS WITH OVERWEIGHT/OBESITY

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Purpose: The purpose of this study was to examine the relationship between community violence exposure and reactivity to a laboratory stressor in African American and non-Latino white adolescents with overweight/obesity. **Methods:** Fifty-one adolescents (47% female, 55% African American; ages 14-19 years) participated in this study. Community violence was assessed using the Survey of Children's Exposure to Community Violence. Stress reactivity was assessed via salivary cortisol and alpha amylase area under the curve (AUC) during a Trier Social Stress Test (TSST). **Results:** For participants with no exposure to community violence, a significantly higher alpha-amylase AUC was observed for African American adolescents compared to white adolescents ($\beta = -10375 \pm 3759$, $p = 0.01$). However, African Americans demonstrated a significant decline in alpha-amylase AUC ($\beta = -5227 \pm 1741$, $p = 0.005$) while non-Latino whites demonstrated a significant increase in alpha-amylase AUC ($\beta = 3626 \pm 1244$, $p = 0.007$) at similar increases in violence exposure. There were no significant differences in the relationship between community violence exposure and cortisol AUC by race (all p 's > 0.05). **Conclusion:** Racial differences in the relationship between community violence exposure and alpha-amylase reactivity during a TSST may have important implications for long-term cardiometabolic disease risk in African American adolescents with overweight/obesity. Longitudinal studies are needed to better understand the mechanisms by which community violence exposure differentially impacts stress reactivity by race.

342) Abstract 1271

DISCRIMINATION AND MENTAL HEALTH AMONG LATINX WOMEN: THE ROLE OF FAMILY SUPPORT AND PARENT/ CAREGIVER STATUS

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Introduction. Research has revealed that discrimination is detrimental to the mental health of Latinxs. However, discrimination does not affect all individuals in the same way and not all individuals benefit from the same protective factors. For example, family support may serve as a buffer against the health effects related to discrimination. Being a parent or caregiver is one aspect of family support, and it has an important role in the lives of Latinx women. Thus, parent /caregiver status may influence perceptions of discrimination and mental health among Latinx women. The first aim of this study was to examine whether the relationship between discrimination and mental health among Latinx women varies by parent/caregiver status (i.e., whether or not women had children). The second aim was to assess the influence of family support on the relationship between discrimination and self-reported mental health among those who were parents/caregivers and those who were not. **Methods.** This study used data from the Latina subsample ($N = 1427$) of the *National Latino and Asian American Study*. The following variables were assessed: Discrimination (*Everyday Discrimination Scale*; Williams et al., 1997), self-reported mental health, family support [via items that assessed the frequency and ability to rely on support from their family (Kessler et al., 2003)], parent/ caregiver status (via responses to the number of children that they had; 0 = not a parent/caregiver; 1 or more = parent/caregiver). **Results.** Higher levels of discrimination predicted worse mental health for parents/caregivers ($B = -.02$, $SE = .01$, $p < .05$). This relationship was not significant for women who were not parents/caregivers. Family support was positively related to mental health among all women regardless of parent/caregiver status. Family support did not moderate the relationship between discrimination and mental health among either parents/caregivers or those who were not parents/

caregivers. Results also revealed that there was a significant interaction between discrimination and family support for women who reported that they had one or two children ($B = -.004$, $SE = .002$, $p < .05$), but not among those who had three or more children. **Discussion.** Findings have implications for future interventions as they suggest that discrimination and family support may differ as a function of parent/caregiver status.

343) Abstract 1596

THE ASSOCIATION OF SOCIOECONOMIC STATUS IN CHILDHOOD AND ADULTHOOD ON BLOOD PRESSURE REACTIVITY IN THE TRIER SOCIAL STRESS TEST

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Childhood trauma and stress has been associated with decreased health and the development of chronic diseases as an adult. This study investigates the association between perceived childhood socioeconomic status (SES) and physiological responses to the Trier Social Stress Test (TSST). We hypothesized that participants who reported both a low childhood SES and low adulthood SES would have the greatest blood pressure response to the TSST. Eighty-five participants (mean age=33.89 years, 63.1% female) took part in this task. Before the task began, a baseline blood pressure was measured every 90 seconds over 6 minutes. During the TSST, blood pressure was measured again every 90 seconds throughout the 6 minute task. Participants also answered questions about their perceived SES in adulthood and in childhood. Blood pressure reactivity was calculated as the difference between diastolic and systolic blood pressure during the TSST minus baseline diastolic and systolic blood pressure, respectively. Results showed significant correlations between higher diastolic blood pressure reactivity and a number of SES indicators including lower average child and adulthood wealth ($r = -.268$, $p < .014$), worry about not being able to pay bills as an adult ($r = -.220$, $p < .045$), and lower average adult wealth ($r = -.244$, $p < .025$). There was also a correlation between a higher reactivity for both diastolic and systolic blood pressure averages and reporting growing up in a relatively less wealthy neighborhood (diastolic: $r = -.272$, $p < .012$, systolic: $r = -.231$, $p < .035$). After controlling for possible confounding variables related to SES and cardiovascular function (i.e., alcohol use, exercise, smoking habits, age, and sex), these associations were no longer present, primarily due to the effects of exercise. These results support past work on the harms of low SES on stress and health. Specifically this shows that a range of perceived lower socioeconomic status indicators both in childhood and as an adult are tied to higher blood pressure when exposed to a new social stressor, but also indicates that differences in physical activity may be an important reason for this effect.

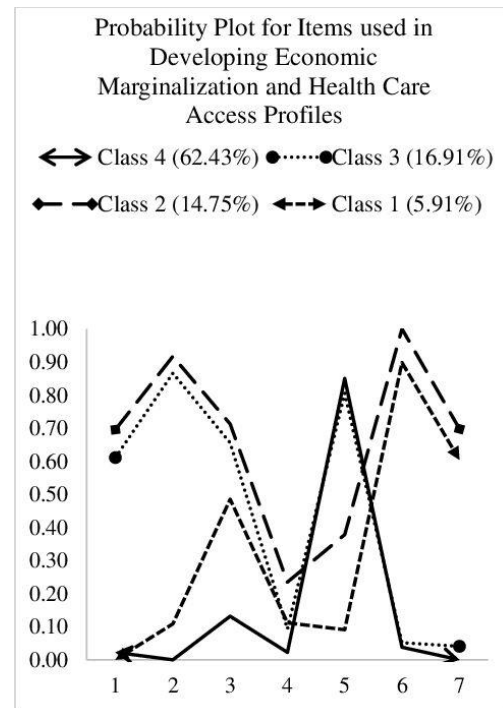
344) Abstract 1735

ASSOCIATIONS AMONG ECONOMIC MARGINALIZATION, HEALTH CARE ACCESS, AND SELF-REPORTED HEALTH: A LATENT CLASS ANALYSIS

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Objective: While the relationship between economic marginalization and adverse mental and physical health outcomes is evident, our understanding of this pathway is limited by measurement of few economic indicators within studies and varied economic indicators across studies. Person-centered analyses offer a unique statistical approach to describe the intersectional nature of economic indicators in relation to health. This study employed a latent class analysis (LCA) to explore taxonomies of economic marginalization and health care

access among a sample of adults. Self-reported health outcomes associated with the profiles were also examined. **Method:** Participants included 309 adults (ages 18 to 72; 53.4% female; 77.3% White) who completed an online survey via Mechanical Turk. Seven dichotomous items measuring food insecurity, housing instability, and health care access were used to develop taxonomies. Demographic variables, well-being (World Health Organization-Five Well-Being Index), self-reported health (Short-Form Health Survey), and body mass index (BMI) were assessed. **Results:** Class enumeration demonstrated good fit for a 4-profile model: varying economic stability with health care (5.91%), economic marginalization without health care (14.75%), economic marginalization with health care (16.91%), and economic stability with health care (62.43%). Wald chi-square tests indicated differences among the profiles on self-reported health outcomes ($ps < 0.05$). Profiles characterized by economic marginalization, regardless of health care status, reported lower well-being ($ps < 0.001$) and poorer self-rated health ($ps < 0.001$) than profiles with economic stability. Profiles characterized by economic marginalization with health care reported greater BMI than profiles characterized by economic stability with health care ($p < 0.05$). **Conclusion:** These data demonstrate that economic indicators intersect with health care access to reflect unique economic experiences which correspond to self-reported health outcomes. These findings underscore the impact of food insecurity and housing instability on self-reported health, despite access to health care services. LCAs offer a meaningful way to describe profiles of economic marginalization and their relationship with health. Consideration of these profiles in the context of interventions promoting health equity are warranted.



1. The food that (I/we) bought just didn't last and, (I/we) didn't have money to get more.
2. (I/we) couldn't afford to eat balance meals.
3. Have you had trouble paying rent, mortgage, or utility bills in the past year?
4. Have you had to move in with family or friends Because you had no other choice?
5. Do you have a usual medical provider to go to when sick?
6. Do you experience a delay in obtaining healthcare?
7. Do you experience a delay in obtaining prescription medication?

345) Abstract 1467

FEASIBILITY, ACCEPTABILITY, AND POTENTIAL IMPACT OF MINDFULNESS-BASED STRESS REDUCTION IN OLDER ADULTS AT RISK FOR CORONARY ARTERY DISEASE: A PILOT RANDOMIZED TRIAL

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Background: Stress influences metabolic activity and increases risk for cardiovascular disease (CVD). Little is known regarding the feasibility, acceptability, and impact of stress reduction in older adults at risk for CVD.

Purpose: a) To examine feasibility and acceptability of mindfulness-based stress reduction (MBSR) in older adults at risk for CVD, and b) obtain preliminary data on the metabolic impact of MBSR.

Method: A pilot RCT was conducted using a pre-post and 2-month follow-up design. Eighty-one individuals who met criteria for metabolic syndrome and exhibited non-normative responses to stress in a previous investigation were invited to participate. Participants were randomized (by sex and stress response) to a 9-week MBSR or a wait-list control group. Feasibility was assessed via response and recruitment rates; acceptability via program attendance, completion rate, and questionnaire. Metabolic parameters were measured repeatedly.

Results: Thirty-three individuals (41%) responded to the invitations, of whom 26 (79%) were eligible and consented. Completion rate of MBSR was 68% and overall attendance was 97 %. Reported benefits of MBSR included increased relaxation, greater connection with loved ones, and increased body awareness. MBSR led to a decrease of 15% in LDL and 10% in cholesterol versus 4.5% and 1%, respectively in the waitlist. Within group analyses showed notable decreases in LDL, triglycerides, and waist circumference ($\eta^2=0.15-0.39$) post-MBSR and 2 months later.

Conclusion: A RCT was largely feasible and MBSR acceptable to participants. Preliminary evidence suggests that MBSR may lead to sustained decreases in cholesterol levels, warranting development of further large-scale research on this topic.

Key Words: MBSR, Stress, Acceptability, Feasibility, Metabolic Syndrome, Cholesterol, Autonomic

346) Abstract 1898

A COGNITIVE REHABILITATION PROGRAM FOR COMMUNITY-DWELLING SURVIVORS OF TRAUMATIC BRAIN INJURY

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TBI is a complex physical injury that has the capacity to significantly impair survivors' functioning in areas of cognitive abilities, physical functioning, behavioral disorders, and emotional disturbances. These symptoms can be temporary or permanent and cause partial or total functional disability or psychosocial maladjustment. Survivors of TBI with psychiatric and cognitive symptoms may have unique challenges post-injury since these domains are reflexive. The current study assessed a 12-week group cognitive rehabilitation program that incorporated affective symptom assessment, neuropsychology, rehabilitation psychology, and group process dynamics found in traditional group psychotherapy to assist community-dwelling survivors in reintegrating into their preinjury community roles.

Twelve community-dwelling survivors whose ages ranged from 21 to 70 ($M=40.25, SD=17.21$; 50% female; 75% European American) participated in a 12-week cognitive rehabilitation program that involved interactive lectures to teach compensatory memory strategies and assessments to further understand deficits. Subjects were assessed the Repeatable Battery for Neuropsychological Assessment (RBANS) before and after the program, and negative mood regulation (NMR),

the ability to maintain level-headedness in the presence of strong negative emotion. The sequelae that result from TBI are largely affective and cognitive complaints, yet the relationships between the symptom clusters are not well understood, hence the reason for NMR assessment.

Participants demonstrated significant improvements in the RBANS domains of Immediate memory, $t(11) = -4.88, p < .001$, and Delayed memory, $t(11) = -3.27, p = .007$, but not in Visuospatial/Constructional Memory ($p = .038$), Language ($p = .024$), or Attention (.730). However, controlling for NMR revealed marginally significant improvement in Attention, $F(1, 9) = 5.70, p = .041$. Indeed, the most frequent complaint from participants pertained to mood and emotional disturbances.

Findings provide preliminary support for cognitive rehabilitation to improve postinjury functioning in TBIR survivors while also highlighting that the physical insult of TBI facilitates symptomology that can be considered affective and cognitive in nature which contributes to the quality of life in survivors.

347) Abstract 1703

IMPLEMENTING A CONSCIOUSLY RESTING MEDITATION PROGRAM IN HIGHER EDUCATION

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Background: Between 2009-2014, students learned Consciously Rest Meditation (CRM) from trained teachers at Georgia State University, in Atlanta Georgia. CRM is a sound-based, simple, natural mental technique practiced sitting quietly with eyes closed.

Methods: Students learned CRM in Freshman classrooms in two 50-minute sessions one week apart. After CRM training, students participated in a 20-minute CRM practice and surveyed after their first meditation. Students were given a "Home-Rest" assignment to practice CRM twice daily for 20-minutes for one-week. In the second CRM session, students completed a follow-up survey.

Results: Of the 2,610 students who participated, 93% indicated CRM was easy to learn, 93% indicated CRM was peaceful and 95% reported it was pleasant. Before the initial CRM practice, 85% reported they were "neutral to very stressed". After the 20-minute CRM practice, 25% reported they were "neutral to very stressed" ($p < .001$). When asked "Will you practice CRM for 20 minutes in the morning and evening until the next session?", 77% indicated "Yes", 4% indicated "No" and 19% "Did not know". One week later, at the beginning of each class, 2,126 students were administered a follow-up survey. The number of meditations reported was 62% < 5 individual meditations and 48% > 5 individual meditations. The number of minutes practicing CRM was 65% < 10 minutes and 25% > 10 minutes. The survey reported 75% of the student's breathing slowed down. When asked about sleep quality, 36% reported improvements. In addition, 64% reported noticing an increase in their "clarity of mind". When asked, "How do you feel today compared to last week?", "feeling excellent" increased from 114 students for the previous week to 271 students for current week and "feeling miserable" decreased from 121 students in the previous week to 80 students in the current week ($p < .001$).

Conclusion: Implementing a CRM program in higher education classrooms requires little more than skilled meditation instructors and the willingness to do so by administrators and faculty. Students did not self-select, the teachers selected for them. Since student's ID's were used, future studies of this cohort could assess if there are long-term benefits of CRM. Based on the finding of this study, the implementation of CRM in freshman classrooms is warranted.

348) Abstract 1681

SUPPORTING WELL-BEING AMONG SURVIVORS OF INTIMATE PARTNER VIOLENCE: A QUALITATIVE STUDY

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The purpose of this study was to investigate the needs of survivors of Intimate Partner Violence (IPV) as well as socioeconomic disparities in needs and access to services. Women who have experienced IPV have particular susceptibility to adverse physical and psychological well-being outcomes (Campbell & Lewandowski, 1997; Plichta, 1996; Yim & Kofman, 2018). Studies suggest that participation in therapy (Rhoads, 2015) and empowerment programs (Garcia, Stoeve, Wang, & Yim, 2019) that meet the survivors' needs can help ameliorate these negative outcomes. However, less research has qualitatively investigated the impact of a wider range of services, such as those addressing legal, housing, and other financial needs. Sociodemographic disparities in needs and services and their impact on well-being are also not well understood in this population. This study consisted of 19 participants that completed interviews. Preliminary qualitative findings provide insight into seven factors impacting women's needs after exposure to IPV and barriers to services. Common themes ranged from 1) struggles to pay bills, 2) the financial burden of legal fees, 3) feeling misunderstood in the legal system, 4) the need for access to services that specialize in cases of IPV, 5) help to overcome the effects of IPV on children, 6) perceived incongruences across services and 7) mistrust. These preliminary findings suggest that a holistic approach to addressing survivor needs might set the stage for a healthier recovery trajectory.

349) Abstract 1526

INDIVIDUAL AND ORGANIZATIONAL PREDICTORS OF MENTAL HEALTH AMONG HOSPITAL NURSES EXPOSED TO WORKPLACE BULLYING

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Workplace bullying is pervasive in the nursing profession, although the reasons for this are not well understood. Bullying is a form of mistreatment that entails persistent and deliberate negative actions directed towards an individual. Bullying occurs repeatedly over time and contributes to nurse burnout and turnover. A better understanding of factors contributing to bullying behaviors and their impacts on nurses' mental health is critical to the development of effective interventions to prevent these behaviors and to mitigate their negative consequences. This study aimed to identify individual and organizational predictors of mental health outcomes in a sample of hospital nurses exposed to bullying. A cross-sectional, web-based, anonymous questionnaire was administered in 2017 to all registered nurses in a regional healthcare system in the United States (n=1780), with 331 complete responses. A dichotomous variable (yes/no) was used to measure exposure to bullying at work in the past 6 months. Validated scales were used to measure mental health and work-related exhaustion. Linear regression was used to identify individual and organizational factors associated with mental health outcomes among bullied as compared to non-bullied nurses. Over one-third of respondents (36.9%, n=122) reported having been bullied at work in the last 6 months. Compared to non-bullied nurses, nurses who were bullied had lower scores on mental energy (42.37 vs. 59.97, $p<.001$) and higher scores on work-related exhaustion (74.18 vs. 57.93, $p<.001$). Stress was inversely associated with mental energy among both bullied and non-bullied nurses. Work satisfaction positively

predicted mental energy among non-bullied nurses, while psychological safety was the only organizational predictor, and only among nurses who had been bullied. Individual predictors of work-related exhaustion were stress and work satisfaction in both bullied and non-bullied nurses. Job performance and psychological safety positively predicted exhaustion among bullied nurses. Bullying victims had poorer mental health than nurses who were not bullied. Psychological safety, a measure of team trust and respect, emerged as a significant determinant of mental health among nurses exposed to bullying. Interventions to reduce bullying among nurses should focus on improving psychological safety among unit teams.

350) Abstract 1462

PAIN, POST-TRAUMATIC STRESS DISORDER AND DEPRESSION IN TRAUMA-EXPOSED REFUGEES: THE POSSIBLE PROGNOSTIC ROLE OF C-REACTIVE PROTEIN

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It is well established that post-traumatic stress disorders (PTSD), depression, and pain are common sequela in war-exposed refugees. Pre-displacement trauma exposure and poor acculturation i.e. assimilation and integration into the host country have been purported to be associated with these disorders. However, there are few prospective studies that follow refugees over time with both clinical and self-rated mental health assessment along with biomarker data to determine possible pathophysiological mechanisms. This study examined how the pro-inflammatory biomarker C-Reactive protein (CRP) predicted scores on an aggregated scale measuring: PTSD and pain, as well as the scores on the separate depression scale over time in newly arrived Iraqi refugees to the US.

A sample of 48 refugees responded to a survey within 1 month of arrival (T1) and 2-years after arrival (T3). Clinical interviews and validated scales measured pre-displacement trauma, acculturation, PTSD and depression. Participants' ratings of physician-diagnosed pain disorders (headache, arthritis and muscles or tendons disease) were summed to create the pain index. The scores on PTSD and pain index were summed to create an aggregate score. Blood samples were collected 1 year after arrival (T2) and analyzed for serum CRP. Linear regressions were used to determine the predictive value of CRP for aggregate PTSD and pain scores as well as depression scores at T3.

Analysis showed that CRP (standardized $\beta = 0.36$; $p<0.05$) and acculturation ($\beta = -0.30$; $p<0.05$) predicted aggregate PTSD and pain at T3, controlling for age, pre-displacement trauma, and baseline scores of the outcome measures. Furthermore, CRP ($\beta = 0.51$; $p<0.001$) and acculturation ($\beta = -0.25$; $p<0.05$) predicted depression at T3 after controlling for age and baseline depression.

This study suggests that malleable factors in the post-displacement environment facing refugees, specifically acculturation to the host country, as well as activation of the inflammatory system influence post-displacement health, independently from pre-displacement trauma. It is suggested that greater attention should be paid to identifying and treating refugees at high risk to develop post-trauma disorders.

The study was approved by Wayne State University Institutional review board. This research was supported by grants from NIMH/NIH R01MH085793 and NIEHS/NIH P30ES020957.

351) Abstract 1630

COGNITIVE-BEHAVIORAL THERAPY FOR PANIC DISORDER IN PATIENTS WITH COMORBID CORONARY HEART DISEASE: PRELIMINARY RESULTS OF AN ADAPTED INTERVENTION

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Introduction: Panic disorder (PD) is one of the most prevalent psychiatric disorders in patients with coronary heart disease (CHD). The first-line treatment for PD, cognitive-behavioral therapy (CBT), may be challenging in cardiac patients, notably due to the potentially similar clinical presentation of both conditions. However, to date, only one study has investigated the treatment of PD in patients with CHD. Based on clinical experience and the literature, our team adapted a validated CBT protocol for PD in order to address the challenges posed by the presence of comorbid CHD. The main objective of this study is to obtain preliminary data on the effect of this intervention on PD severity, anxiety sensitivity, cardiac anxiety as well as anxiety and depression symptoms.

Method: Participants were recruited in an outpatient cardiology clinic. PD diagnoses were established using the Anxiety and Related Disorders Interview Schedule for DSM-5. Patients also completed questionnaires pre and post treatment assessing the severity of PD, cardiac anxiety, anxiety sensitivity, as well as anxiety and depressive symptoms. The manualized and standardized CBT protocol was delivered during 14 to 17 weeks, 1 hour per week. Changes in main outcomes were evaluated with changes scores between pre-treatment and post-treatment scores.

Results: Patients were 2 men and 1 woman, aged between 45 and 58 years old. They received 14, 17 and 14 sessions of adapted CBT, respectively. All of them had stable CHD, PD and at least one comorbid mood/anxiety disorder before treatment. At post-treatment, all 3 patients were in remission from PD and all comorbid disorders. Results indicate a reduction in the scores of the Cardiac Anxiety Questionnaire (changes scores: -2,-9,-34), the Anxiety Sensitivity Index-3 (-8,-15,-28) and the Panic and Agoraphobia Scale (PD severity measure; -18,-20,-21). A reduction in anxiety symptoms, as measured with the GAD-7, was observed in all patients (-6,-7,-18), while 2 out of 3 of them reported a decrease in depressive symptoms, as measured with the PHQ-9 (1,-3;-15).

Conclusion : These results seem to indicate that CBT can successfully be adapted in order to meet the particular needs of patients who present both PD and CHD.

352) Abstract 1635

CORTISOL AND ALPHA-AMYLASE RESPONSES TO A PSYCHOSOCIAL STRESS TEST IN GERMAN COMPARED TO NATIVE LANGUAGE

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Objective: Previous studies reported higher stress responses in association with experienced racial discrimination. This pilot study within the framework of the VIOLIN project (Verbal Violence in Institutions) focused, as a first step, on differences in cortisol and alpha-amylase responses to the Trier Social Stress Test (TSST) in Latin American immigrants in Germany depending on conducting the test in their native language Spanish or German. We further investigated the role of perceived discrimination in a foreign country for biological stress responses.

Method: Seventeen participants (52.9 % female) between the age of 19 and 36 years (mean = 26.9) from Latin America were tested (four in Spanish, 13 in German). Participants gave six saliva samples (-1, +1, +10, +20, +30, +45 min) and were randomized to a German or Spanish version of the TSST. Experienced discrimination was assessed using the Everyday Discrimination Scale (EDS).

Results: All participants showed significant cortisol and salivary alpha-amylase (sAA) responses to the TSST (cortisol: $F_{(3,48)} = 9.5, p < .001$; sAA: $F_{(5,80)} = 2.47, p = .04$). Nevertheless, no difference between conditions was found, neither for salivary cortisol concentrations ($t(15) = -1.14, p = n.s.$) nor for sAA ($t(15) = -2.5, p = n.s.$). Considering the German condition only, experienced discrimination significantly predicted the cortisol (but not sAA) response to stress ($\beta = 0.59, t = 2.41, p = .035, R^2 = 0.29$). Furthermore, almost every participant reported that either ancestry or national origin, race or physical appearance, were the assumed reason for experiencing discrimination.

Conclusion: Taken together, while no significant differences emerged between the two conditions in this preliminary data set, mean cortisol responses tended to be higher in the German TSST condition. We expect that with twice the sample size and equal cell distribution achieved in the near future, the study will be adequately powered to either confirm, or disprove the expected higher stress response in a stress situation experienced in a foreign language. Despite the preliminary character, we already found higher cortisol responses in those who perceived more discrimination. Future studies within the framework of VIOLIN will more deeply investigate the impact of verbal violence on stress responses in Germany.

353) Abstract 1700

CHRONIC STRESS, TARGETED REJECTION, AND ANTIBODY RESPONSE TO INFLUENZA VACCINATION IN ADOLESCENCE

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Chronic and acute stress are linked to poor physical health, and the presence of both may exacerbate their independent effects (Marin et al., 2009). Targeted rejection (TR; intentional rejection of an individual) is an acute stressor that has been linked to health and may be more toxic in particular contexts (Murphy et al., 2013). We explored whether the experience of a TR differentially influenced adolescent antibody response to vaccination in the context of chronic stress and protective factors.

Adolescents ($n = 148$) completed two study visits during the 2018-2019 influenza season (Table 1). At Visit 1, adolescents provided a blood sample, received the vaccine, completed questionnaires, and participated in an interview to assess past six month chronic and acute stress (the Life Stress Interview [LSI]; Adrian & Hammen, 1993). One month later, adolescents provided another blood sample. A Risk Index included standardized reports of negative relationships and poor mental health. An Asset Index included standardized reports of supportive relationships, school experiences, and coping. Coders identified TRs from the LSIs (86.7% agreement). Pre- and post-vaccination hemagglutination inhibition (HAI) antibody titers were assayed. Standard correction methods (Beyer et al., 2004) controlled for baseline antibodies.

Cluster analysis with the Risk and Asset composites yielded three clusters: "High Risk/Low Asset," "Average Risk/Asset," and "Low Risk/High Asset." Antibody production did not vary as a function of TR or cluster membership. However, analyses revealed a marginally significant $TR \times Risk/Asset$ Cluster interaction ($F[2, 142] = 2.96, p = .055$; Figure 1). For High Risk/Low Asset adolescents, those who disclosed a TR had less antibody production than High Risk/Low Asset adolescents without a TR ($M_{diff} = .63, p = .024$). High Risk/Low Asset adolescents without a TR had significantly greater antibody production than adolescents in the other groups ($M_{diffs} > .41, ps < .05$).

For adolescents at high risk across psychosocial domains, recent targeted rejection is associated with dampened post-vaccination antibody production. However, in the absence of that acute stressor, these high-risk adolescents demonstrate *greater* antibody production relative to low risk adolescents – a finding that challenges the notion that stress is associated with dampened adaptive immunity.

Table 1. Sample Demographics

	All Participants (n = 148)	
	M	SD
Age (years)	14.6	1.63
BMI (kg/cm ²)	22.3	5.39
	n	%
Gender		
Male	68	45.9
Female	80	54.1
Race/Ethnicity		
White	127	85.8
Non-White	21	14.2
Targeted Rejection		
No	117	79.1
Yes	31	20.9
Cluster Membership		
High Risk/Low Asset	33	22.3
Avg Risk/Avg Asset	48	32.4
Low Risk/High Asset	67	45.3

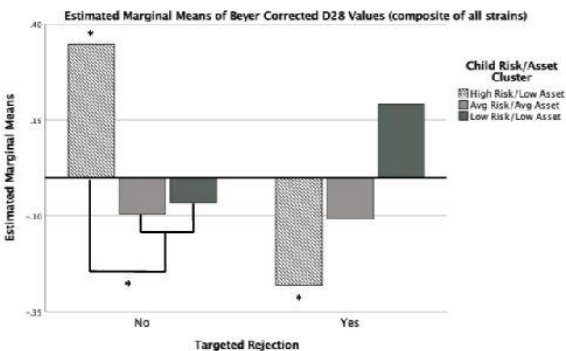


Figure 1. Corrected standardized mean composite of antibody response to the four 2018-2019 influenza vaccine strains as a function of TR and Risk/Asset cluster membership.

354) Abstract 1663

GLUCOCORTICOID RESISTANCE, LONELINESS, AND SOCIAL SUPPORT IN LONELY OLDER ADULTS

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Background: Loneliness and social isolation are robust risk factors for poor health and accelerated mortality. These chronic psychosocial threats are believed to dysregulate HPA axis activation, leading to glucocorticoid (GC) resistance in immune cells and thereby elevated systemic inflammation. This study explores the relationship between

social factors—specifically, loneliness and social support—and GC resistance in a sample at risk for inflammatory disease and premature mortality: lonely older adults. Loneliness was predicted to associate with greater GC resistance, and social support with greater GC sensitivity.

Methods: Subjects were a subset of lonely older adults (65-93 years; N = 89) recruited from a larger ongoing clinical trial. The UCLA Loneliness Scale was used to assess loneliness and the Interpersonal Support Evaluation List (ISEL) was used to assess social support. To determine GC resistance, whole blood was incubated with LPS and increasing concentrations of dexamethasone. Stimulated production of the proinflammatory cytokine, IL-6, was then assessed using ELISA. GC resistance was quantified by calculating the concentration of dexamethasone that reduced the stimulated IL-6 response by 50% (IC-50). A greater IC-50 indicated greater GC resistance. Linear regressions (controlling for age, sex, and race) related loneliness and social support with IC-50.

Results: Contrary to predictions, loneliness (N=89; β =0.114; p =0.296) and social support (N=81; β =-0.176; p =0.123) were not significantly associated with GC resistance. However, the direction of effects was consistent with predictions; loneliness tended to relate to greater GC resistance, and social support tended to relate to greater GC sensitivity.

Conclusions: Loneliness and social support were not associated with GC resistance in a sample of lonely older adults. However, the recruitment of a homogeneous, at-risk sample, may have prevented the detection of meaningful associations. Future analyses comparing older adults reporting high vs. low levels of loneliness are needed to better evaluate these relationships and determine whether GC resistance is a pathway linking social factors with inflammatory disease and early mortality.

355) Abstract 1633

BASELINE AUTONOMIC FUNCTION: RELEVANCE TO FIBROMYALGIA AND ME/CFS

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INTRODUCTION

Autonomic dysregulation is reported in patients with FM and/or ME/CFS. This study provides insight into the characterization of such autonomic dysregulation by comparing patients with FM and/or ME/CFS with healthy controls.

METHODS

Forty-nine patients with FM and/or ME/CFS assessed for the Rheumatology (ACR 2010) criteria, Canadian criteria and the 1994 Fukada criteria, were recruited for this study along with twenty healthy controls. Diastolic and Systolic Blood pressure (DBP and SDP respectively) and Heart rate (HR), were measured under a range of conditions including: a Valsalva manoeuvre, an arithmetic task, a hyperventilation task, deep breathing, and a standardised isometric

contraction. independent t-tests were used to investigate potential group differences. All results reported are significant at $p < .05$)

RESULTS

39 patients met ACR criteria, 46 met Canadian criteria, and all met the Fukada criteria.

Patients had a smaller HR rise 2 min after a Valsalva manoeuvre ($M = -.38$ bpm, SEM 5.17 bpm) compared to healthy controls ($M = -.378$ bpm, SEM 7.45 bpm).

During a cold pressor test, patients had a significantly smaller rise in SBP ($M = 7.07$ mmHg, SEM 9.96 mmHg) and DBP ($M = 3.69$ mmHg, SEM 4.51 mmHg) compared to healthy controls SBP ($M = 14.21$ mmHg, SEM 18.23 mmHg) and DBP ($M = 7.50$ mmHg, SEM 8.93 mmHg). In addition, patients had a significant drop in DBP during a hyperventilation task ($M = -0.52$ mmHg, SEM 6.48 mmHg) compared to healthy controls ($M = 5.09$ mmHg, SEM 7.8 mmHg).

Patients had a smaller rise in DBP during a standardised isometric contraction ($M = 3.07$, mmHg, SEM 6.57 mmHg) compared to HC ($M = 7.13$ mmHg, SEM 5.96 mmHg). In addition, patients had a smaller HR rise during the isometric contraction ($M = -0.77$ bpm, SEM 5.16 bpm) compared to healthy controls ($M = 3.95$ bpm, SEM 4.38 bpm).

DISCUSSION

Modest differences in blood pressure regulation and heart rate were observed between patients with FM and/or ME/CFS and healthy controls in response to a series of autonomic tests.

CONCLUSION

Autonomic tests including the Valsalva manoeuvre and the cold pressor tests are valuable methods to quantify autonomic dysfunction patients in with FM and/or ME/CFS. Ongoing work will link this data to symptom severity and how this might correlate with disease burden in these groups.

356) Abstract 1414

FEAR PROCESSING IN AUTISM: THE DYNAMIC RELATIONSHIP BETWEEN THE BRAIN AND THE HEART

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Background: Emotions can be guided by bodily physiology. Judgements of fear and neutral faces are differentially influenced by the cardiac cycle; increased fear ratings and increased amygdala activity to fearful faces and decreased intensity ratings to neutral faces presented at systole is observed. These effects correlate with individual differences in anxiety levels, suggesting a potential mechanism through which anxiety disorders are maintained. In autism, anxiety is one of the most common co-morbid symptoms. We therefore sought to understand the three-way relationship between autism, cardiac afferent activity and anxiety.

Methods: Participants with and without an autism diagnoses (36 autistic and 36 non-autistic controls) underwent fMRI during a cardiac-contingent emotional face paradigm. Fearful and neutral faces were presented at systole and diastole and participants subsequently rated facial emotional intensity. STAI-T, PHQ-9 and TAS-20 scores were measured. Behavioural data was analyzed using a 2 (group) x 2 (cardiac cycle) x 2 (emotion) between subjects ANOVA. For imaging data, a full factorial GLM was conducted testing for within and between group interactions. Affective symptomatology were modeled as covariates throughout.

Results: Preliminary results reveal all faces were rated as more intense at diastole ($t(87) = -4.210$, $p < 0.01$; mean dias 51.94, mean sys 49.57), with neutral faces more intense at diastole compared to systole ($t(87) = 7.342$, $p < 0.001$; mean dias 31.86, mean sys 27.05). Autistic participants rated neutral faces as more intense throughout ($t(86) = 2.305$, $p = 0.024$; mean autism 32.06, mean control 26.96). We found no relationship between anxiety and depression across all variables but did observe a significant interaction between emotion and alexithymia ($F(1, 70) = 49.028$, $p = 0.05$). In brain, we observed group differences

in regions involved in emotion (amygdala) and interoception (precuneus and cingulate cortex).

Conclusions: Our preliminary findings reveal no relationship between anxiety, emotion and cardiac cycle. Neuroimaging results suggest altered emotion and face processing in autism as well as differential brain activation during different phases of the cardiac cycle. Thus, our data suggests a possible mechanism through which aberrant interoceptive, and subsequent emotion processing, in autistic individuals may be maintained.







357) Abstract 1238

DIFFERENCES IN INTERNALIZED WEIGHT STIGMA BASED ON DISTRIBUTION OF EXCESS ADIPOSITY

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Background: Internalization of weight stigma (IWS) – or applying the negative stereotypes of overweight or obesity to oneself – is associated with poor mental health outcomes (e.g., depression) and with poorer weight loss. Differences in IWS based on estimated distribution of excess adiposity have not been investigated. **Method:** 201 female undergraduates ($M_{age} = 20 \pm 3$ years, $M_{BMI} = 26.2 \pm 6.9$ kg/m², 66% white) completed an online survey assessing IWS, BMI, and perceived shape/weight (i.e., fat distribution). IWS was measured with the Weight Bias Internalization Scale-Modified. BMI was self-reported as height and weight (kg/m²). Perceived shape/weight was assessed with six images representative of BMI categories by different excess fat distributions: average weight, overweight abdominal (OW_{AB}), overweight gluteofemoral (OW_{GF}), obese abdominal (OB_{AB}), obese gluteofemoral (OB_{GF}), or obese global. Participants selected the image that “best illustrates your own body size and shape.” A series of ANCOVAs were run to assess differences in IWS based on BMI and perceived shape or weight. Perceived shape was coded per fat distribution: 1) average weight image, 2) GF fat images (OW_{GF} or OB_{GF}), 3) AB fat images (OW_{AB}, OB_{AB}, or obese global). Perceived weight was coded per BMI category: 1) average weight image, 2) overweight images (OW_{GF} or OW_{AB}), 3) obese images (OB_{GF}, OB_{AB}, or obese global). BMI was coded as 1) average weight, 2) overweight, or 3) obese. BMI was controlled for in perceived shape and weight analyses. **Results:** Women who perceived themselves as having excess weight with mostly excess AB fat displayed greater levels of IWS ($M = 4.80 \pm .15$) than those with mostly GF excess adiposity ($M = 3.56 \pm .19$) or average weight ($M = 3.00 \pm .15$; $F(2, 189) = 6.90$, $p = .001$). Women who perceived themselves as overweight displayed greater levels of IWS ($M = 3.78 \pm .19$) than those of average weight ($M = 3.14 \pm .16$; $F(2, 189) = 4.34$, $p = .014$). Women with obese BMIs displayed greater levels of IWS ($M = 4.51 \pm .25$) than those with overweight ($M = 3.78 \pm .19$) or average weight BMIs ($M = 2.60 \pm .13$; $F(2, 207) = 29.22$, $p < .001$). **Conclusions:** Perceived shape is differentially related to IWS in women with excess weight, such that fat distributed around the abdomen is linked to higher internalization. Thus, fat distribution should be examined when exploring the negative effects of weight stigma.

Supplemental Table 1. Perceived Shape/Weight Stimuli and Associated Levels of Internalized Weight Stigma (IWS)

	Average Weight	Overweight		Obese		Global
		Gluteofemoral OW _{GF}	Abdominal OW _{AB}	Gluteofemoral OB _{GF}	Abdominal OB _{AB}	
	$n = 118$	$n = 52$	$n = 9$	$n = 16$	$n = 1$	$n = 4$
Image						
IWS $M \pm SD$	2.84 ± 1.46	3.70 ± 1.50	4.68 ± 1.34	3.73 ± 1.42	6.45 ± .00	5.95 ± .93

358) Abstract 1690**CUMULATIVE STRESS, INFLAMMATION, AND BODY MASS INDEX**

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Repeated activation of sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenal (HPA) axis due to high stress exposure can result in endothelial dysfunction and initiate an acute phase inflammatory response through the release of cytokines, acute phase proteins, and inflammatory mediators. Chronic inflammation can lead to an increase in body mass index (BMI) over time. However, few studies have tested the indirect effects of cumulative stress on BMI through inflammatory markers.

Using the Midlife in the United States Refresher sample, we conducted structural equation modeling to assess the association between a latent construct of cumulative stress, a latent construct of inflammation, and BMI. Eight domains of stress, including everyday discrimination, financial stress, and relationship problems, were used as indicators for the cumulative stress construct. Four inflammatory markers were used as indicators of the inflammation construct. The outcome BMI was self-reported height and weight.

Preliminary results reveal that the latent construct, inflammation significantly mediates the association between the latent construct of cumulative psychosocial stress and body mass index, explaining approximately 20% of the association. Further, of the total indirect effect due to inflammation, the largest proportion was due to CRP (13%), followed by IL-6 (3%), e-selectin (3%), fibrinogen (2%), and finally icam1 (<1%). The results presented herein offer preliminary evidence for possible interventions. However, further epidemiological research is needed to disentangle the precise mechanism linking stress and inflammation.

359) Abstract 1777**PROFILING BIOPSYCHOSOCIAL FACTORS ASSOCIATED WITH GLYCEMIC CONTROL IN TYPE 2 DIABETIC INPATIENTS IN SOUTHERN PUERTO RICO**

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Sociodemographic characteristics and mental illness are implicated in poor glycemic control among type 2 diabetics. However, the interrelations among these factors have not been well characterized among underserved populations impacted by Type 2 Diabetes, such as inhabitants of Southern Puerto Rico. The aim of this present study was to explore the association between biopsychosocial factors and glycated hemoglobin (HbA1c), a proxy of glycemic control, among a sample of inpatients with Type 2 Diabetes Mellitus (T2DM). A secondary data analysis was conducted on biopsychosocial variables obtained from 345 inpatients (53% female, mean age = 62.75 ± 14.88) admitted to a general hospital in the Southern region of Puerto Rico. All patients underwent psychological screening and evaluation from the Clinical Psychology Services Program of Ponce Health Sciences University between January 2015 and December 2017. Non-parametric inferential analyses were conducted to generate a profile of biopsychosocial factors related to glycemic control. Sixty-two percent (62.6%) of the sample exhibited poor glycemic control indexed by an average HbA1c of 8.18% (SD = 2.27). Age was inversely associated with glycemic control (r_s [345] = -.276, p = < .001). Furthermore, inpatients reporting lower household incomes were also more likely to evidence poorer glycemic control (X^2 (5) = 13.12, p = .022). Overall, inpatients meeting DSM-V diagnostic criteria for (a) co-occurring

depressive mental illness and (X^2 (132) = 175.37, p = .007) and (b) any recurring mental illness (X^2 (12) = 24.67, p = .016) were significantly more likely to have had a comorbid ICD-10 diagnosed cardiovascular disease. These results suggest biopsychosocial determinants of health play an integral role in glycemic control among inpatient Type 2 diabetics. Future studies exploring the mechanisms that uniquely link psychosocial determinants and glycemic control among hospitalized Type 2 diabetics are warranted.

Keywords: age, cardiovascular disease, depression, glycemic control, income, type 2 diabetes, *Puerto Rican inpatients*.

360) Abstract 1736**NATURALISTIC EXPRESSIONS AND PAIN: DO FACIAL EXPRESSIONS INFLUENCE PAIN TOLERANCE OR SELF-REPORTED PAIN?**

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What are the naturalistic expressions people make as they experience pain? While some research has shown that manipulating participants' facial muscles to form Duchenne smiles can improve the ability to tolerate pain (i.e., Kraft & Pressman, 2012), it is unclear whether this is characteristic of naturalistic pain experience. Further, it is unclear if other naturalistic expressions (e.g., wincing or frowning) can also influence pain. To our knowledge, research has yet to examine whether there is an association between natural facial expressions made during pain and pain outcomes, like self-reported pain and pain tolerance. Self-reported pain (how much pain one reports feeling on a 0-100 scale) and pain tolerance (how long one endures pain) were measured as outcomes in the present study. In the present study, 160 participants consented to being videotaped throughout a larger study on ethnicity and pain (77.8% women & 22.2% men; 57.5% Latino, 29.4% White, & 13.1 % Mixed) and participated in a standardized pain task, the cold pressor, where they were asked to submerge their non-dominant hand in cold water (5°C ± 0.2) for as long as they could tolerate (with a maximum of four minutes). Self-reported pain (how much pain one reports feeling on a 0-100 scale) and pain tolerance (how long one endures pain) were measured as outcomes in the present study. Coders rated Facial Expressiveness by measuring the duration and intensity that participants contracted their facial muscles (into smiles, frowns, etc.). Facial Expressiveness (regardless of the expression) was negatively associated with pain tolerance while stoicism was positively associated with pain tolerance (p 's < .05). Further, facial expressions were associated with self-reported pain (p 's < .05). In sum, pain tolerance and self-reported pain can be predicted, to some extent, by expressiveness.

361) Abstract 1910**USING A DIABETES SELF-MANAGEMENT APP TO INCREASE HEALTH LITERACY AND DIABETES SELF-MANAGEMENT: A PILOT STUDY**

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Background: Patients facing the threat of well-known chronic diseases like diabetes mellitus (DM) may encounter difficulties in a range of skills, from reading information written on drug packages to scheduling drug doses, reading and interpreting blood sugar values, comprehending informed consents, informational brochures and other materials. This is why poor health literacy skills cast serious threats to adherence to treatment plans and raise doubts regarding the level of real understanding of medical terms that patients consent with routinely.

Objective: We aimed to design a mobile nutrition literacy app and test the feasibility of its implementation as well as its usefulness in increasing health and nutritional literacy and the short-term self-management of disease in patients with diabetes.

Methods: 21 patients with Type 2 Diabetes Mellitus (T2DM) were recruited from an inpatient setting and agreed to use the newly developed app for 4 weeks. Pretest measures of diabetes and nutritional literacy, personal goals regarding the self-management of diabetes (nutritional, exercise- generated in partnership with their doctors), distress, anxiety, depression, attitudes and self-efficacy related to different aspects of self-care in diabetes were assessed at baseline in the in-patient setting. Participants were trained regarding various functions of the app (educational module; self-monitoring of carbohydrates, of physical activity, and of blood pressure; goal setting; treatment reminders). Post-test measures of the same constructs are scheduled to take place 4 weeks after the pre-test, over the phone (end February-beginning March). The main outcome measure will be the average glycated hemoglobin (4 weeks). In addition, we will assess for the perceived functionality, enjoyment and willingness to use the diabetes app in the future

Results: Participants aged between 37 and 62 years old have poor diabetes and nutritional literacy. Twelve (out of 21) did not know what carbohydrates were, whereas 9 patients considered that it was safe to drink fresh fruit juices in whatever quantities. All participants were enthusiastic about using the app and taking part at the study.

362) Abstract 1650 will not be published

363) Abstract 1887

PAIN INDICES DERIVED FROM MOMENTARY ASSESSMENTS PREDICT ASSAY SENSITIVITY IN PAIN CLINICAL TRIALS

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Background:

The ability to discriminate between effective and ineffective treatments (assay sensitivity) remains a highly important issue in pain clinical trials. Although many factors are known to affect assay sensitivity (e.g., sample size or patient characteristics), limited attention has been devoted to understanding whether characteristics of patients' baseline pain predict the detection of treatment effects. In this study, we tested whether or not a combination of baseline pain intensity, pain variability (individual standard deviation), and pain consistency (first-order autocorrelation) could discriminate groups of patients with different responses to placebo.

Methods:

In this secondary analysis, we used Ecological Momentary Assessment (EMA) data from two clinical trials (N=2084) that evaluated the effect of the antidepressant Milnacipran on fibromyalgia during 27 weeks of treatment. For each patient, three indices based on baseline measurements were computed: pain intensity level, pain variability, and pain consistency. A latent profile analysis (LPA) identified subgroups of patients based on the three indices. Treatment effects (changes in pain for active treatment versus placebo) in each subgroup were evaluated using repeated-measures ANOVA.

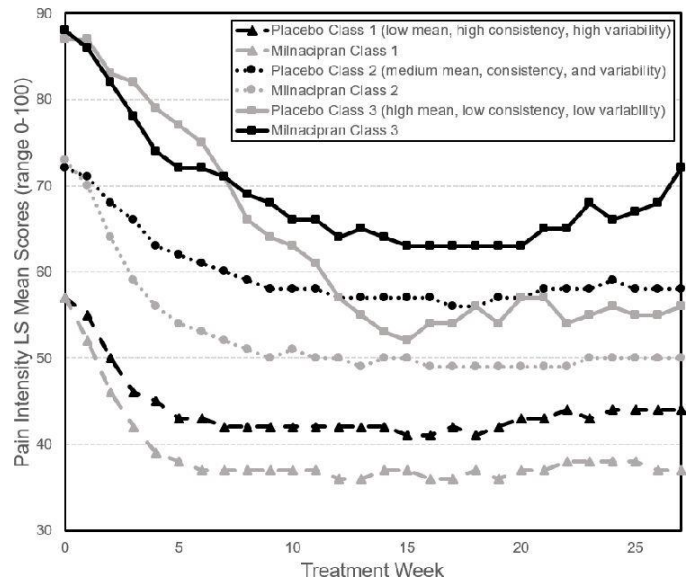
Results:

A LPA solution with 3 subgroups was most interpretable and had a sufficiently large sample size for further analysis in each group. Patients in group 1 (n=857, 41.3%) showed the lowest pain intensity levels, coupled with the highest consistency and greatest variability of pain. Group 3 (n=110, 5.3%) contained patients with a combination of high levels, low consistency, and low variability in pain. Patients in group 2 (n=1109, 41.3%) showed medium levels of all three indices. Treatment effects significantly differed between the three groups. Patients in group 3 demonstrated greater reduction in pain in response to placebo than those in groups 1 and 2. Further analysis showed that

the removal of patients in class 3 would enhance the observed treatment effect by 20%.

Conclusion:

Profiles of pain characteristics derived from baseline EMA can be useful for detecting patient subgroups who respond differentially to treatment. Inclusion of patients with high baseline pain intensity levels, low consistency, and low variability in pain may diminish assay sensitivity in pain clinical trials.



364) Abstract 1136

PEDIATRIC POSTOPERATIVE PAIN MEDICATION: CHILD SEX AND ETHNICITY INTERACT TO PREDICT PARENT MEDICATION ATTITUDES

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Over 85% of children experience significant pain after surgery. Despite this presence of pain, research suggests that a quarter of these children receive very little or even no pain medication at home. Such poor pain management in children can have harmful long-term consequences, both physically and psychologically. Previous research indicates that the amount of pain medication administered to children in the home may be significantly impacted by the beliefs and attitudes parents have regarding analgesics. Given this, the purpose of the present study is to identify how factors such as child sex and ethnicity are associated with certain parent analgesic attitudes or misconceptions. This study analyzes the association between these demographic predictors and medication attitudes among pediatric patients ages 2-13 who have undergone elective surgery at the Children's Hospital of Orange County (N = 112). Prior to surgery, parents completed surveys to report demographics and medication attitudes—fear of side effects, avoidance, and appropriate use attitude. Ethnicity was found to interact with child sex to predict parents' fear of side effects, $b = -4.750, p = 0.043$. Specifically, among Hispanic households, parents of daughters expressed a greater fear of side effects from analgesics compared to parents of sons. The opposite trend was seen in White households, such that parents of sons expressed a greater fear of side effects compared to parents of daughters. This sex difference in Hispanic families may be due to the phenomenon *machismo*, a term characterized by the hypermasculine idealization of men. Specifically, Hispanic parents may express a

significantly lower fear of side effects for their male children because they are encouraging their sons to be more stoic and “tough.” The hypermasculinity principles behind *machismo*, however, may not significantly transcend across other ethnic groups, as showcased by the opposite trend observed in White parents. Given the immense variability in content, amount, and clarity of information currently provided to parents about managing their child’s postoperative pain, these findings can be utilized to develop interventions that specifically target and educate parents who are likely to have misconceptions concerning analgesic use while still respecting the family’s culture, values, and practices.

365) Abstract 1138

PERSONALITY AS A RISK FACTOR FOR DEPRESSION AFTER THE DETECTION OF FETAL ANOMALIES

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Background:

The discovery of fetal anomalies causes acute distress to parents. Research on exposure to adversity suggests that there is significant heterogeneity in how individuals adapt to stressful life events. Whether such events are associated with future depression may in part depend on cognitive dimensions of personality.

Objective:

The purpose of this study was to examine if cognitive factors such as dysfunctional beliefs and health locus of control are risk factors for depressive symptoms among expectant mothers after detection of fetal anomalies. We also examined the impact of diagnostic severity and prognostic certainty on depression.

Method:

This study was part of the ongoing longitudinal SOFUS study. Participants were 94 pregnant women with a diagnosis of fetal anomaly, and 111 women with normal pregnancies. Data collection occurred four times between gestational age 18 weeks and 36 weeks. Hypotheses were tested using multiple regression analysis with depressive symptoms as the dependent variable.

Results:

Dysfunctional beliefs predicted symptoms among both groups at T1 (table 1). At T4 there was a significant group x dysfunctional beliefs interaction, such that dysfunctional beliefs predicted depressive symptoms only if the woman had received a diagnosis of fetal anomaly (table 2). External health locus of control predicted depressive symptoms at T1 (table 3), but not T4. There was no health locus of control x depression interaction, meaning that the effect of perceived control was similar for women with and without fetal anomalies. There was a non-significant positive association between diagnostic severity and depression ($B=2.45$, $SE=1.41$, 95% CI [-0.71, 5.72]). The control variables and severity accounted for 22.3% of variation in depression. Prognostic uncertainty predicted depression ($B=4.02$, $p<.01$, 95% CI [1.39, 6.87]). The control variables and uncertainty accounted for 20.1% of variation in depression.

Conclusion:

Our main finding is that dysfunctional beliefs and external health locus of control is positively associated with depressive symptoms following discovery of fetal anomalies. This can help identify women who may be more vulnerable to developing depression. Early counseling with a focus on challenging dysfunctional beliefs and increasing perceptions of control may reduce depression and support the health of both mother and child.

Table 1: Results from multiple regression analysis with group and dysfunctional beliefs as predictor variables, and depressive symptoms at T1 as the dependent variable.

Predictor	β	B	SE (B)	95% CI	R ²	ΔR^2
DAS-17						
Model 1					.55	
Group	-.64	-8.21**	0.79	[-10.14,-6.27]		
DAS-17	.25	0.14	0.03	[0.08,0.19]		
*Model 2					.55	.00
Group x DAS-17	-1.20	-0.22**	0.05	[-0.33,-0.07]		
DAS-17-P						
Model 1					.54	
Group	-.66	-8.38**	0.79	[-10.11,-6.51]		
DAS-17	.23	0.19**	0.04	[0.10,0.27]		
*Model 2					.54	.00
Group x DAS-17-P	-.02	-0.01	0.09	[-0.20,0.22]		
DAS-17-D						
Model 1					.52	
Group	-.63	-8.09**	0.81	[-9.86,-6.22]		
DAS-17	.20	0.23**	0.07	[0.09,0.38]		
*Model 2					.52	.00
Group x DAS-17-D	-.04	-0.03	0.13	[-0.31,0.28]		

N=190. DAS-17= Dysfunctional Attitudes Scale with 17 items. P= Perfectionism. D= Dependence. The model includes the control variables age, gestational age at inclusion, education, previous children, BMI before pregnancy, and smoking.

* Independent variables from model 1 are included in the model.

* $p<.05$, ** $p<.01$.

Table 2: Results from multiple regression analysis with group and dysfunctional beliefs as predictor variables, and depressive symptoms at T4 as the dependent variable.

Predictor	β	B	SE (B)	95% CI	R ²	ΔR^2
DAS-17						
Model 1					.17	
Group	-.28	-2.28**	0.69	[-3.85,-0.77]		
DAS-17	.15	0.05	0.03	[-0.003,0.10]		
*Model 2					.25	.08**
Group x DAS-17	-1.20	-0.22**	0.05	[-0.33,-0.07]		
DAS-17-P						
Model 1					.18	
Group	-.29	-2.32**	0.69	[-3.87,-0.84]		
DAS-17	.18	0.09	0.04	[0.01,0.17]		
*Model 2					.27	.09**
Group x DAS-17-P	-1.0	-0.33**	0.05	[-0.49,-0.11]		
DAS-17-D						
Model 1					.15	
Group	-.28	-2.26**	0.70	[-3.88,-0.75]		
DAS-17	.06	0.04	0.06	[-0.07,0.15]		
*Model 2					.17	.02
Group x DAS-17-D	-.55	-0.21	0.12	[-0.48,0.11]		

N=160. DAS-17= Dysfunctional Attitudes Scale with 17 items. P= Perfectionism. D= Dependence. The model includes the control variables age, gestational age at inclusion, education, previous children, BMI before pregnancy, and smoking.

* Independent variables from model 1 are included in the model.

* $p<.05$, ** $p<.01$.

Table 3: Results from multiple regression analysis with group and health locus of control as predictor variables, and depressive symptoms at T1 as the dependent variable.

Predictor	β	B	SE (B)	95% CI	R ²	ΔR^2
HLCS-I						
Model 1					.49	
Group	-.66	-8.41**	0.83	[-10.21,-6.52]		
HLCS-I	-.004	-0.01	0.08	[-0.14,0.15]		
*Model 2					.50	.01
Group x HLCS-I	.52	0.27	0.17	[-0.09,0.61]		
HLCS-EPO						
Model 1					.51	
Group	-.67	-8.54**	0.82	[-10.34,-6.63]		
HLCS-PO	.12	0.17*	0.07	[0.03,0.30]		
*Model 2					.51	.00
Group x HLCS-PO	-.28	-0.18	0.15	[-0.50,0.15]		
HLCS-EC						
Model 1					.51	
Group	-.65	-8.26**	0.82	[-10.08,-6.37]		
HLCS-C	.16	0.25**	0.09	[0.10,0.40]		
*Model 2					.52	.01
Group x HLCS-C	-.45	-0.31	0.17	[-0.68,0.10]		

N=160. HLCS= Health Locus of Control Scale. I= Internal. EPO= External Powerful Others. EC= External Chance. The model includes the control variables age, gestational age at inclusion, education, previous children, BMI before pregnancy, and smoking.

* Independent variables from model 1 are included in the model.

* $p<.05$, ** $p<.01$.

366) Abstract 1870

MATERNAL CHILDHOOD MALTREATMENT, LIFESTYLE FACTORS, AND IMMUNE ACTIVATION DURING PREGNANCY

Clare McCormack, PhD, Center for Science and Society, Vincenzo Lauriola, MS, Marisa Spann, PhD, Obianuju Berry, MD, Behavioral Medicine, Seonjoo Lee, PhD, Mailman school of Public Health, Anika Mitchell, BA, Obstetrics and Gynecology, Columbia University, New York, NY, Frances Champagne, PhD, Psychology, University of Texas, Austin, TX, Catherine Monk, PhD, Obstetrics and Gynecology, Columbia University, New York, NY

Objective:

Despite being posited as a mechanism by which trauma effects transmit across generations, associations between childhood adversity and perinatal immune activation has only been examined in a few studies. Furthermore, there is a gap in understanding of whether lifestyle factors in adulthood alter such associations. Our objective was to examine associations between childhood maltreatment (CM) and immune activation during pregnancy, and whether these associations are moderated by psychosocial and lifestyle factors.

Methods:

Healthy pregnant women (n=187) completed interviews about psychosocial factors, including CM using the Childhood Trauma Questionnaire (CTQ), and dietary recall. Interleukin-6 (IL-6) was assayed from blood samples. Linear regression models examined associations and interactions between CM, diet, mood, BMI, social support, and IL-6.

Results:

Neither IL-6 at T2 nor T3 was correlated with CM. The interaction between CM and depression was not significant in T2 or T3. Diet quality in T2 was associated with IL-6 in T2 ($b=0.01, p=0.02$). The interaction between diet quality and childhood maltreatment on IL-6 in T2 was also significant ($b=-0.01, p=0.01$): women with exposure to CM showed a negative association between diet and IL-6 in T2.

Conclusions: Contrary to expectations, history of CM was not associated with IL-6 in T2 or T3 of pregnancy, independently or in interaction with depression. This may be due to the high-functioning sample. Higher quality diet was associated with reduced inflammation for those with CM history. Further investigation of this could inform interventions targeting modifiable risk factors limiting intergenerational transmission of adversity.

Acknowledgments: Supported by NIMH 1R01MH092580-01A1.

367) Abstract 1904

MINDFULNESS TRAINING CAN CAUSE THE STRESS REDUCTION DURING PREGNANCY

Sergey Kiselev, Ph.D., Clinical Psychology, Ural Federal University, Ekaterinburg, Russian Federation

Introduction

Prenatal maternal stress is an important phenomenon. Evidence on this topic suggests that women who experience high stress during pregnancy are more likely to deliver preterm infants and infants at risk for neurodevelopmental disorders. The goal of this study was to reveal the influence of mindfulness training on stress during pregnancy.

Method

In the current study we included 21 women who participated in the mindfulness training during pregnancy. The control group included 21 women who were in the reading control condition during pregnancy. Women were eligible to participate if they were experiencing elevated levels of perceived stress or pregnancy-specific anxiety (PSA), as indicated by responses to the Perceived Stress Scale and the PSA scale on a screening questionnaire. Women enrolled between 12 and 26 weeks gestation were randomly assigned to either the mindfulness training or to the reading control condition. Effects of training were analyzed by means of an ANOVA with repeated measurements.

Results

ANOVA has revealed ($p<0.05$) that women in the mindfulness intervention experienced larger decreases from pre- to postintervention

in pregnancy-specific anxiety and pregnancy-related anxiety than participants in the reading control condition.

Conclusion

This pilot study suggests that mindfulness training during pregnancy may effectively reduce pregnancy-related anxiety. However, it is necessary to do further research on the impact of mindfulness training on stress reduction during pregnancy.

368) Abstract 1799

EFFECTS OF EXERCISE ON THE CORTISOL AWAKENING RESPONSE IN LOW-INCOME PREGNANT WOMEN

Jason M. Devera, B.A. to be received in 2020, Guido Urizar, Ph.D., Psychology, California State University, Long Beach, Long Beach, CA Lower levels of the cortisol awakening response (CAR), have been associated with a number of adverse health outcomes including increased cardiovascular disease risk and postpartum depression, particularly among low-income women. However, few studies have examined the impact of health behaviors, such as regular physical activity, on increasing the CAR in this population. The aim of the current study was to prospectively examine whether engaging in moderate-intensity physical activity was associated with a higher CAR among low-income women during pregnancy and early postpartum. One hundred low-income pregnant women self-reported the amount of moderate-intensity physical activity they engaged in during their first trimester of pregnancy and at three months postpartum and also provided two saliva samples at waking and 30 minutes after waking to calculate the CAR at each of those timepoints. Results showed that mothers showed significant increases in their moderate-intensity physical activity per day from approximately 33 minutes ($SD = 55$) during pregnancy to 54 minutes ($SD = 43$) at three months postpartum [$t(85) = -2.475, p<0.05$]. However, these physical activity levels were not significantly associated with CAR at either timepoint [pregnancy: $r(100) = .001, p = .990$; postpartum: $r(87) = -.015, p = .892$]. Additional experimental studies are needed to examine whether increased exercise during pregnancy and postpartum may affect levels of the CAR among low-income mothers.

369) Abstract 1567

TYPE D PERSONALITY, SOCIAL SUPPORT AND CARDIOVASCULAR REACTIVITY TO ACUTE PSYCHOLOGICAL STRESS

Adam O' Riordan, BA, Siobhán Howard, PhD, Stephen Gallagher, PhD, Department of Psychology, University of Limerick, Limerick, Ireland

Background: Type D personality has been consistently associated with adverse cardiovascular health, with atypical cardiovascular reactions to acute stress one potential underlying mechanism. The provision of social support and negative unsupportive feedback during exposure to acute stress has been noted to improve (supportive feedback) and exacerbate (negative unsupportive feedback) physiological responses. Thus, the current study aims to examine how such social support interventions may be used to improve/exacerbate the cardiovascular reactions to stress amongst Type D individuals. Furthermore, given the socially inhibited nature of Type D personality, the current study also aims to examine if the effect of this intervention varies depending on the source of the feedback statements (confederate vs. computerised text).

Methods: A sample of 292 undergraduate students were pre-screened for Type D personality using the DS14. Participants who were classified as Type D were invited to participate in the experiment. Participants completed a standardised cardiovascular reactivity protocol consisting of a baseline and an acute stressor phase (mental arithmetic task). Participants either received supportive, unsupportive or no feedback during the task, from either a confederate or from computerised text. Cardiovascular parameters including systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR)

were monitored throughout the procedure. Data collection is currently ongoing.

Expected results: It is expected that the supportive feedback will improve the cardiovascular reactions of Type D individuals and that negative unsupportive feedback will exacerbate their reactions. Furthermore, given the socially inhibited nature of Type D personality, it is expected that the effect of the support manipulation will vary depending on the source of the feedback statements. It is expected that Type D individuals will benefit most from social support feedback from computerised text and will exhibit the most atypical reactions to negative unsupportive feedback from a confederate.

Conclusions: The current study will elucidate how a social support intervention may be used to moderate the cardiovascular reactions of Type D individuals and will identify the conditions under which Type Ds will exhibit the most healthful and adverse cardiovascular reactions.

370) Abstract 1876

POSTTRAUMATIC STRESS AND PERITRAUMATIC DISSOCIATION ARE ASSOCIATED WITH BLOOD PRESSURE AND HEART RATE RECOVERY AFTER STRESS

Sharon Y. Lee, MS, Crystal L. Park, PhD, Psychological Sciences, Linda S. Pescatello, PhD, Kinesiology, University of Connecticut, Storrs, CT

Cardiovascular disease (CVD) disproportionately affects traumatized individuals, likely due to dysregulated cardiovascular responses to stress. In particular, cardiovascular recovery from stress is an important prognostic marker for CVD development. Studies have exclusively used trauma cues as stressors or focused on specific types of trauma, with few examining cardiovascular recovery from a non-trauma-related psychosocial stressor in a sample with diverse trauma histories. Further, research about the link between trauma and cardiovascular stress recovery has primarily focused on posttraumatic stress disorder (PTSD) symptoms, neglecting other pertinent trauma-related symptoms, such as peritraumatic dissociation (PTD). The present study tests whether PTSD and PTD symptoms are associated with slower recovery (i.e., less change over time), as measured by blood pressure and heart rate, in response to a lab-based stressor (modified Trier Social Stress Task). A community-based sample of 84 trauma-exposed adults (83% female; 68% White; age: $M=35.10$), with no history of serious mental illness or CVD, completed self-reported measures of PTSD and PTD symptoms. During a single study visit, systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) were measured every 2 minutes with an automated monitor during baseline resting, stressor, and recovery periods. Overall, higher PTSD symptoms were associated with slower SBP and DBP recovery from the stressor compared to baseline. At the beginning of the recovery period compared to baseline, SBP decreased by 0.18 mm Hg ($SE=.08$, $p<.05$) and DBP decreased by 0.16 mm Hg ($SE=.08$, $p<.05$) for each point higher on PTSD symptom severity. At the end of the recovery period compared to baseline, SBP decreased by 0.16 mm Hg ($SE=.06$, $p<.01$) and DBP decreased by 0.12 mm Hg ($SE=.06$, $p<.05$) for each point higher on PTSD symptom severity. In addition, at the end of the recovery period compared to baseline, HR decreased by 0.21 bpm ($SE=.10$, $p<.05$) for each point higher of PTD. Results demonstrate that both higher PTSD and PTD symptoms are associated with slower cardiovascular recovery following exposure to non-trauma-related stressors. Understanding associations shared by both PTSD and PTD symptoms with cardiovascular recovery from stress may inform the association between trauma exposure and CVD risk.

371) Abstract 1144

ARE THE BENEFITS OF SOCIAL SUPPORT FOR CARDIOVASCULAR HEALTH ONLY EVIDENT FOR INDIVIDUALS WITH SPECIFIC ATTACHMENT STYLES?

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Social relationships are beneficial for health, particularly for alleviating the damaging effects of acute psychological stress on cardiovascular reactivity (CVR). Though much previous research has focused on the impact of social support (the tangible or emotional support that these relationships provide) on CVR, few consider the role of attachment. It has recently been suggested, however, that negative perceptions of social support might undermine the benefits of support for health, particularly among insecurely attached individuals. Therefore, we aim to examine if the impact of social support on CVR varies across attachment styles.

Employing a standardized stress testing protocol, an experimental laboratory study is currently being conducted on a sample of healthy young adults. During this procedure, social support is manipulated (support vs. no support) across individuals with difficult attachment styles (secure, anxious, avoidant), as measured by Bartholomew and Horowitz's (1991) Relationship Questionnaire. Cardiovascular reactivity measures are continuously monitored using the Finometer Pro hemodynamic monitor during a baseline, acute stress exposure and recovery period.

We expect that there will be differences in perceptions of social support, and reactivity, across each attachment style. Specifically, we expect that those who are anxiously attached will benefit most from receiving support in the presence of a stressor (i.e., a more adaptive cardiovascular response) because of their amplified responses to threat and danger, and increased need for comfort and caring. In contrast, we expect that avoidantly attached individuals will show a maladaptive response when receiving support as they prefer to be independent or emotionally distant.

These findings will extend the literature on the social support-reactivity link, and potentially highlight the importance of attachment style for understanding the costs and benefits of social relationships for physiological health outcomes.

372) Abstract 1353

INTEGRATION OF PSYCHOTHERAPY AND BIOFEEDBACK IN TREATMENT RESISTANT CASES

Gershon T. Lazarus, Ph. D, Eugene K. Emory, Ph.D, Psychology, Emory University, Atlanta, GA

A series of case studies will be presented highlighting the use of an integrated psychotherapy and biofeedback approach. The case studies will focus on pathologies with developmental etiologies including, selective mutism, autism, and other neurodevelopmental disorders. The trajectory of each case will be discussed by integrating psychological/behavioral and physiological indices and linking these factors to "real-world" outcomes. Heart rate variability biofeedback, salivary cortisol, psychological self-reports, and behavioral observations (from clinician and parents) will be the primary indices of focus. The assessment and intervention tools were selected based on empirical research as well as ease of use within the context of a private practice, community clinic, or clinical research lab. The theoretical and practical applications of this integrated approach will be discussed from clinical and research standpoints.

373) Abstract 1547 will not be published

374) Abstract 1067

OXYTOCIN EFFECTS ON RESTING-STATE HEART RATE VARIABILITY IN WOMEN: MODERATION BY CHILDREARING EXPERIENCES

Dounya Schoormans, PhD, Willem Kop, PhD, Laura Kunst, Msc, Madelon Hendricx-Riem, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Netherlands

Oxytocin is known for its stress-reducing effects and has been associated with autonomic nervous system measures (ANS) involved in the stress response, such as heart rate variability (HRV). The current study examined the effects of intranasal oxytocin administration on HRV among healthy women during rest, taking into account the role of early childhood experiences. Participants were 173 women who received 24IU oxytocin ($n=87$) or a placebo ($n=86$) and had completed the Childhood Trauma Questionnaire and reported how often their mother used love withdrawal as an insensitive disciplinary strategy. Resting-state HRV was measured as RMSSD, high frequency (HF)-HRV, and low frequency (LF)-HRV. Results show that only among those with negative childrearing experiences, oxytocin reduced RMSSD and LF-HRV, reflecting parasympathetic withdrawal. No significant effects were observed for HF-HRV. These findings suggest that oxytocin plays a role in ANS regulation and that childrearing experiences may influence oxytocin effects on ANS-related stress regulating systems.

375) Abstract 1295

CARDIORESPIRATORY FITNESS AND THE RELATIONSHIP WITH PERCEIVED ANXIETY AND STRESS PRIOR TO AN ACUTE PSYCHOLOGICAL STRESS TASK

Alexandra T. Tyra, M.A., Department of Psychology and Neuroscience, Baylor University, Waco, TX, Sarah E. Williams, Ph.D., School of Sport, Exercise, and Rehabilitation Sciences, University of Birmingham, Birmingham, United Kingdom, Danielle A. Young, Psy.D., Annie T. Ginty, Ph.D., Department of Psychology and Neuroscience, Baylor University, Waco, TX

Background: Higher cardiorespiratory fitness (CRF) is associated with lower intensity of trait anxiety and state anxiety prior to an acute psychological stress task. Interpretations of state anxiety (i.e., whether it is harmful or helpful) have been shown to mediate this relationship, with higher CRF related to more positive interpretation of anxiety symptoms and subsequently lower anxiety intensity. Research has yet to examine whether CRF is related to other psychological variables prior to a stress task, such as self-report stress or physiological arousal, and whether the interpretation of these symptoms mediates the relationship between CRF and symptom intensity.

Aims: The goals of the current study were to (1) re-examine the relationship between CRF and intensity/interpretations of anxiety prior to an acute psychological stress task and (2) extend prior research by examining the relationships between CRF and intensity/interpretations of stress and physiological arousal.

Methods: Participants ($N = 116$, Mean (SD) age = 19.7 (0.80) years, 68% female, 64.7% Caucasian, 18% Hispanic) completed a 4-minute standardized acute laboratory stress task. Before the task, participants rated the intensity (1 = not at all, 7 = extremely) and interpretation (-3 = debilitating, +3 = facilitative) of cognitive anxiety, somatic anxiety, stress, and physiological arousal about the upcoming task. A validated standardized formula was utilized to calculate CRF.

Results: Higher CRF was associated with lower cognitive anxiety, somatic anxiety, stress, and physiological arousal, as well as more positive interpretations of these symptoms ($p's < .05$). Mediation analyses indicated that CRF had a significant indirect effect via interpretation of symptoms on the intensity of cognitive anxiety ($\beta = -.067$, CI = $-.129$ to $-.021$), stress ($\beta = -.060$, CI = $-.118$ to $-.014$), and physiological arousal ($\beta = -.039$, CI = $-.090$ to $-.002$), but not somatic anxiety.

Discussion: Higher CRF is indirectly associated with lower intensity of anxiety, stress, and physiological arousal experienced prior to stress through more positive interpretations of these symptoms. One possible

explanation is that individuals who are physically fit may be more accustomed to the physiological arousal experienced during exercise and thus more likely to interpret the similarly arousing symptoms of anxiety and stress as beneficial.

376) Abstract 1049

TRAIT GRATITUDE IS NOT RELATED TO PSYCHOLOGICAL OR CARDIOVASCULAR RESPONSES TO ACUTE PSYCHOLOGICAL RESPONSES: RESULTS FROM TWO INDEPENDENT STUDIES

Rebekka H. Anderson, B.S. expected 2020, Jo-Ann Tsang, Ph.D., Alexandra T. Tyra, M.A., Danielle A. Young, Psy.D., Department of Psychology and Neuroscience, Baylor University, Waco, TX, Sarah E. Williams, Ph.D., School of Sport, Exercise, and Rehabilitation Sciences, University of Birmingham, Birmingham, NA, United Kingdom, Annie T. Ginty, Ph.D., Department of Psychology and Neuroscience, Baylor University, Waco, TX

Background: Positive affect is associated with more adaptive responses to stress (i.e., reduced feelings of stressfulness, lower cardiovascular and inflammatory responses to stress). Few studies have examined the relationship between trait gratitude, a specific type of positive affect, with psychological and physiological responses to acute stress.

Aim/Hypothesis: To examine how psychological and physiological responses to acute stress relate to trait gratitude across two independent studies. It was hypothesized that higher trait gratitude would be related to reduced feelings of stressfulness and lower physiological responses to acute stress.

Study 1: One-hundred participants (age range = 18-22 years; 63.3% female; 64.2% Caucasian, 22.2% Hispanic) completed a: 10-minute baseline and a 10-minute acute stress task (Paced Auditory Serial Addition Task; PASAT). Systolic and diastolic blood pressures (SBP/DBP) and heart rate (HR) were measured every two minutes, and averages were created for each phase. Reactivity was calculated as stress-baseline. Participants completed the Gratitude Questionnaire (GQ-6) and rated levels of perceived stress before and after stress exposure. There were no significant relationships between self-reported trait gratitude and SBP, DBP, or HR reactivity ($p's > .05$) or trait gratitude and perceived stress before or after the task ($p's > .05$).

Study 2: A community sample of 70 participants (age range = 18-62 years; 77.1% female; 51.7% Caucasian, 18.3% Hispanic) completed a 10-minute baseline period, 10-minute PASAT, and a 4-minute cold pressor challenge. SBP, DBP, and HR were measured every two minutes and averages were created for each phase. Reactivity was calculated as stress-baseline. Participants also completed the GQ-6, and perceived stress was measured before and after each stress task. There were no significant relationships between trait gratitude and SBP, DBP, and HR reactivity to either task ($p's > .05$) or between trait gratitude and perceived stress at any time point ($p's > .05$).

Conclusions: Trait gratitude was not associated with psychological or physiological stress responses. However, since gratitude is directed at others, stress tasks involving interpersonal interactions may be more applicable. Gratitude may improve psychological and physiological stress responses only when participants are aware of feeling grateful.

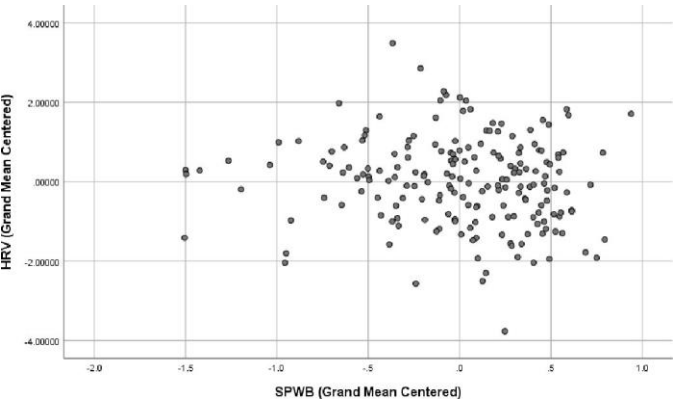
377) Abstract 1539

EUDAIMONIC WELL-BEING AND HEART RATE VARIABILITY AMONG MIDLIFE AND OLDER WOMEN

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Better cardiovascular health is critical for healthy aging and higher quality of life. Reduced cardiovascular risk—including stroke, heart attack, and cardiovascular death—has been correlated with higher positive psychological well-being. Heart Rate Variability (HRV) is

used as an index of the regulatory abilities of the parasympathetic nervous system: higher HRV is indicative of greater regulatory potential of the vagus nerve and better overall health. The current study hypothesized that experiencing higher eudaimonic well-being would correlate with higher levels of HRV in a sample of 194 older adult women (age 50–76 years). At baseline, ten-minute ECGs were recorded using a three-electrode arrangement to obtain $\ln(\text{HF Power})$ in the high frequency (HF) range: 0.15–0.40. The Scales of Psychological Well-being (SPWB) administered at baseline measured 6 facets of well-being including self-acceptance, positive relationships, autonomy, competence, purpose, and personal growth. Higher scores on SPWB denote greater eudaimonic well-being. Eudaimonic well-being was not a statistically significant predictor of HRV (unadjusted $\beta = -.08, p = .28$; adjusted for age and cardiorespiratory fitness $\beta = -.10, p = .16$). Cardiorespiratory fitness was a statistically significant correlate of HRV (adjusted $\beta = .30, p < .001$). This null result may challenge neurovisceral integration theory and provide support for dissociating HRV and psychosocial factors among older women. Among older adults, individual differences in cardiac health may overwhelm psychological contributions to HRV.



378) Abstract 1588
MOBILE HEALTH HEART RATE VARIABILITY BIOFEEDBACK AND CULTURE: STRESS RECOVERY THROUGH TRACKING SALIVARY ALPHA AMYLASE

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This research aims to assess whether there are cultural differences in the effectiveness of a mobile health application as an accessible and effective intervention to recover from acute stress. There is a research-to-practice gap of empirically validated stress interventions such as heart rate variability biofeedback training. Mobile health applications can help bridge this gap by making stress interventions more available to a variety of groups. Because culture is an important influential factor on stress response and recovery, it is important to understand if mobile health application benefits vary across different cultures. Here, we investigate how cultural differences influence the effectiveness of a mobile health application as an intervention to recover from acute stress. The application Happify Breather delivers a Heart Rate Variability Biofeedback (HRVB) exercise to help individuals recognize patterns in their heart rate and to increase variability through self-monitoring of their breathing pattern. Asian, Latino, and White student participants (N=46, 54.3% Asian, 28.3% Hispanic, 17.4% White, 75.5% Female) were recruited from the UCI SONA system. Participants underwent the Trier Social Stress Test (TSST) in which they were instructed to present a 3 minute speech shortly followed by a 2 minute arithmetic task while being video recorded in front of critically-evaluative panel. Participants then completed short surveys and were instructed to place their index finger over the iPhone camera lens to initiate the HRVB exercise via Happify. Saliva samples were collected for salivary alpha amylase immediately after the TSST and again twenty minutes later to assess physiological stress recovery. A

repeated measures ANCOVA analysis revealed that participants levels of salivary alpha amylase declined with use of Happify Breather, $F(2,41)=3.83, p=.05$, however culture did not moderate stress recovery, $F(2,41) = .079, p=.92$. Based on the study findings, HRVB from the Happify Breather application is an effective stress recovery intervention from acute stress. Because HRVB training is an effective treatment, researchers can prioritize improving its technology and user-interface knowing it can safely be implemented across cultures. Future research should aim to have more comprehensive measures to view both stress and culture.

379) Abstract 1754
FEASIBILITY OF USING ECOLOGICAL MOMENTARY ASSESSMENT (EMA) AND ELECTROCARDIOGRAM (ECG) MONITORING TO MEASURE STRESS REACTIVITY IN NATURAL SETTINGS

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Background: The way people respond to stressful situations (i.e., stress reactivity) varies widely due to differences in environments, cultural norms, and constraints. Researchers typically measure stress reactivity in laboratory settings, but this is problematic because stressful experiences rarely occur in isolation. Capturing the context surrounding these experiences is critical for identifying salient targets for intervention, particularly in low-income and minority populations, who are often exposed to more stressful situations in their daily lives and have fewer resources to manage their stress in healthy ways.

Objective: To examine the feasibility of using EMA and a wireless ECG patch to develop a measure of stress reactivity in natural settings.

Methods: We recruited 35 non-Hispanic Black, non-Hispanic White and Hispanic women (ages 23-51) to complete EMA surveys about their stressful experiences 4 times/day for seven consecutive days. Participants wore the Cardea SOLO wireless ECG monitor (Cardiac Insight Inc., Bellevue, WA) during the same period. We pre-processed the ECG data using Kubios HRV Premium and also used it to calculate 2 measures of heart rate variability (HRV) during the 5 minutes after the start of the EMA survey: RMSSD and STD RR (Table). Next, we used linear mixed models to generate participant-specific estimates of the difference in 5-minute HRV between times when participants did and did not report stressful experiences. Lastly, we compared resultant stress reactivity scores by socioeconomic status using t-tests (n=34).

Results: Study participants responded to 73.2% of all EMA prompts and completed a total of 722 EMA surveys. Participants reported stressful experiences an average of 4.7 out of the 7 days, and 97.8% reported both stressful days and non-stressful days. They wore the ECG patch for an average of 6.6 days; 80.9% of the 5-minute HRV intervals were valid (i.e., artifact levels $\leq 5\%$). We found significant differences in stress reactivity by financial burden but not education (Table).

Conclusion: Our findings suggest it is feasible to use EMA and an ECG patch to measure stress reactivity. Our results comparing stress reactivity by financial burden, a group who may have more limited resources to cope with stress in healthy ways, suggest this may be a promising method for measuring stress reactivity in natural settings.

Table. Stress reactivity score by socioeconomic status

	N	RMSSD (ms)			STD RR (ms)		
		Mean (SD)	t-value	p-value	Mean (SD)	t-value	p-value
Financial burden*							
High	9	-0.09 (0.12)	2.41	0.02	-0.09 (0.14)	2.64	0.01
Low	25	0.03 (0.12)			0.02 (0.10)		
Education			-0.57	0.57		-0.50	0.62
Less than a bachelor's degree	10	0.02 (0.16)			0.01 (0.14)		
Bachelor's degree or higher	24	-0.01 (0.12)			-0.01 (0.11)		

Abbreviations: ms = milliseconds, SD = standard deviation, RMSSD = root mean square of successive RR interval difference, STD RR = standard deviation of RR intervals
*Participants were asked how hard it was for them to pay for the very basics like food and heating. High financial burden included the responses "very hard," "hard," and "somewhat hard." Low financial burden included the response "not very hard."

380) Abstract 1750

KNOWING YOU CAN IS HALF THE BATTLE: SELF-CONFIDENCE AND SLEEP AMONG U.S. ARMY SOLDIERS

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The demands of service in the U.S. Army can make it difficult for Soldiers to attain sufficient sleep each night. Long hours, trainings, and deployments can impede Soldiers from getting enough sleep. Understanding how psychosocial factors such as self-monitoring, goal-setting, and self-confidence can play a role in Soldiers' sleep can shed light on strategies for improving sleep in this population. Using data from a pilot health promotion program, this study examined changes in sleep over time among participating Soldiers, and explored the psychosocial factors that predicted Soldiers' sleep behaviors. The 6-month pilot program focused on improving Soldiers' health behaviors, including sleep, and comprised 3 separate conditions in which: 1) Soldiers received educational curriculum, 2) Soldiers received curriculum and a fitness tracker, and 3) Soldiers received no program materials (i.e., a comparison condition). Data were collected via an online survey from participating Soldiers at the beginning of the pilot, at 3 months, and at 6 months ($n = 4418$). Results showed a significant increase in hours of weekday sleep over time among all participating Soldiers ($F(2,8646) = 47.72, p < .001$). There was a significant interaction by condition ($F(4,8646) = 5.36, p < .001$): participants in condition 1 had a large increase in sleep in the first 3 months followed by a smaller increase, and those in condition 2 showed a steady increase in sleep over all 6 months. Additional analyses showed that sleep behavior at the start of the pilot had the greatest impact on sleep 6 months later, for both weekday and weekend sleep ($F(1,4127) = 607.646, p < .001$; and $F(1,4115) = 840.812, p < .001$, respectively). In addition, although self-monitoring and goal-setting were not related to sleep hours at 6 month follow-up, self-confidence was a significant predictor of both workweek ($F(1,4127) = 311.687, p < .001$) and weekend ($F(1,4115) = 113.679, p < .001$) sleep. Soldiers who reported greater self-confidence at 3 months reported more sleep hours at 6 months. Overall, findings showed that confidence is key for achieving sufficient sleep, even above and beyond previous behavior. In alignment with existing theory, building confidence may be an effective strategy for improving sleep among this high risk population of Army Soldiers.

381) Abstract 1645

TOUCH DOWN! FREQUENCY OF PHYSICAL TOUCH IS ASSOCIATED WITH POSITIVE SLEEP OUTCOMES

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Background: Touch has demonstrated powerful effects for physiological and emotional development, with the focus of past research mainly examining parent-child and intimate partner relationships. However, the association between everyday non-romantic touch and physiological health outcomes is a nearly unexplored topic. Previous research has shown that parent-child physical contact enhances various physiological and behavioral functions for infants, including reduced stress reactivity and healthier sleeping patterns. Given the importance of sleep for a range of health outcomes, our aim was to examine the association between the frequency of non-romantic physical touch and various sleep outcomes.

Methods: Online surveys were administered to 251 undergraduates (mean age=19.96, 33.5% male). Measures included the recently developed 20-item Personal Affection & Touch Scale (PATS) that measures frequency, satisfaction, and comfort with touch, the

Pittsburgh Sleep Quality Index (PSQI) as a subjective measurement of sleeping habits, and self-reported health-relevant demographic variables. Bivariate Pearson's correlations and multiple regression analyses were utilized to examine the associations between physical contact and sleep. Only participants with complete data were used in each analysis.

Results: Unadjusted analyses revealed that total physical contact was associated with better overall sleep ($r(219) = -.181, p = .007$). Physical contact was also associated with the time it takes to fall asleep at night, with the amount of time taken to fall asleep decreasing as touch frequency increased ($r(243) = -.179, p = .005$). The associations still held when controlling for age, race, gender and specific health behaviors. In further exploration, the items of the PATS most associated with taking less time to fall asleep were more frequent touch during conversation, holding hands, massages, and tickling.

Conclusions: The preliminary results suggest that higher levels of non-romantic touch are associated with better sleep quality outcomes. These results support previous studies suggesting that physical touch is an important factor for well-being, and extends parent-child findings to a broader population.

382) Abstract 1507

AN EXPERIMENTAL INVESTIGATION OF SOCIAL STATUS STRESSORS AND LANGUAGE USE

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Objective: Differences in pronoun use are an indirect measure of attention (e.g., focus on self vs. other) and have been associated with social rank, stress, and biological markers that may link stress and socioeconomic position to disease, such as upregulation of proinflammatory gene expression (Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2013; Mehl, Raison, Pace, Arevalo, & Cole, 2017; Sakai & Carpenter, 2011). Thus, pronoun use represents a non-self-report measure that may increase our understanding of associations between lower socioeconomic position, stress, and poor health. However, no study has experimentally examined pronoun use in response to social status stressors.

Method: We conducted secondary analyses of a study of 180 undergraduate students. The study design manipulated exposure to three interpersonal stressors associated with social status in a fully crossed $2 \times 2 \times 2 \times 2$ (Perceived Relative Status [high vs. low] \times Partner Dominance [high vs. low] \times Evaluative Threat [high vs. low] \times Sex [male vs. female]) factorial design. Speech during a disagreement task with a recorded confederate was transcribed and submitted to the Linguistic Inquiry and Word Count (LIWC) analysis program (Pennebaker, Booth, & Francis, 2007).

Results: Participants who had a dominant interaction partner used more "we" language (e.g., first person plural pronouns) and less "me" language (e.g., first person singular pronouns). Participants exposed to evaluative threat also used less "me" language. In addition to these main effects, the combination of a dominant partner and evaluative threat resulted in particularly high use of "we" language. There was also a three-way interaction, which revealed that the combination of status stressors (low status relative to partner, dominant partner, evaluative threat) resulted in the least "me" language, and those who had no exposure to status stressors (high status relative to partner, submissive partner, no evaluative threat) used the most "me" language.

Conclusion: Interpersonal threats to social status resulted in less "me" language and more "we" language, especially during exposure to multiple status stressors, which likely co-occur in naturalistic settings. Results suggest that threats to social status may detract focus from the self and one's own goals and prompt more other-focused collective goals during social disagreement.

383) Abstract 1517

INDIVIDUAL DIFFERENCES IN AFFECT REACTIVITY TO MOMENTARY PAIN AND THEIR ASSOCIATIONS WITH MENTAL HEALTH IN CHRONIC PAIN PATIENTS

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Pain and affect are closely related and are associated across multiple timescales (e.g., globally, weekly, daily, and momentary). Individuals with chronic pain generally report elevated levels of negative affect. Nevertheless, individuals may differ in the *magnitude* of their affect reactivity to pain, which may have important implications for their mental health. The present study uses ecological momentary assessments (EMA) to examine individual differences in affect reactivity to momentary pain and their associations with some aspects of mental health. We hypothesized that individuals with greater coupling between momentary pain and affect experience higher levels of depressive and anxiety symptoms. EMA data from 290 chronic pain patients in three separate studies were re-analyzed and results were synthesized across studies using fixed effect meta-analyses. Results show that individuals with a stronger concurrent coupling between pain and negative affect experienced higher levels of depression ($r = .23, p < .05$) and anxiety ($r = .21, p < .05$) and individuals with stronger negative concurrent coupling between pain and positive affect reported higher levels of depression ($r = -.15, p < .05$) and anxiety ($r = -.14, p < .05$). Results from *lagged* analyses suggest that individuals with higher negative affect reactivity to pain (lagged pain-to-negative-affect association) experienced higher levels of depression ($r = .19, p < .05$) and anxiety ($r = .18, p < .05$). In addition, individuals with higher positive affect reactivity to pain (more reduction in positive affect) reported higher levels of depression ($r = -.16, p < .05$) and anxiety ($r = -.19, p < .05$). These findings suggest that individuals with greater affect reactivity to pain experience more mental health problems. This study offer new potential avenues for pain interventions to target the decoupling between pain and affect in patients with chronic pain.

384) Abstract 1636

INCIDENCE RATE AND PREDICTORS OF IRRITABLE BOWEL SYNDROME: A 15-YEAR COHORT STUDY IN JAPAN

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Background

To investigate non-patient irritable bowel syndrome (IBS) change to IBS and to determine factors predictive of the onset of IBS, individual biological factors, psychological factors, behavioral factors, and environmental factors were examined.

Methods

The subjects were 90 non-patient IBS (male = 45, female = 45, average age: 22.87 ± 2.55), including 58 of the diarrhea-predominant type and 32 of the constipation-predominant type selected from 1,409 university and technical college students by use of a questionnaire based on the Rome II diagnostic criteria. The subjects were followed for 15 years, and various characteristics and IBS symptoms were serially observed (60 times). The IBS incidence rate was calculated.

Results

During the 15 years, 65 non-patient IBS (72.22%) changed to IBS: 43 diarrhea-predominant types and 22 constipation-predominant types. All IBS symptoms disappeared in 20 non-patient IBS subjects (22.22%). According to quantification method II (discriminant

analysis), seven factors (cognitive appraisal, stressor, stress coping style, three kinds of lifestyle habits and psychologically abuse) were adopted as a predictive model for IBS incidence and were confirmed as predictive of IBS.

Conclusions

The results of this research show that non-patient IBS is a changeable state that can change into IBS or persons without symptoms. Most of the non-patient IBS subjects who became asymptomatic had had symptoms for six months or less. Furthermore, the longer a non-patient IBS subject had symptoms, the higher the risk of a change to IBS became. The findings suggest the usefulness of identifying and approaching non-patient IBS as early as possible to prevent the onset of IBS. It must be noted that the persons surveyed in the present study had only the diarrhea-predominant and constipation-predominant types. Therefore, the findings of the present study are limited only these two types. Further study including the mixed type is needed.

385) Abstract 1307

CHRONIC STRESS VERSUS DEPRESSION: WHAT'S THE DIFFERENCE IN PSYCHOLOGICAL PROFILE?

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Introduction: Strong epidemiological evidence links both chronic stress and clinical depression to increased risk of disease and death. Individuals living under chronic stress often resemble those diagnosed with major depressive disorder – reporting depressed mood, loss of interest or pleasure, and fatigue. Little empirical work however has attempted to quantitatively document if and how the psychological experience of being under chronic stress differs from that of being clinically depressed.

Methods: We compared chronically stressed mid-life women (mothers of children with an autism spectrum disorder) who did not meet criteria for major depression based on a Structured Clinical Interview (SCID; $n=58$) to age-matched clinically depressed women who were unmedicated ($n=57$), and to non-stressed non-depressed control women ($n=77$). These three groups were compared on depressive symptoms (Inventory of Depressive Symptoms), perceived stress (Perceived Stress Scale), anxiety (State Trait Anxiety Inventory), negative and positive mood (Positive and Negative Affect Schedule), positive well-being (Mental Health Consortium- Short Form), emotional expression (Toronto Alexithymia Scale), and daily appraisals of stress and affect averaged across 3 or more data collection days.

Results: Chronically stressed women reported significantly higher mean levels of depressive symptoms, perceived stress, anxiety, and worse daily mood compared to the control group, but these distress scores were significantly lower than the depressed women. Additionally, chronically stressed women reported higher levels of positive well-being and emotional expression compared to the clinically depressed women. In particular, a measure of positive well-being indicated that chronically stressed women reported they were able to grow from difficult experiences and express their own ideas and opinions, whereas depressed women reported low levels of these coping tools.

Conclusion: Results suggest that chronic stress may be experienced as high levels of distress coupled with specific positive psychological factors. Chronically stressed non-depressed women may be utilizing specific coping tools or have long standing personality attributes that help them remain resilient. These characteristics may be constructs to target to protect women from developing major depression in the face of chronic stress.

386) Abstract 1787

ROLE OF STRONG BLACK WOMAN STEREOTYPE ENDORSEMENT IN PHYSIOLOGICAL RESPONSE TO THE TRIER SOCIAL STRESS TEST (TSST)

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Background: The Strong Black Woman (SBW) stereotype or Superwoman schema, posits African American women are naturally strong, resilient, and self-reliant. Generally, resilience and strength are related to better mental and physical health outcomes (Friedli, 2009). However, greater endorsement of the SBW stereotype has been associated with cardiovascular disease (CVD) risk in African American women (Abrams, 2015). African American women have disproportionately high risk for stress related illness, indicating the importance of continued examination of the underlying mechanisms contributing to health disparities. This study represents an initial investigation of SBW endorsement and objective stress response via heart rate among a sample of African American women.

Methods: African-American women ($N = 23$, Target $N = 55$) aged 18-22 were recruited from a large public university. The 11-item Superwoman subscale of the Stereotypic Roles for Black Women (SRBW) scale was administered to assess SBW stereotype endorsement. Participants rated how much they agreed or disagreed with each item on a 5-point scale, with 5 being strongly agree. Assessments of heart rate were collected Pre-TSST and 0-, 15-, 30-, 45- and 60-minutes after the TSST. A two-factor repeated measures ANOVA was conducted to assess participant's heart rate before the TSST and across the recovery period. Participants were divided into groups to assess differences between women who endorsed SBW more strongly versus those who endorsed the stereotype less strongly.

Results: Of the 23 participants 19 had heart rate data for all time points. The assumption of sphericity did not hold for time ($W = .25$, $p = .10$). The Greenhouse-Geisser corrected interaction between group and time did not reach significance [$F(3.49, 59.28) = 1.20$, $p = .32$]. However, the current data are preliminary and are under powered [$\beta = .41$]. There was no main effect of time [$F(3.49, 59.28) = 0.31$, $p = .85$]. Compared to participants with greater endorsement of the SBW stereotype ($n = 9$), participants with lower endorsement of the SBW stereotype ($n = 10$) did not significantly differ in the heart rate in response to the TSST [$F(1,17) = 2.09$, $p = .17$].

Conclusion: While the results of the preliminary analysis were underpowered, future analysis may uncover a novel link between SBW stereotype endorsement and physiological stress responses.

387) Abstract 1204

INTOLERANCE OF UNCERTAINTY AS A MODERATOR OF THE PSYCHOLOGICAL BENEFITS OF VARIOUS EMOTIONAL COPING STRATEGIES AMONG WOMEN STRUGGLING WITH INFERTILITY

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Background: Though male and female-factor infertility are equally prevalent; women generally bear a disproportionate share of infertility-related burden; indeed 30-40% of women struggling with infertility experience clinically significant depression or anxiety. Considering the highly unpredictable nature of infertility, women who are highly intolerant of uncertainty may be at particularly increased risk. The current study aimed to shed light on which psychological coping strategies are associated with more positive psychosocial outcomes; furthermore, it examined intolerance of uncertainty as a potential moderator of these associations.

Methods: 119 North American women (19-43 yrs) who had been trying to conceive naturally for ≥ 12 months were recruited via social media for this online study. Participants completed questionnaires assessing intolerance of uncertainty (IUS-12), infertility-related quality of life (FertiQoL), anxious symptoms (STAI), depressive

symptoms (PHQ-9), and relationship quality (RDAS), respectively. Finally, the self-reported use of four psychological coping styles was assessed using a 15-item questionnaire developed by our group: suppression of negative emotions, active coping, engagement in activities unrelated to conception attempts, and downplaying the importance of having biological children.

Results: For all outcomes and in the entire sample of women, suppression was associated with worse outcomes while behavioural engagement was associated with more positive outcomes ($p < .05$). However, significant interactions between coping styles and intolerance of uncertainty suggested that the negative effect of emotional suppression on relationship quality was evident among women scoring low in intolerance of uncertainty ($\beta(SE) = -0.3(1.2)$, $p = .01$) but not among high scorers ($p = .22$). Furthermore, the benefits of behavioural engagement for relationship quality and quality of life were evident among high scorers ($\beta(SE) = 0.5(1.6)$ and $0.5(3.0)$, $p = .01$) but not among low scorers ($p > .05$). Finally, active coping benefited relationship quality overall, but this effect proved only significant in women scoring high in intolerance of uncertainty ($\beta(SE) = 0.7(1.7)$, $p < .01$).

Discussion: The current findings suggest that women who are high in intolerance of uncertainty may benefit from unique coping strategies as they experience infertility.

388) Abstract 1522

ILLNESS BELIEFS ASSOCIATED WITH CRITICISM IN CARERS OF PEOPLE RECENTLY DIAGNOSED WITH DEMENTIA

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Background: We have already shown in a longitudinal study that higher levels of Expressed Emotion (EE), particularly critical comments, in carers of recently diagnosed people with dementia (PwD) are associated with poorer wellbeing in both the PwD and the carers over a period of six months. Furthermore, there is a pathway from carer distress to psychological symptoms in PwD via the mediating variable of carer critical comments. In the present study, we aimed to determine whether beliefs about dementia underly carer's EE, particularly criticism. **Methods:** 61 carers of PwD were administered the Camberwell Family Interview (CFI) from which measures of EE (critical comments, hostility and emotional over-involvement) were coded by a trained rater. Carers were designated High- or Low-EE according to conventional criteria. Carers also completed the Brief Illness Perception Questionnaire (BIPQ). Two summary measures were derived from the BIPQ, labelled "concern" (encompassing beliefs about the timeline of dementia, its consequences, symptom load, and seriousness) and "control" (beliefs about the controllability of dementia). T-tests were used to compare the illness beliefs of 17 High- and 44 Low-EE carers. Correlations between EE measures and illness perceptions were computed. **Results:** Carer concern and control scores were weakly negatively correlated. High-EE carers scored significantly higher on the BIPQ concern variable and significantly lower on the BIPQ control variable than did Low-EE carers. Contrary to predictions, the relationship between High-EE and control beliefs was due to a correlation between critical comments and lower perceived control, whereas there was no significant association between EOI and control beliefs. **Conclusions:** Our findings suggest that the illness beliefs of carers of recently diagnosed PwD may be important determinants of EE, and in particular of critical comments, which have already been shown to predict wellbeing in PwD. As illness beliefs are potentially modifiable, these findings may inform interventions to help carers to have more adaptive beliefs about, and emotional responses to, dementia.

389) Abstract 1525

CREATING A SELF-COMPASSION MEASURE FOR RESPONSE TO GAMBLING FAILURES

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Introduction

Currently, the complex mechanisms underlying gambling disorders remain unclear, leading to inconsistent success in interventions. One likely psychological mechanism is Chasing losses, a phenomenon involving an excessively negative response to losing that causes the participant to attempt more gambling; the phenomenon is a common feature affecting the severity of gambling disorders. Because no intervention has focused on this aspect of gambling, here we aim to investigate the value of self-compassion, a cognitive behavioral therapy that encourages positive responses to the self (e.g., forgiveness, empathy) after negative events. We will create a self-compassion measure for gambling failure to examine potential relationships between self-compassion and chasing losses, then verify the measure's reliability and validity.

Method and design

After developing a self-compassion scale, we will use it in a preliminary investigation, and evaluate the results with a confirmatory factor analysis and Cronbach's alpha to verify reliability. Additionally, we will verify validity through determining correlations between self-compassion, well-being, gambling disorder severity, and mindfulness. We also analyzed the scale's predictiveness will be verified using a test that measures chasing losses.

Discussion

Although the specific mechanism underlying chasing losses remains unclear, we hypothesized that emotional regulation is involved. Therefore, we predicted that self-compassion could potentially reduce chasing losses. Our study should improve our knowledge of the relationship between chasing losses and self-compassion. Increasing self-compassion, should alleviate excessive suffering after gambling loss, thereby reducing attempts at chasing losses. In addition, self-compassion is effective at reducing social stigma, often attached to gambling disorders because affected individuals frequently engage in lying or suffer relapses. Decreasing perceived stigma could minimize these problematic behaviors and provide more opportunity for recovery.

390) Abstract 1803

SUBCONSCIOUS IMPLICIT ATTITUDES AND MEDICATION ADHERENCE BEHAVIOR: A PROMISING TARGET FOR INTERVENTION

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Background: Low adherence to antihypertensive medications remains a clinical and public health challenge, and current interventions are only minimally effective for clinically meaningful and lasting change in medication-taking behavior, requiring transformative research to address this gap. In response, the Science of Behavior Change initiative advocates for identification of measurable mechanisms of successful behavior change. While interventions to date have targeted deliberate (conscious) processes driving adherence behavior, such as explicit attitudes, automatically activated implicit (subconscious) attitudes are left unattended. In contrast to explicit attitudes, which are measured using direct, self-reported surveys, implicit attitudes operate outside the limits of conscious awareness and may be assessed using indirect, reaction time tasks such as the Implicit Association Test (IAT). The purpose of this study was to measure implicit attitudes toward medications using a Single-Category IAT

(SC-IAT) and examine the association between implicit attitudes and antihypertensive medication adherence.

Methods and Results: Data from 85 older insured adults with hypertension were analyzed (44.7% female, 20.0% black, mean age 62.3 years). Implicit attitudes were measured using standardized d-scores from a SC-IAT. Negative implicit attitudes were defined as scores in the lowest tertile of the distribution. Adherence was measured using prescription-based proportion of days covered (PDC). Low adherence was defined as PDC $p = 0.048$.

Discussion: Implicit attitudes are measurable and associated with medication adherence. Testing of a novel approach targeting improvement in implicit attitudes as the potential mechanism underlying change in medication-taking behavior is underway. Demonstration that implicit attitudes are malleable, and that improvement in implicit attitudes is causally associated with better adherence would align with the experimental medicine framework and inform targeted interventions to promote adherence and blood pressure control.

SYMPOSIA

Symposium 1434

Affect Dynamics and Health: How Changes in Affect Predict and Account for Behavioral, Physiological, and Physical Health Outcomes

Saturday, March 14 from 2:00 to 3:00 pm

AFFECT DYNAMICS AND HEALTH: HOW CHANGES IN AFFECT PREDICT AND ACCOUNT FOR BEHAVIORAL, PHYSIOLOGICAL, AND PHYSICAL HEALTH OUTCOMES

Brooke N. Jenkins, PhD, Psychology, Chapman University, Orange, CA, Kate A. Leger, PhD, Psychology, University of Kentucky, Lexington, KY, Nancy L. Sin, PhD, Psychology, The University of British Columbia, Vancouver, BC, Canada, Kate A. Leger, PhD, Psychology, University of Kentucky, Lexington, KY, Brooke N. Jenkins, PhD, Psychology, Chapman University, Orange, CA, Sarah D. Pressman, PhD, Psychological Science, University of California, Irvine, Irvine, CA

A large body of literature supports that positive and negative affect are associated with health and health-relevant outcomes. However, new work is beginning to emerge examining how changes in affect over time relate to health. This research emphasizes the ideas that variations in affect occur regularly, there are between and within person differences in these fluctuations, and these dynamics of affect have important physiological, behavioral, and physical health implications. In this symposium, we explore how affect dynamics such as affect responsivity, reactivity, and variability are associated with health. The first speaker uses a daily diary design to examine the bidirectional relationship between sleep and daily positive event-related fluctuations in positive affect. The second speaker will elaborate on affect reactivity to daily events and analyze the mediating relationship between personality traits and physical health. The third speaker will further explore associations between affect variability and a variety of health and health-relevant outcomes in a series of three studies using longitudinal data. The discussant, a distinguished affective health researcher, will facilitate a discussion integrating the findings from the three presentations and highlight implications for future directions in affect dynamics and health research. In conclusion, this symposium brings together work on the bidirectional association between affect dynamics and health, how affect dynamics mediates associations between personality and health, and how affect dynamics relates to a broad array of health and health-relevant outcomes.

Individual Abstract Number: 1438

Bidirectional relationships between sleep duration and affective responsiveness to daily positive events

Nancy L. Sin, PhD, Psychology, The University of British Columbia, Vancouver, BC, Canada, Jin H. Wen, BA, Patrick Klaiber, MS, Psychology, University of British Columbia, Vancouver, BC, Canada, Orfeu M. Buxton, PhD, Biobehavioral Health, David M. Almeida, PhD, Human Development and Family Studies, Pennsylvania State University, University Park, PA

Past experimental research suggests that inadequate sleep can disrupt positive affective responses to positively-valenced stimuli. However, less is known regarding whether sleep influences next-day responsiveness to naturally-occurring positive events in daily life, as well as the reversed direction of association (i.e., *Does affective responsiveness to daily positive events predict subsequent sleep?*). The objective of this study was to examine the within-person, bidirectional associations between nightly sleep duration and daily positive event-related fluctuations in positive affect. A national sample of 2,022 adults ages 35-85 in the National Study of Daily Experiences II self-reported sleep duration, positive events, and positive affect during telephone interviews for 8 consecutive days. Multilevel modeling analyses revealed linear and quadratic moderating effects of sleep duration on positive affective responsiveness to daily positive events

(quadratic interaction: $Est = 0.011$, $SE = 0.003$, $p < 0.001$), such that there were greater increases in positive affect on positive event days following longer-than-usual (vs. shorter-than-usual) sleep duration. Results for the reversed direction of association showed weak evidence of affective reactivity to positive events as predictors of subsequent sleep duration. Specifically, the interaction between positive affect and positive events marginally predicted same-night sleep duration (interaction: $Est = 0.152$, $SE = 0.089$, $p = 0.09$), such that level of positive affect on positive event days (i.e., responsiveness to positive events) was unrelated to subsequent sleep duration, whereas higher-than-usual positive affect on days without positive events predicted shorter same-night sleep duration (simple slope: $Est = -0.114$, $SE = 0.046$, $p = 0.014$). Thus, these findings indicate that longer sleep is associated with enhanced positive affective responses to daily positive events, and that (absence of) positive events provide a critical context for understanding whether increased positive affect can be detrimental for sleep. Daily behaviors and experiences, particularly sleep and positive events, are therefore important to consider as determinants of affective dynamics and downstream physical health.

Individual Abstract Number: 1437

Affect reactivity to daily stressors partially mediates the relationship between personality traits and future physical health outcomes

Kate A. Leger, PhD, William Bowling, BA, Psychology, University of Kentucky, Lexington, KY, Nicholas A. Turiano, PhD, Psychology, West Virginia University, Morgantown, WV, Jessica L. Burris, PhD, Psychology, University of Kentucky, Lexington, KY, David M. Almeida, PhD, Department of Human Development and Family Studies, Pennsylvania State University, University Park, PA

Personality traits are strong predictors of physical health across the life span. Affective responses to daily stressors are independently associated with both personality traits (e.g. neuroticism) and physical health outcomes (e.g. chronic conditions, mortality). Yet, few studies have examined how affect reactivity to daily stressors may act as a mediating pathway between personality traits and future physical health outcomes. The current study examines this association using data from Waves 2 and 3 of the Midlife in the United States (MIDUS) Survey and National Study of Daily Experiences (NSDE). A national sample of 1,200 adults ages 35-85 reported daily stressors and affect in telephone interviews across an 8 day period. Participants completed a follow-up assessment 10 years later where they reported on their physical health including chronic conditions and functional limitations. Regression models indicated that greater negative affect reactivity to daily stressors was related to higher levels of neuroticism ($b = 0.14$, $p = .01$) and lower levels of conscientiousness ($b = -0.25$, $p = .01$). Negative affect reactivity was also positively related to the occurrence of chronic conditions ($b = 1.04$, $p < .001$) and severity of functional limitations ($b = 0.83$, $p < .001$) in the future. Formal tests of mediation showed that negative affect reactivity partially mediated the relationship between these personality traits and chronic conditions (neuroticism: $b = 0.04$, $p = .04$; conscientiousness: ($b = -0.04$, $p = .02$) and functional limitations (neuroticism: $b = 0.04$, $p = .03$; conscientiousness: $b = -0.02$, $p = .04$). Findings suggest that associations between higher levels of neuroticism and lower levels of conscientiousness and the development of poor physical health and related outcomes is partially explained by negative affect reactivity to daily stressors. These findings suggest that emotion regulation strategies may be potential points of intervention for people with personality traits at risk for poor health.

Individual Abstract Number: 1436

When is affect variability bad? Examining the associations between affect variability and mental, physiological, and physical health outcomes

Brooke N. Jenkins, PhD, Lydia Ong, BA, Julia Boehm, PhD, Psychology, Chapman University, Orange, CA, John Hunter, PhD, Psychology, University of California, Irvine, Irvine, CA, Marie Cross, PhD, Biobehavioral Health, Pennsylvania State University, University

Park, PA, Amanda Acevedo, PhD, Basic Biobehavioral and Psychological Sciences Branch, National Cancer Institute, Bethesda, MD, Sarah Pressman, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Michael Richardson, PhD, Psychology, Macquarie University, Sydney, NA, Australia, Tamlin Conner, PhD, Psychology, University of Otago, Dunedin, NA, New Zealand

Greater variability in affect has been linked with worse mental health. However, previous research has not examined how affect variability relates to physiological and physical health. Further, the moderating effect of mean level on the affect variability-health relationship is rarely explored. In three studies, we investigate how day-to-day positive and negative affect variability and their interactions with mean levels predict mental (Study 1: depressive symptoms), physiological (Study 2: vaccine response), and physical (Study 3: chronic conditions, mortality) health outcomes. In Study 1 ($N = 1,482$), we find that higher variability is associated with greater depressive symptoms (positive affect variability: $b = 0.31, p < .001$; negative affect variability: $b = 0.19, p < .001$). Moreover, affect variability interacts with mean levels to predict depressive symptoms (positive affect mean*variability: $b = 0.33, p < .001$; negative affect mean*variability: $b = -0.69, p < .001$). Specifically, more variability was a protective factor such that when individuals had high mean negative affect or low mean positive affect, having greater variability led to fewer depressive symptoms. Study 2 ($N = 83$), demonstrates positive affect has a variability by mean level interaction on immune response such that individuals who are high in mean positive affect have lower antibody responses to the flu vaccine when their positive affect variability is also high ($b = -574.31, p = .038$). In Study 3 ($N = 1,500$), we show that greater positive affect variability is associated with more chronic conditions 10 years later ($b = 0.31, p < .01$), but that negative affect variability interacts with mean negative affect ($b = -0.09, p < .001$). Specifically, at higher levels of mean negative affect, greater variability again appears to serve as a protective factor leading to fewer chronic conditions. However, neither affect variability nor its interaction with mean levels predicted mortality ($ps > .05$). Together, results consistently demonstrate that more variability is associated with worse mental, physiological, and physical health outcomes but that this relationship might not hold with a long-term outcome like mortality. Additionally, interactions between mean and variability suggest that high variability buffers against the detrimental effects of high mean negative and low mean positive affect.

Symposium 1466

Diabetes and Metabolic Risk: Systematic Review of Findings, Longitudinal Changes over 6 years, and Relation to Neighborhood Environments from the Hispanic Community Health Study / Study of Latinos (HCHS/SOL)

Saturday, March 14 from 2:00 to 3:00 pm

DIABETES AND METABOLIC RISK: SYSTEMATIC REVIEW OF FINDINGS, LONGITUDINAL CHANGES OVER 6 YEARS, AND RELATION TO NEIGHBORHOOD ENVIRONMENTS FROM THE HISPANIC COMMUNITY HEALTH STUDY / STUDY OF LATINOS (HCHS/SOL)

Carmen R. Isasi, MD, PhD, Department of Epidemiology & Population Health, Department of Pediatrics, Albert Einstein College of Medicine, Bronx, NY, Maria M. Llabre, PhD, Department of Psychology, University of Miami, Miami, FL, Gladys Crespo-Ramos, Ph.D., Ferkauf Graduate School of Psychology, Yeshiva University, Bronx, NY, Christina M. Cordero, PhD, MPH, Department of Psychology, University of Miami, Miami, FL, Kimberly L. Savin, BA, Joint Doctoral Program in Clinical Psychology, San Diego State University / University of California San Diego, San Diego, CA, Jeffrey S. Gonzalez, Ph.D., Ferkauf Graduate School of Psychology, Yeshiva University, Departments of Medicine and Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY

Background: Hispanic/Latino individuals experience disparities in rates of chronic illness due to biological and clinical factors, as well as environmental and social factors. We discuss results from three studies related to diabetes from the HCHS/SOL, a multi-center cohort of Hispanics/Latinos.

Results: The first study systematically reviewed the baseline diabetes studies from HCHS/SOL, related to (1) Prevalence, (2) Correlates and (3) Health-Psychosocial associations. Findings from 40 studies suggest variations across heritage groups for diabetes, probable diabetes, and prediabetes. Several factors correlated with diabetes: lower education, living in the US ≤ 10 years, higher body mass index (BMI) and lower income. Diabetes prevalence was associated with cardiovascular risk factors, sleep problems, less healthy dietary patterns, psychological distress, worse cognitive functioning, and lower social support.

The second study examined 6-year changes in diabetes prevalence and incidence ($n=11,659$). Diabetes prevalence increased from 17.6% to 20.3%. At the second visit, prevalence was higher among Puerto Rican (23.7%), Dominican (22.3%), and Mexican (22.0%) participants, those aged 65-80 years (81.1%), and with BMI ≥ 30 (26.7%). The prevalence and incidence of CVD was significantly higher among those with diabetes (10.9% vs 5.2%).

The final study examined associations of neighborhood environments with 6-year changes in diabetes risk in 2,909 San Diego HCHS/SOL participants without diabetes at baseline. Metabolic risk factors were assessed at baseline and 6 years later. Neighborhood environments were geocoded using Census data to create composite indices. Living in neighborhoods with higher social disorder predicted 6-yr increases in BMI ($\beta=0.05, p=.009$). Higher residential stability predicted 6-yr increases in BMI ($\beta=0.04, p=.031$) and HbA1c ($\beta=0.05, p=.038$) and higher walkability ($\beta=0.06, p=.018$) predicted 6-yr increases in HbA1c.

Conclusion: These HCHS/SOL findings show high diabetes prevalence and incidence in Hispanics/Latinos that varies across heritage group, duration of US residence, age and BMI. Associations of neighborhood characteristics with metabolic risk over time are complex with some protective factors and others promoting risk. These findings provide insight into risk and protective factors for diabetes in Hispanics/Latinos from four US regions.

Individual Abstract Number: 1470

Systematic Review of Diabetes Findings from the Hispanic Community Health Study / Study of Latinos (HCHS/SOL)

Gladys Crespo-Ramos, Ph.D., Jennifer Gittleman, BA, Claire J. Hoogendoorn, PhD, Ferkauf Graduate School of Psychology, Yeshiva University, Bronx, NY, Linda C. Gallo, PhD, Department of Psychology, San Diego State University, San Diego, CA, Maria M. Llabre, PhD, Department of Psychology, University of Miami, Miami, FL, Jeffrey S. Gonzalez, PhD, Ferkauf Graduate School of Psychology, Yeshiva University, Departments of Medicine and Epidemiology & Population Health, Albert Einstein College of Medicine, Bronx, NY

Background: The Hispanic Community Health Study/Study of Latinos (HCHS/SOL) is a multi-center epidemiologic study in Hispanic/Latino populations that aims to assess the prevalence and development of diseases, and to identify factors playing a protective or harmful role in the health of Hispanics/Latinos. We systematically reviewed the baseline diabetes studies from HCHS/SOL, related to (1) Prevalence, (2) Correlates and (3) Health-Psychosocial associations.

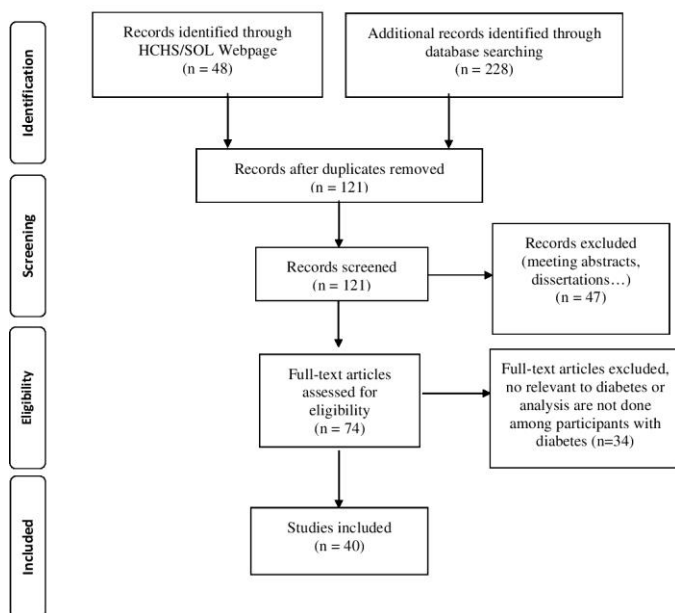
Methods: During 2008-2011 a total of 16,415 participants (18-74 years) of Hispanic/Latino origin specifically Cuban, Puerto Rican, Dominican, Mexican, Central and South American, enrolled from four U.S. metropolitan areas: Miami, San Diego, Chicago and the Bronx area of New York. The current review followed a PRISMA like guideline, we search in electronic databases: PubMed, Embase, PsycINFO, Web of Science, through January 2019. A complete article list from the study HCHS/SOL website was also reviewed to identify studies for inclusion.

Results/Findings: A search process turned up 121 records, 40 articles were included after excluding non-peer review records and articles not

related to diabetes (see PRISMA Flow Chart). Findings suggest marked variations across heritage groups for diabetes (Mexicans 18.30% vs South Americans 10.2%), probable diabetes (Central American 7.70% vs Puerto Rican 5.40%) and prediabetes (Mexican 37.80% vs Dominicans 31.80%). Several factors correlated with diabetes: lower education, living in the US ≤ 10 years, higher body mass index and lower household income. Diabetes prevalence and poor glycemic control were associated with cardiovascular risk factors, sleep problems, less healthy dietary patterns, psychological distress, worse cognitive functioning, and lower social support.

Conclusions: This is the first systematic review on diabetes from the HCHS/SOL study. Some Hispanic/Latino groups experience much lower rates of diabetes (Cubans and South Americans) than other heritage groups (Mexicans, Dominicans and Puerto Ricans). These findings highlight the importance of including and considering multiple Hispanic/Latino heritage groups as part of population-based research examining health, and particularly diabetes. Additionally, findings provide suggestions for culturally sensitive social and behavioral interventions when providing healthcare to Hispanics/Latinos with diabetes.

Figure 1. PRISMA Flow Chart Abstract 1470



Individual Abstract Number: 1527

Longitudinal Change in Diabetes Status, Treatment, Glycemic Control and Cardiovascular Disease in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)

Christina M. Cordero, PhD, MPH, Neil Schneiderman, PhD, Maria M. Llabre, PhD, Department of Psychology, University of Miami, Miami, FL, Yanping Teng, MD, MSPH, Department of Biostatistics, University of North Carolina Chapel Hill, Chapel Hill, NC, Martha Daviglus, MD, PhD, Institute for Minority Health Research, University of Illinois Chicago, Chicago, IL, Jianwen Cai, PhD, Department of Statistics, University of North Carolina Chapel Hill, Chapel Hill, NC, Gregory A. Talavera, MD, MPH, Department of Psychology, San Diego State University, San Diego, CA, Robert Kaplan, PhD, Albert Einstein College of Medicine, robert.kaplan@einstein.yu.edu, Bronx, NY, Linda C. Gallo, PhD, Department of Psychology, San Diego State University, San Diego, CA, Catherine C. Cowie, PhD, MPH, Division of Diabetes, Endocrinology, and Metabolic Diseases, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, Elizabeth M. Cespedes, ScD, Division of Research, Kaiser Permanente, Oakland, CA, Larissa Avilés-Santa, MD, MPH, Division of Cardiovascular Sciences, National Heart, Lung, and Blood Institute, Bethesda, MD

Objective: To examine changes in diabetes prevalence and incidence among Hispanic adults.

Research Design and Methods: The Hispanic Community Health Study/Study of Latinos is a prospective, multi-center, population-based study with participants from four U.S. metropolitan areas (Bronx, Chicago, Miami, and San Diego). Participants aged 18 to 74 years were enrolled from 2008-2011 and underwent a baseline clinical examination and were followed annually via telephone interview. In 2014-2017, participants returned for a second clinical examination. Diabetes was defined according to criteria by the American Diabetes Association (using fasting plasma glucose, glucose tolerance, and glycosylated hemoglobin) or by self-report of diabetes in a small percentage of participants. Cardiovascular disease (CVD) was defined by self-report of heart attack or stroke, or having had an angioplasty, stent, or bypass procedure or by ECG of possible myocardial infarction at baseline. Prevalence estimates and incidence rates were weighted for sampling procedures and standardized using the 2010 U.S. standard population.

Results: Approximately 71% of participants returned for a second clinical examination (N=11,623). During the study period, the diabetes prevalence increased from 17.6% at the baseline examination to 20.3% at the second examination and the overall age-adjusted diabetes incidence rate was 13.7 cases per 1,000 person-years. At the second examination, the prevalence was higher among those of Puerto Rican (23.7%), Dominican (22.3%), and Mexican (22.0%) descent compared to other Hispanic/Latino background groups, as well as among those aged 65-80 years (81.1%) and with a body mass index (BMI) ≥ 30 (26.7%). About 1 in 3 were unaware of their diabetes status previous to clinical examination. Health insurance coverage (77.5% vs. 55.8%) and diabetes treatment (54.5% vs. 46.9%) increased at the second examination compared to baseline. Across both visits, the prevalence of CVD was significantly higher among those with diabetes (10.9%) compared to those without diabetes (5.2%).

Conclusions: Our results show an increase in diabetes prevalence among a diverse Hispanic population, with differences noted by Hispanic/Latino background, age, and BMI. Older populations are a vulnerable group that may benefit from additional intervention as they age.

Individual Abstract Number: 1469

Neighborhood Environments and 6-year change in Metabolic Risk among Hispanics/Latinos living in San Diego: The HCHS/SOL Community and Surrounding areas (SOL CASAS) Study

Kimberly L. Savin, BA, Joint Doctoral Program in Clinical Psychology, San Diego State University / University of California San Diego, San Diego, CA, Scott C. Roesch, PhD, Psychology, San Diego State University, San Diego, CA, Jordan A. Carlson, PhD, Center for Children's Healthy Lifestyles and Nutrition, Children's Mercy Kansas City, Kansas City, MO, Marta M. Jankowska, PhD, Qualcomm Institute, Matthew A. Allison, MD, MPH, James F. Sallis, PhD, Family Medicine and Public Health, University of California San Diego, San Diego, CA, Daniela Sotres-Alvarez, DrPH, Biostatistics, University of North Carolina, Gillings School of Global Public Health, Chapel Hill, NC, Gregory A. Talavera, MD, MPH, Psychology, San Diego State University, San Diego, CA, Carmen R. Isasi, MD, PhD, Epidemiology and Public Health, Albert Einstein College of Medicine, Bronx, NY, Krista M. Perreira, PhD, Social Medicine, The University of North Carolina at Chapel Hill, Chapel Hill, NC, Earle C. Chambers, PhD, Family and Social Medicine, Albert Einstein College of Medicine, Bronx, NY, Mayra L. Estrella, PhD, MPH, Martha Daviglus, MD, PhD, Institute for Minority Health Research, University of Illinois at Chicago, Chicago, IL, Maria M. Llabre, PhD, Department of Psychology, Frank J. Penedo, PhD, Psychology, University of Miami, Miami, FL, Linda C. Gallo, PhD, Department of Psychology, San Diego State University, San Diego, CA

Background: Neighborhood environments have been linked with many health outcomes. We examined associations of neighborhood environments with 6-year changes in metabolic risk among Hispanics/Latinos.

Method: Data were from 2,909 Hispanics/Latinos without diabetes living in San Diego enrolled in the HCHS/SOL and SOL CASAS ancillary study. Hispanics/Latinos completed a clinical exam with assessment of metabolic risk factors at baseline and 6 years later. SOL CASAS examined neighborhood environments at baseline by geocoding home addresses and using 800m circular buffers. Neighborhood indices were created including socioeconomic deprivation, residential stability, and social disorder, assessed using Census data. The walkability index was computed as land use mix and density of intersections and residential dwellings. Greenness, computed using satellite imagery, was measured using the Normalized Difference Vegetation Index. Complex survey multilevel modeling simultaneously examined associations of the five neighborhood indices with 6-year incident diabetes and obesity and changes in BMI, HbA1c, HOMA-IR. Analyses were also conducted stratified by age (18-44 vs. 45-74 years) and sex.

Results: After adjusting for age, sex, income, education, nativity, heritage, marital status, and time between visits, living in neighborhoods with higher social disorder predicted increases in BMI across 6 years ($\beta=0.05$, $p=.009$). Contrary to predictions, higher residential stability predicted 6-yr increases in BMI ($\beta=0.04$, $p=.031$) and HbA1c ($\beta=0.05$, $p=.038$) and higher walkability ($\beta=0.06$, $p=.018$) predicted 6-yr increases in HbA1c. In age-stratified analyses, higher social disorder predicted greater 6-yr HOMA-IR increases in those age

Conclusion: We observed prospective, positive, and some surprising associations of neighborhood residential stability with BMI and HbA1c, social disorder with BMI, and walkability with HbA1c. Beyond individual sociodemographic factors, neighborhood environments may shape change in metabolic risk of Hispanics/Latinos.

Symposium 1629

Dimensions of Discrimination and Health: Examining Effects across Age and Social Context

Thursday, March 12 from 4:15 to 5:30 pm

DIMENSIONS OF DISCRIMINATION AND HEALTH: EXAMINING EFFECTS ACROSS AGE AND SOCIAL CONTEXT

Elizabeth Brondolo, Ph.D., Psychology, St. John's University, Jamaica, NY, Tené T. Lewis, PhD, Epidemiology, Emory University, Atlanta, GA, Chad Danyluck, Ph.D, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, Irene V. Blair, PhD, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, Danielle L. Beatty Moody, PhD, Psychology, University of Maryland Baltimore County, Baltimore, MD

Racial discrimination is a broad construct that is manifest in multiple types of behaviors, experienced at cultural, institutional, interpersonal, and intrapersonal levels. Discrimination has been documented to have effects on health across physiological domains. However, there is a need for greater clarity in three areas. Do different types of discrimination influence health outcomes? Are these effects consistent across the lifespan? Do personal or contextual resources mitigate the effects of discrimination on health?

The primary aim of this symposium is to present new data addressing these questions. Presenters examine types of discrimination including historical trauma, directly experienced discriminatory events, vicarious exposure to discrimination, and the perceived burden of discrimination. Analyses tease apart the effects of discrimination from other related psychosocial stressors, including early life adversity. Presenters also address age differences in the health effects of discrimination. Finally, the presentations examine factors that may mitigate the effects of racism on health. Two presentations focus on African Americans, and two on American Indians and Alaska Natives (AI/AN). Health outcomes include sleep, allostatic load and amygdala volume.

Danielle Beatty Moody will present data on the effects of different dimensions of discrimination on amygdala volume in older African Americans. Tene Lewis will examine the association of personal and vicarious exposure to discriminatory events on sleep quality in a large sample of African Americans. Chad Danyluck will examine how age and education moderate the associations of different types of directly perceived discrimination with sleep quality in AI/AN. Irene Blair will discuss the effects of historical trauma on allostatic load in AI/AN.

These presentations offer an opportunity to develop a richer understanding of the ways in which different types of discrimination undermine health equity. We will discuss psychobiological mechanisms linking discrimination to health, and the ways in which these mechanisms vary depending on type of discrimination, age, and cultural context. These variations may provide insight into the drivers of health disparities and potential solutions for health equity.

Individual Abstract Number: 1647

Exposure to Personal and Vicarious Racism-Related Traumas and Poor Sleep in African-American Women

Tené T. Lewis, PhD, Telisa Spikes, PhD, Miriam E. Van Dyke, MPH, Izraelle I. McKinnon, MPH, Viola Vaccarino, MD, PhD, LeTryce Scully, MS, Epidemiology, Renee Moore, PhD, Biostatistics, Bianca Booker, MA, Epidemiology, Emory University, Atlanta, GA

Background: Racism-related stressors have been linked to poor health, but most studies have focused on day-to-day forms of racism that directly impact the individuals under study. Few studies have examined whether exposure to more extreme, traumatic racism-related events are associated with health, and more specifically, whether racism-related traumas (RRT) that happen to same-race others (i.e. vicarious RRT) are as impactful as events experienced by the individual. We examined the association between exposure to personal and vicarious RRT and poor sleep, an emerging risk factor for chronic disease, in a cohort of African-American women.

Methods: Participants were 408 African-American women aged 30-46 (Mean = 37.4 \pm 4.2 years) of varying educational backgrounds, from the southeastern United States. Exposure to racism-related traumas were assessed via the 22-item Race-Related Events Scale, with 15 presence/absence items assessing personal exposures (e.g. "someone beat or hurt me because of my race or ethnicity") and 7 presence/absence items assessing vicarious exposures (e.g. "saw someone who is the same race or ethnicity as me seriously injured/killed because of their race or ethnicity"). Sleep outcomes were self-reported sleep duration, and subjective sleep quality measured with the Pittsburgh Sleep Quality Index (PSQI). Multivariable linear regression analyses examined associations between types of RRT and poor sleep before and after adjustment for covariates.

Results: On average, women reported 3.9 \pm 3.2 personal and 2.8 \pm 1.8 vicarious exposures. In unadjusted analyses, personal ($\beta=-.09$, $p<.001$) but not vicarious ($\beta=-.05$, $p=.25$) RRT were associated with shorter sleep duration. Similar findings were observed for subjective sleep quality (personal ($\beta=-.04$, $p<.0001$; vicarious $\beta=-.01$, $p=.54$). Findings were comparable after adjusting for age, education, body mass index and negative affect.

Conclusions: Personal, but not vicarious, exposure to RRT was associated with poor sleep among African-American women. These differential results suggest that personal and vicarious exposures may operate via different affective and/or cognitive pathways. Future studies are needed to examine linkages between RRT and poor health in African-Americans and other vulnerable groups; particularly given documented increases in racism-related acts of violence in recent years.

Individual Abstract Number: 1669

Discrimination and Sleep Impairment Among American Indians and Alaska Natives

Chad Danyluck, Ph.D, Irene V. Blair, Ph.D, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, Mark L. Laudenslager, Ph.D, Psychiatry-Behavioral Immunology, Stacie L. Daugherty, MD, Cardiology, Spero M. Manson, Ph.D, Colorado School of Public Health, University of Colorado Anschutz Medical Campus,

Aurora, CO, Joshua Correll, PhD, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, Elizabeth Brondolo, PhD, Psychology, St. John's University, Queens, NY

Discrimination predicts sleep impairment in numerous vulnerable and stigmatized populations. As of yet, however, there is no work linking discrimination to sleep impairment in American Indians and Alaska Natives (AI/ANs). Further, much is still unknown about whether other factors modify the association between discrimination and sleep impairment, like differential access to resources. It is also unclear whether the association between discrimination and sleep impairments differs across the lifespan. The present study investigated these questions in a multi-method study of 303 urban-dwelling AI/ANs who completed measures of lifetime discrimination and sleep impairments and indicated their sociodemographics (e.g., age, gender, education, income). As anticipated, lifetime discrimination was associated with sleep impairment among AI/ANs before and after adjusting for sociodemographic variables. Moreover, the association between lifetime discrimination and sleep impairment was modified by age and by education—this association was especially strong among younger and among less educated AI/ANs. Because discrimination against AI/ANs can be common and sleep impairment predicts worse health, our finding suggests that younger AI/ANs may be at particular risk for illness over time. Additionally, education might play an important role in buffering people from the harms of discrimination.

Individual Abstract Number: 1704

Historical Trauma and Allostatic Load in American Indians and Alaska Natives

Irene V. Blair, PhD, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, Stacie L. Daugherty, MD, Cardiology, University of Colorado Anschutz Medical Campus, Aurora, CO, Elizabeth Brondolo, PhD, Psychology, St. John's University, Jamaica, NY, Spero M. Manson, PhD, Centers for American Indian and Alaska Native Health, University of Colorado Anschutz Medical Campus, Aurora, CO, Edward P. Havranek, MD, Cardiology, Denver Health and Hospital Authority, Denver, CO, John F. Steiner, MD, Institute for Health Research, Kaiser Permanente Colorado, Denver, CO, Chad Danyluck, PhD, Joshua Correll, PhD, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, Mark L. Laudenslager, PhD, Psychiatry, University of Colorado Anschutz Medical Campus, Aurora, CO

Historical trauma has received increasing attention as a means to understand the experiences of those who, in addition to ongoing discrimination and disadvantage, share a history of traumatic events perpetrated at the group level (e.g., the Holocaust, “ethnic cleansing”, or colonization). Whitbeck and colleagues have shown that historical trauma, specifically the frequency of thinking about associated losses, is related to higher levels of psychological distress and alcohol abuse among American Indians and Alaska Natives (AI/AN). In the present study, 303 urban-dwelling AI/AN reported on the frequency with which they think about five losses to AI/AN, based on Whitbeck’s Historical Trauma scale: loss of language, loss of culture, loss of rights from broken treaties, and loss of family members and close ties due to boarding schools and forced relocation. The participants also provided biomarkers of allostatic load, or the bodily wear and tear that is believed to occur as a consequence of chronic stress. Study results showed that historical trauma was significantly associated with stress biomarkers, particularly metabolic markers (e.g., BMI, central adiposity, LDL cholesterol, and hs-CRP). These results held even after controlling for childhood trauma and past-year major life experiences. The study findings will be discussed in terms of differences across types of discrimination and trauma, and the ways in which multi-layered, group-associated trauma contributes to health disparities.

Individual Abstract Number: 1751

Multiple Dimensions of Individual-Level Discrimination and Amygdala Volume Among Urban-Dwelling African Americans

Danielle L. Beatty Moody, PhD, Psychology, University of Maryland Baltimore County, Baltimore, MD, Shari R. Waldstein, PhD,

Psychology, University of Maryland, Baltimore County, Baltimore, MD, Alan B. Zonderman, PhD, Michele K. Evans, MD, Laboratory of Epidemiology and Population Science, National Institute on Aging, Baltimore, MD, Daniel K. Leibel, MA, Psychology, University of Maryland Baltimore County, Baltimore, MD, Elizabeth J. Pantesco, PhD, Psychology, Villanova University, Bryn Mawr, PA, Afghanistan, Antione D. Taylor, PhD, Neuropsychology, MedStar National Rehabilitation Hospital, Washington, DC, Taylor Darden, MA, Psychology, University of Maryland, Baltimore County, Baltimore, MD, Christos Davatzikos, PhD, Radiology, University of Pennsylvania, Philadelphia, PA, Guray Erus, PhD, Radiology, University of Pennsylvania, Philadelphia, PA, Lesile I. Katzel, MD, Medicine, Rao P. Gullapalli, PhD, Diagnostic Radiology and Nuclear Medicine, Stephen L. Seliger, MD, Medicine, University of Maryland, Baltimore, MD

Background: African Americans disproportionately experience discrimination, a chronic stressor linked to their earlier onset of age-related diseases. The relation of discrimination to structural alterations in stress-regions of the brain remains understudied.

Participants and Methods: African Americans ($N=87$, 60.6% female, mean age=50) in the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) SCAN study underwent 3.0-T cranial magnetic resonance imaging including T1-weighted MP-RAGE sequences; images were coded for amygdala volumes. Participants reported racial, lifetime burden, and everyday discrimination five years earlier. Multivariable regression was used to assess linear and quadratic relations of the discrimination indices with left and right amygdala volumes (examined separately), adjusted for age, sex, socioeconomic status, and (in sensitivity analyses) psychological factors (perceived stress; depressive, anxiety, & post-traumatic stress disorder symptoms).

Results: Significant quadratic relations of racial and lifetime discrimination with left ($p=.01$) and right ($p=.02$) amygdala volumes, respectively, showed that as ratings of discrimination increased, amygdala volumes initially decreased, then increased. Similar, but marginally significant, patterns of relations were noted for racial and lifetime discrimination with right ($p=.059$) and left ($p=.057$) amygdala volumes, respectively (independent of sensitivity analyses). We also observed significant positive linear relations of everyday discrimination with left ($p=.04$) and right ($p=.02$) amygdala volumes that were rendered non-significant in sensitivity analyses.

Conclusions: The nonlinear (J-shaped) relations suggest that those reporting the highest levels of racial and lifetime discrimination exhibit the largest amygdala volumes relative to those with mid-range scores; still, those reporting the least discrimination also displayed slightly greater amygdala volumes than the mid-range. Prospective studies are needed to determine if these cross-sectional differences reflect hypertrophic changes in amygdala volumes among those reporting the highest and lowest levels of discrimination. Overall, these findings suggest complex relations of discrimination to the amygdala and warrant further consideration of the amygdala as a neurobiological substrate in the discrimination-disease linkage.

Symposium 1667

New insights into the role of personality processes for sleep

Thursday, March 12 from 11:45 am to 12:45 pm

NEW INSIGHTS INTO THE ROLE OF PERSONALITY PROCESSES FOR SLEEP

Katherine A. Duggan, PhD, Department of Psychology, North Dakota State University, Fargo, ND, Zlatan Krizan, PhD, Department of Psychology, Iowa State University, Ames, IA, Garrett Hisler, PhD, Department of Psychiatry, University of Pittsburgh, Pittsburgh, PA, Danica Slavish, PhD, Department of Psychology, University of North Texas, Denton, TX, Darlynn M. Rojo-Wissar, MPH, Department of Public Health, Johns Hopkins University, Baltimore, MD

Personality and sleep are both related to consequential outcomes, including psychological well-being, cardiovascular and inflammatory biomarkers, physical health, and mortality risk. However, little research attempts to integrate both of them. We present new insights on the dynamics of personality and sleep using multilevel, multimethod self-report, daily diary, and behavioral (actigraphy) measures. The first abstract examines dynamics in personality states and sleep states using daily diaries, finding conscientious (planful, self-controlled, and organized) states predict better next day sleep, but better sleep also predicts next day personality states. Using actigraphy, the second abstract finds roles for trait conscientiousness and openness to experience in daily (averaged) sleep, but also sleep variability. The third abstract highlights associations between self-reported trait neuroticism (negative affect and emotional lability), conscientiousness, and extraversion (positive affect and sociability) with daytime sleepiness and insomnia in older adults. These state-of-the-art studies highlight possible roles of personality traits and processes for sleep (and vice versa) across the lifespan, with implications for models linking personality and sleep with consequential health outcomes. Personality can be used to identify individuals at risk for poor sleep, and personality-informed interventions can be designed to improve both sleep and public health.

Individual Abstract Number: 1670

The dynamics between personality states and sleep

Garrett Hisler, PhD, Department of Psychiatry, University of Pittsburgh, Pittsburgh, PA, Zlatan Krizan, PhD, Department of Psychology, Iowa State University, Ames, IA

Personality traits have been linked with sleep, yet the direction of this relation is unclear. To advance the understanding of how traits are related to sleep behavior, this study used data from 40 students in the Dartmouth Student Life Study who completed daily diary assessments of the Big-5 personality states and sleep over a semester (total day $n = 297$). Multilevel modeling was used to examine if personality states expressed during the day predicted nightly sleep, and if nightly sleep predicted the expression of personality states the next day. Being more dependable and self-disciplined on a given day predicted longer sleep and better quality sleep the following night, while no other personality states predicted sleep. In contrast, sleep quality predicted next day expression of multiple personality states. Higher sleep quality predicted being less anxious and upset, being more organized and careful, and being more extraverted and enthusiastic the next day. Sleep duration did not predict personality states. The findings suggest bidirectional associations between sleep and personality states, while highlighting the importance of sleep for personality expression.

Individual Abstract Number: 1672

Beyond the mean: Personality, social jetlag, and night-to-night variability in sleep

Danica Slavish, PhD, Brett Messman, BA, Camilo Ruggero, PhD, Department of Psychology, University of North Texas, Denton, TX, Daniel Taylor, PhD, Department of Psychology, University of Arizona, Tuscon, AZ, Jessica Dietch, PhD, Psychology, Stanford University, Stanford, CA, Sophie Wardle-Pinkston, MS, Department of

Psychology, University of Arizona, Tuscon, AZ, Kimberly Kelly, PhD, Psychology, University of North Texas, Denton, TX

Low conscientiousness and high neuroticism are linked to increased risk for insomnia and short sleep duration. Yet sleep fluctuates substantially from night-to-night, particularly in individuals with rotating work schedules and high levels of stress (e.g., nurses). Most previous work on personality and sleep has not considered the role of this night-to-night variability in sleep (i.e., intraindividual variability [IIV]). Recent studies have shown that greater IIV in sleep is related to depression, anxiety, cardiovascular risk factors, and dysregulated cortisol, even controlling for mean sleep. Yet few studies have examined the role of personality in IIV in sleep, particularly using both subjective and objective markers of sleep. To address these gaps, we examined whether mean and IIV in sleep, as well as social jetlag (discrepancy between workday/non-workday sleep) were associated with personality in 401 nurses (92% female; $M_{age} = 39.5$). Nurses completed the Big Five Inventory-2 followed by 14 days of prospective sleep diaries and actigraphy to assess total sleep time (TST), sleep efficiency (SE; TST divided by time in bed), circadian midpoint (CM; midpoint of bedtime/waketime) and social jetlag (i.e., discrepancy between the average CM of workday/non-workday sleep). Higher conscientiousness was associated with longer mean TST (actigraphy: $\beta = 0.25$, $p = .003$; diary: $\beta = 0.18$, $p = .03$) and greater mean SE (actigraphy: $\beta = .89$, $p = .01$; diary: $\beta = 0.85$, $p = .01$), but also greater IIV in diary SE ($\beta = .79$, $p = .01$). Openness to experience was associated with later CM (actigraphy: $\beta = .33$, $p = .02$; diary: $\beta = .24$, $p = .06$), lower mean diary TST ($\beta = -.15$, $p = .05$), lower mean diary SE ($\beta = -.71$, $p = .03$) and marginally more social jetlag determined by actigraphy only ($\beta = .30$, $p = .06$). Higher conscientiousness may reflect better adaptation to changing situational demands, and greater openness to experience may reflect willingness to engage in activities that disrupt sleep. Future studies should consider under what circumstances and for whom IIV in sleep may be adaptive or harmful. Potential implications for informing person-centered sleep interventions will be discussed.

Individual Abstract Number: 1675

Associations between personality traits and sleep in the Baltimore Longitudinal Study of Aging

Darlynn M. Rojo-Wissar, MPH, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, Amal A. Wanigatunga, PhD, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health; Johns Hopkins Center on Aging and Health, Baltimore, MD, Eleanor M. Simonsick, PhD, National Institute on Aging, Intramural Research Program Program, Bethesda, MD, Antonio Terracciano, PhD, National Institute on Aging, Intramural Research Program Program, Baltimore, MD; Department of Geriatrics, Florida State College of Medicine, Tallahassee, FL, Mark N. Wu, MD, PhD, Department of Neurology, Solomon Snyder Department of Neuroscience, Johns Hopkins University School of Medicine, Baltimore, MD, Vadim Zipunnikov, PhD, Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health; Johns Hopkins Center on Aging and Health, Baltimore, MD, Jennifer A. Schrack, PhD, Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, Sharmin Hossain, PhD, National Institute on Aging, Intramural Research Program, Bethesda, MD, Paul T. Costa, PhD, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, Adam P. Spira, PhD, Department of Mental Health, Johns Hopkins University; Johns Hopkins Center on Aging and Health; Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD

Personality traits and sleep disturbance both are linked to morbidity and mortality. We studied 1,079 well-functioning older adults aged 60-97 enrolled in the Baltimore Longitudinal Study of Aging and investigated cross-sectional associations of personality traits with insomnia symptom severity and daytime sleepiness. Personality was measured using the NEO Personality Inventory-Revised, insomnia symptom severity with the Women's Health Initiative Insomnia Rating

Scale, daytime sleepiness using the Epworth Sleepiness Scale, and depressive symptoms using the Center for Epidemiologic Studies-Depression Scale. After adjusting for age, sex, race, education, and depressive symptoms, higher neuroticism was associated with greater insomnia severity ($\beta = 0.05$, 95% CI 0.02, 0.09) and sleepiness ($\beta = 0.10$, 95% CI 0.06, 0.14), whereas higher conscientiousness was associated with lower insomnia severity ($\beta = -0.04$, 95% CI -0.07, -0.01) and sleepiness ($\beta = -0.06$, CI: -0.10, -0.03). Higher extraversion was only associated with lower insomnia severity ($\beta = -0.03$, CI: -0.06, -0.003). Results suggest that personality may influence health in part by affecting sleep.

Symposium 1740

Gendered Adrenals and Guts?: Sex & Gender-Roles In Relation to Cortisol Reactivity and Microbiome Health

Friday, March 13 from 2:45 to 4:00 pm

GENDERED ADRENALS AND GUTS?: SEX & GENDER-ROLES IN RELATION TO CORTISOL REACTIVITY AND MICROBIOME HEALTH

Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, Peggy Zoccola, PhD, Psychology, Ohio University, Athens, OH, Andrew W. Manigault, MS, Psychology, Ohio University, Athens, OH, Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, Erik L. Knight, PhD, Center for Healthy Aging, Penn State University, University Park, PA, Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada

Biological sex and socio-cultural gender are powerful predictors of stress, health, and disease. Sex is determined by genes, anatomy, gonads, and hormones, whereas gender represents a spectrum of socio-cultural roles, identities, and orientations that are distinct from one's sex. Recently, there has been great interest in teasing apart the role of sex versus gender in stress research, inflammation, and other disease states.

In this symposium, four presentations will link sex and gender-roles to cortisol reactivity, inflammation and depression, and the gut microbiome. First, Juster et al. will present findings linking gender-roles (masculinity, femininity, and androgyny) to cortisol reactivity. Second, Manigault et al. will present findings linking gender-roles to cortisol habituation. Third, Knight et al., will provide evidence of gender differences in depressive symptoms and inflammatory responses related to the gut microbiome. And finally forth, Juster et al. will review literature on stress and sex/gender as they related to the 'micro-sexome'.

Individual Abstract Number: 1747

MASCULINITY, FEMININITY AND REPEATED STRESSORS: ARE GENDER ROLES ASSOCIATED WITH CORTISOL HABITUATION?

Andrew W. Manigault, MS, Psychology, Ohio University, Athens, OH, Ryan C. Shorey, PhD, Psychology, University of Wisconsin-Milwaukee, Milwaukee, WI, Katrina R. Hamilton, PhD, Psychological Science, University of California Irvine, Irvine, CA, Matt C. Scanlin, MS, Psychology Department, Peggy Zoccola, PhD, Psychology, Ohio University, Athens, OH

Sex differences are reliably documented in relation to health and illness. Yet only few studies differentiate the effects of biological sex from those of gender roles on disease risk markers. Moreover, no prior work has examined the effects of gender role endorsement on repeated stress response patterns. To address this knowledge gap, the present study tested the association between gender role endorsement and cortisol habituation to repeated stress as part of a larger study examining the effects of stress management interventions on cortisol habituation to repeated stress.

Participants (138 adults reporting moderate to high perceived stress, aged 18-50, 62% female) completed a baseline survey assessing gender role endorsement using the Bem Sex Role Inventory, from which 4 gender role groups were derived: masculine, feminine, androgynous (high masculinity, high femininity), and undifferentiated (low masculinity, low femininity). Following the stress management intervention, participants completed the Trier Social Stress Test on two laboratory visits (48 h apart). Salivary cortisol was assessed 0, 25, 35, and 60 minutes post-stressor during both laboratory visits and log transformed prior to analysis. Habituation was conceptualized as the change in cortisol output from visit 1 to visit 2.

The interaction of masculinity x femininity x visit was significant when predicting total cortisol, $F(1,581)=17.27$, $p<.001$. Follow up contrasts revealed that the androgynous and undifferentiated groups exhibited a larger decrease in total cortisol from visit 1 to visit 2 than the feminine group ($b=-.275$, $t(581)=2.77$, $p=.005$, $b=-.387$, $t(581)=4.07$, $p<.001$, respectively) and the masculine group ($b=-.187$, $t(581)=1.87$, $p=.062$, $b=-.299$, $t(581)=3.11$, $p=.002$, respectively). No other contrasts were significant.

The interaction of masculinity x femininity x visit remained significant after controlling for sex, wake time, experiment start time, and study conditions ($F(1,559)=22.15$, $p<.001$). Finally, interactions of sex x visit and sex x masculinity x femininity x visit were non-significant (all $ps > .16$).

Feminine and masculine gender roles were associated with less cortisol habituation than either undifferentiated or androgynous gender roles. In contrast, biological sex was unrelated to cortisol habituation. Results imply that gender roles may contribute to stress-related processes.

Individual Abstract Number: 1755

GENDER-ROLES MODULATE CORTISOL STRESS REACTIVITY

Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, Jens C. Pruessner, PhD, Psychology, University of Konstanz, Konstanz, NA, Germany, Sonia J. Lupien, PhD, Psychiatry, University of Montreal, Montreal, QC, Canada

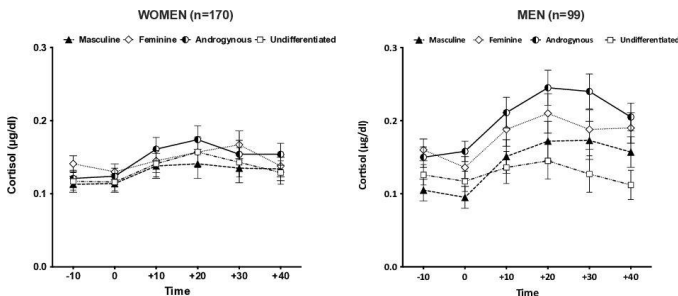
Studying sex differences provides unique insights into stress processes that contribute to sex-specific disease trajectories. In stress reactivity studies, men tend to show greater cortisol reactivity to performance-based stressors than women, whereas women appear to be more biologically sensitive to social rejection and tend to report more distress on psychosocial questionnaires. Beyond biological sex (binary male/female, sex hormones like testosterone, estradiol, and progesterone), socio-cultural gender refers to the roles, orientations, identities, and behaviors attributed to but still distinct from sex. Gender socialization leads to the development of gender roles or personality stereotypes we assimilate and endorse via the enactment of masculine or feminine behaviors.

In the 1970s, Bem proposed that "androgynous" individuals with high masculinity and high femininity were in the best psychological health because they could adapt flexibly to different contexts. By contrast, "undifferentiated" individuals would show below-average propensities of either masculinity or femininity that she proposed was the most maladaptive profile. To date, very little research has applied biological approaches to investigate gender-roles in stress reactivity. We hypothesized that gender-roles would be associated with distinct patterns of cortisol reactivity over and above sex and sex hormone effects.

We combined data from three studies into a pooled sample of 269 healthy adults (170 women and 99 men) between 18 to 72 years old ($M=36.60$, $SE=.73$). Each participant completed the 30-item Bem Sex Role Inventory and provided saliva samples to measure cortisol at 6 moments as part of the panel-out version of Trier Social Stress Test. An additional saliva sample was used to assess testosterone, estradiol, and progesterone for each participant.

Repeated measures ANCOVAs revealed significant group differences by gender-role classification ($F(3,256)=2.86$, $p=.037$). Tukey post-hoc

analyses disaggregated by sex showed that androgynous men produced more overall cortisol than undifferentiated men ($p=.049$). No significant sex effects or sex X gender-role interactions were detected. In addition, several covariation effects were found for group differences in testosterone ($F_{(1,256)}=11.53$, $p=.001$) and estradiol ($F_{(1,256)}=4.20$, $p=.041$) as well as interaction effects for time X testosterone ($F_{(2,38,609)}=3.10$, $p=.037$) and time X estradiol ($F_{(2,38,609)}=3.10$, $p=.029$). In summary, higher testosterone and lower estradiol is correlated with increases in and production of cortisol. Contrary to our hypothesis, androgynous men showed higher cortisol concentrations than undifferentiated men. Previous work by our group has shown that androgynous men actually show lower allostatic load representing healthier neuroendocrine, immune, metabolic, and cardiovascular functioning. In addition, for both sexes, androgyny has been linked with better mental health, self-esteem, and less psychiatric symptoms. In light of these findings, amplified cortisol reactivity among androgynous men shown here may be an adaptive pattern.



Individual Abstract Number: 1827

GENDER DIFFERENCES IN THE LINK BETWEEN DEPRESSIVE SYMPTOMS AND EX VIVO INFLAMMATORY RESPONSES ARE ASSOCIATED WITH MARKERS OF ENDOTOXEMIA

Erik L. Knight, PhD, Center for Healthy Aging, Marzieh Majd, PharmD, Biobehavioral Health, Penn State University, University Park, PA, Jennifer Graham-Engeland, PhD, Joshua Smythe, PhD, Biobehavioral Health, Martin Sliwinski, PhD, Center for Healthy Aging, Penn State University, University Park, PA, Christopher G. Engeland, PhD, Biobehavioral Health, Penn State University, University Park, PA

Depressive symptoms are linked with higher inflammation and inflammatory responses, though these associations are not always consistent. In a recent study ($n=160$, 25-65 years, 67% women), our group reported gender differences relevant to this association: Men's depressive symptoms were related to heightened *ex vivo* inflammatory responses to lipopolysaccharide (LPS), whereas women's depressive symptoms were related to attenuated responses. We investigated markers of endotoxemia (the presence of endotoxins in blood, presumably as a result of bacterial translocation from the gut) as factors that elicit gender-dependent immune responses that may be associated with links between depressive symptoms and inflammation. In the same sample as our previous report, inflammatory responses were examined via a composite index of LPS-stimulated cytokines in whole blood. The ratio of LPS-binding protein to soluble CD14 receptor (LBP:sCD14) was examined as an index of endotoxemia.

At lower levels of LBP:sCD14, gender differences were absent; men and women each demonstrated weak, negative associations between depressive symptoms and stimulated cytokines. However, with increasing levels of endotoxemia, men displayed an increasingly positive association and women displayed an increasingly negative association between depressive symptoms and inflammation. Hence, endotoxemia appeared to contribute to gender differences in the link between depressive symptoms and inflammatory responses ($B=-0.039$, 95%CI[-0.068,-0.009], $p=0.010$). These results provide a novel perspective on gender and risk factors for depression-linked alterations in inflammation, which may help to determine susceptibility to the downstream physical consequences of depressive symptomatology.

Individual Abstract Number: 1833

STRESS AND THE 'MICRO-SEXOME': ALLOSTATIC LOAD AND SEX/GENDER CONSIDERATIONS

Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, L. Zachary DuBois, PhD, Anthropology, University of Oregon, Eugene, OR, Christian Baron, PhD, Biochemistry, University of Montreal, Montreal, QC, Canada

Research on the functional significance of the gut microbiome – the micro-organisms living in our intestinal system – is an exciting new frontier in human physiology. The gut-microbiome-brain network links our brain to our gut via bacterial metabolism, sex hormones, and immune signals. In addition, stress hormones like cortisol disrupt the gut microbiome. To date, the gut microbiome has received limited integration within the allostatic load model of chronic stress linked to numerous health conditions. This is an important consideration since the gut microbiome is connected to numerous health problems like depression and auto-immune diseases that differ by biological sex and perhaps also by socio-cultural gender.

Recently, the 'micro-genderome' (or more accurately the 'micro-sexome') has been coined to represent the interactions between microbes, sex hormones, and the immune system. Indeed, males/men, females/women, and gender diverse people may differ in their gut microbiome profiles. In the general population, cisgender men appear to show more healthy diversity in gut bacterial populations than cisgender women. This is thought to be mediated by testosterone; however, much more research is needed while also integrating other stress mediators like cortisol functioning and allostatic load indices. To date, the microsexome has received limited study in humans using a socio-cultural gender lens such as in relation to gender-roles, gender identity, sexual orientation, and gender behaviors. Factors like diet, drinking, and drugs also influence sex- and gender-based modulation of microbiome diversity. Many of these health behaviors are gendered in that they differ between men, women, and gender diverse people. In this presentation, we will review existing literature from animals and humans that link stress to the 'micro-sexome'. We will integrate advances in gut microbiome research in application to better understanding stress-related neuroendocrine, immune, metabolic, and cardiovascular functioning to refine the allostatic load model. Lastly, we will propose methodologies for including biological sex and socio-cultural gender measures in human studies of the gut microbiome and allostatic load.

Symposium 1745

Effects of Communal Coping on Health Across Stressful Contexts: Causal Links and Boundary Conditions

Saturday, March 14 from 3:15 to 4:30 pm

EFFECTS OF COMMUNAL COPING ON HEALTH ACROSS STRESSFUL CONTEXTS: CAUSAL LINKS AND BOUNDARY CONDITIONS

Melissa Zajdel, M.S., Psychology, Carnegie Mellon University, Pittsburgh, PA, Melissa Zajdel, M.S., Psychology, Carnegie Mellon University, Pittsburgh, PA, David Sbarra, Ph.D., Psychology, University of Arizona, Tucson, AZ, Emma Bright, Ph.D., Psychology, UCLA, Bellevue, WA, Kelly Rentscher, Ph.D., Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, Los Angeles, CA, Vicki S. Helgeson, Ph.D., Psychology, Carnegie Mellon University, Pittsburgh, PA

There is increasing recognition that individuals do not cope with stress in isolation, but rather network members are both affected by the stressor and can aid in the coping process. One interpersonal theory of coping that has gained recent attention is communal coping, which consists of a shared stressor appraisal and collaborative behaviors undertaken to manage the stressor (Lyons et al., 1998; Helgeson et al., 2018). This symposium seeks to examine the effects of communal coping on relationship and health outcomes across a range of stressors

including a laboratory stressor, daily stressors, relational conflict, and a chronic illness. We have three goals in this symposium. First, we examine the impact of shared appraisal, as this component of communal coping distinguishes it from other interpersonal coping theories. One presentation explores the role of a shared appraisal and effects on health outcomes in the context of daily stressors, and another presentation manipulates shared appraisal in the context a laboratory stressor to determine effects on collaboration and coping outcomes. Second, because much of the previous research on communal coping is correlational, this symposium tackles the causality issue by manipulating communal coping in the context of friendship dyads, relationship conflict, and couples in which one person has pre-diabetes and examining effects on relationship, psychological distress, and physiological outcomes. Third, this symposium aims to explore boundary conditions of communal coping by identifying contexts in which it is more and less helpful (e.g., communion personality) with respect to health outcomes. The discussion will synthesize the results with respect to these issues and outline a set of avenues for future research in this area.

Individual Abstract Number: 1748

An Experimental Approach to Communal Coping

Melissa Zajdel, M.S., Vicki S. Helgeson, Ph.D., Psychology, Carnegie Mellon University, Pittsburgh, PA

Communal coping is an interpersonal form of coping that consists of a shared appraisal of a problem and collaborative behaviors to address it (Lyons et al., 1998; Helgeson et al., 2018). Communal coping has been linked to less psychological distress, greater relationship quality, and improved illness specific outcomes across a variety of stressful contexts (e.g., Zajdel et al., 2016). However, the vast majority of research on communal coping—and interpersonal coping more broadly—is cross-sectional, and even longitudinal data make it difficult to establish causal links of communal coping to outcomes. The primary goal of the present study was to manipulate communal coping in the laboratory in the context of friend dyads facing a stressor. Because communal coping research has emphasized the collaboration over the shared appraisal component, the focus of this study was to isolate the effect of shared appraisals on outcomes by manipulating whether dyads viewed a stressor as shared or individual. Friend dyads ($n = 64$ dyads; 128 individuals) were randomly assigned to view a modified version of the Trier Social Stress Task as either a shared or an individual problem. Dyad members in both groups were separated but allowed to collaborate via instant messaging. Results showed that we successfully manipulated how the problem was appraised in both members. Importantly, the stressed individual in the shared appraisal condition reported greater collaboration, support received, partner responsiveness, friendship intimacy, and positive mood after the stressor compared to those in the individual appraisal condition. Partners in the shared appraisal condition also reported more support, partner responsiveness, higher friendship intimacy, and more positive mood compared to those in the individual appraisal condition. An analysis of transcripts from the communications revealed greater problem solving, support provision, and collaboration in the shared appraisal than the individual appraisal condition. This is the first study to demonstrate causal links of the shared appraisal component of communal coping to positive relationship, support exchanges, and mood outcomes. These findings can be used to design interventions for couples coping with stressful life events by demonstrating that instilling a shared appraisal can lead to positive relationship and health outcomes.

Individual Abstract Number: 1752

Using Family Consultation (FAMCON) to Prevent Type 2 Diabetes: A Pilot Study to Alter Communal Coping

David Sbarra, Ph.D., Manvelian Atina, MA, Bonita Sur, MA, Psychology, University of Arizona, Tucson, AZ, Mark Whisman, Ph.D., Psychology and Neuroscience, University of Colorado-Boulder, Boulder, CO

The global rise of type 2 diabetes is a public health emergency that calls for the development of innovative, effective, and scalable

evidence-based prevention programs. This talk introduces the FAMCON for Prediabetes Program, a health behavior change program designed for adult couples in which at least one member has prediabetes. The goals for the talk are to introduce the rationale behind FAMCON and to discuss descriptive findings from our pilot/feasibility work on the intervention's development. Health behaviors occur in a social context and to create sustainable health behavior change, behavioral interventions must attend to the relationship dynamics (i.e., interpersonal interactions) that are embedded in this context. The existing database for behavioral lifestyle interventions suggests that many programs can reduce weight, improve diet, and increase physical activity in the short-term, but it is difficult to achieve sustained behavioral changes that maintain weight loss, the primary target of intervention for reducing type 2 diabetes risk. The promise of the FAMCON for Prediabetes Program is the potential to promote sustainable health behavior change by targeting specific relationship dynamics. This talk focuses on the communal coping dimension of FAMCON, where we encourage couples to view prediabetes as a problem to solve cooperatively. The consultant builds a communal-coping couple orientation that (a) views unhealthy behaviors as "our" (rather than "yours" or "mine") problem and (b) translates this view into ways in which partners can work together toward behavior change (or problem resolution). We have completed feasibility work with four couples ($N = 8$ total participants) and will present pilot descriptive data on their receptiveness to FAMCON as well as their self-reported perceptions of communal coping. Three of the four couples completed the entire 6-session protocol, and among those who completed five of the six people reported viewing the prediabetes as "our shared problem" by the end of the program. We discuss the specific intervention techniques FAMCON consultants use to promote communal coping, including a "family values" exercise couples complete together, and why a couples-based intervention is a timely contribution to diabetes prevention more broadly.

Individual Abstract Number: 1759

An Experimental Manipulation of Communal Appraisal and Coping Intentions in Young Adults

Emma Bright, Ph.D., Psychology, UCLA, Bellevue, WA, Annette L. Stanton, Ph.D., Psychology, UCLA, Los Angeles, CA

Background: The construct of communal coping involves two processes: an appraisal of the stressor as shared and cooperative efforts to manage the stressor. The present study tested the effects of induced communal appraisal and coping intentions on relevant psychosocial, physiological, and behavioral outcomes as well as moderators (dispositional communion, attitudes toward emotional expression). **Method:** Adults in an intimate relationship ($N = 133$) were randomized to write about a conflict in their relationship from a communal perspective as the couple's problem (CC), a non-communal perspective as the participant's problem (NC-O), or a non-communal perspective as the partner's problem (NC-P) over two sessions. Participants completed measures within each writing session and one week prior to and following the writing sessions. **Results:** Condition produced a statistically significant effect on change in state partner-directed negative affect from Session 1 pre-induction to Session 2 post-induction, with greater decreases in state partner-directed negative affect for CC as compared to NC-P. CC participants had increases in physical symptoms, whereas NC-P participants had decreases in self-reported physical symptoms. Condition had no significant effect on relationship satisfaction, heart rate reactivity or recovery, and sleep. Dispositional communion significantly moderated the effect of condition on within-session state individual negative affect and perceived stress, as well as perceived stress at one-week follow-up, such that participants with greater dispositional communion in CC experienced greater improvement on those variables than did participants in NC-P or NC-O. Attitudes toward emotional expression significantly moderated the relationship between condition and change in alcohol use from baseline to follow-up, NC-P participants with more positive attitudes toward emotional expression had greater increases in alcohol use from baseline to follow-up than CC

participants. **Conclusions:** The findings suggest that experimentally-induced communal appraisal and coping intentions may prove useful during relationship conflicts, particularly by buffering against negative affect, and perceived stress. However, induced communal coping produced an increase in physical symptoms, and further research is needed to examine the potential costs of communal appraisal.

Individual Abstract Number: 1760

Couples' *we*-ness buffers the effects of perceived stress on physical health functioning in midlife parents

Kelly Rentscher, Ph.D., Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, Rena L. Repetti, Ph.D., Theodore F. Robles, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA

A growing literature suggests that couples' sense of togetherness, or *we*-ness, can positively impact relationships and individual health. Conceptually, in the face of stress, couples' *we*-ness translates into a communal approach to coping in which partners view a stressor as *ours* rather than *yours* or *mine* and work together to address it. *We*-ness may therefore play an important role in buffering the negative effects of stress on health. Several studies have assessed couples' first person plural pronoun use (*we*-talk) as a linguistic marker of *we*-ness, and linked it to effective joint problem solving, lower physiological activation during conflict and better adjustment to breast cancer. This study aimed to extend these findings by validating *we*-talk in a sample of parents facing common stressors during midlife and examining the stress-buffering effects of *we*-ness on physical health. In a cross-sectional design, 66 parents ($M_{age}=43$; 56% female; 33% White, 21% Latino, 18% Black, 14% Asian) completed a chronic stress interview, questionnaires to assess perceived stress (PSS) and physical health functioning (SF-12), and daily reports of marital interactions for 8 weeks. *We*-talk was derived from transcripts of parents' speech during the marital component of the stress interview via computerized text analysis. Results provided evidence of construct validity, as *we*-talk correlated with less first-person singular pronoun use during the interview ($r=-.26, p=.04$), greater relationship satisfaction ($r=.42, p<.001$), daily partner responsiveness ($r=.33, p<.001$), affection ($r=.43, p<.001$) and closeness ($r=.47, p<.001$), and satisfaction with life ($r=.28, p=.03$), as well as less daily marital conflict ($r=-.32, p=.01$) and loneliness ($r=-.30, p=.02$). A random intercept model covarying for age, sex, race, BMI, and medication use revealed that *we*-talk moderated the association between perceived stress and physical health ($b=0.23, p=.045$, 95% CI [0.01, 0.45]), such that greater stress was associated with poorer physical health functioning for parents with low ($-1 SD; b=-0.79, p=.001$) but not high ($+1 SD; b=-0.02, p=.94$) *we*-talk, with a clinically meaningful group difference. Findings extend previous work by validating *we*-talk in the context of a chronic stress interview and identifying *we*-ness as a protective buffer against the effects of stress on physical health in midlife.

Symposium 1806

Understanding discrimination in the context of the generalized unsafety theory of stress

Friday, March 13 from 4:15 to 5:30 pm

UNDERSTANDING DISCRIMINATION IN THE CONTEXT OF THE GENERALIZED UNSAFETY THEORY OF STRESS

Amanda M. Acevedo, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Christopher K. Marshburn, PhD, Psychology, University of Kentucky, Lexington, KY, Josiah Sweeting, M.A., Psychological Science, University of California, Irvine, Irvine, CA, DeWayne P. Williams, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Amanda M. Acevedo, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Julian F. Thayer, PhD, Psychological Science, University of California, Irvine, Irvine, CA

The generalized unsafety theory of stress (GUTS) posits that common conditions of one's body (e.g., obesity), social networks (e.g., loneliness), and context (e.g., stressful events) can contribute to perceptions of unsafety and, in turn, reduced vagally-mediated heart rate variability (vmHRV; an index of cardiac parasympathetic activity). Such a reduction in vmHRV is evolutionarily adaptive for those in unsafe environments because it reduces the inhibition of the default stress response, allowing the individual to quickly respond to threats and increase chances of survival. However, over time individuals with low resting vmHRV are at increased risk for both physical and mental illness including cardiovascular disease and anxiety disorders. One factor that may signal an unsafe world for U.S. minority groups is racial/ethnic discrimination, or negative treatment of individuals based on their racial/ethnic background. The four talks in this symposium will present studies examining the association between discrimination and vmHRV in different samples. The first speaker will present research that examines the influence of recalling and discussing an experience of discrimination with a friend on African American vmHRV. The second speaker will show how rumination and sex can alter the association between perceived discrimination and vmHRV in African Americans. The third speaker will demonstrate how the association between perceived discrimination and vmHRV is not always linear and could, in fact, be quadratic in African American samples. The final speaker will present data exploring psychosocial factors (including perceived discrimination) associated with vmHRV within a Latino sample. To conclude the symposium, the discussant will synthesize how these findings contribute to our understanding of GUTS and the implications for future work in this area. Together, these talks will highlight the importance of incorporating GUTS into research on cardiovascular health disparities.

Individual Abstract Number: 1808

Examining cardiovascular reactivity in Black Americans when recalling experiences of racial discrimination

Christopher K. Marshburn, PhD, Psychology, University of Kentucky, Lexington, KY, Amanda M. Acevedo, PhD, Psychological Science, Belinda Campos, PhD, Chicano/Latino Studies, University of California, Irvine, Irvine, CA

How do Black Americans' heart rate variability change when talking about an experience of racial discrimination? Racial discrimination is a pervasive life stressor for Black Americans, and it is associated with increased cardiovascular reactivity. However, little research has examined how Black Americans cope with racism. Some research has found that talking to a friend is a common coping response among Black Americans after experiencing racism. The findings as to whether talking to someone about an experience of racial discrimination is helpful for Black Americans' psychological well-being is equivocal; however, there is some evidence that talking about the experience reduced the association between blood pressure and perceived racism. Although, there is at least one study that demonstrates talking about experiences of racial discrimination is associated with increased blood

pressure for Black Americans who experience high levels of racism. Given the contradictory findings and scant research investigating how talking about experiences of racism affects Black Americans' cardiovascular physiology, we conducted a study examining how Black Americans' heart rate variability changed when talking about an experience of racial discrimination. Using measurements of heart rate and respiratory sinus arrhythmia (RSA)—an index of the vagus nerve's ability to inhibit the cardiovascular stress response—we had forty-six dyads ($N = 92$ participants), where at least one person in the dyad racially identified as Black/African American, have a 10-minute conversation about a personal experience of racial discrimination. Preliminary analyses revealed increases in Black participants' heart rate from baseline measurements to when they talked about racial discrimination, $t(41) = -4.64, p < .001, d = .72$. Although no overall changes in RSA were detected from baseline to discussing discrimination, we did find that for participants with low compared to high RSA (as calculated using median split), RSA increased from baseline to discussing discrimination, $t(17) = -2.62, p = .018, d = .62$. These findings, although preliminary, suggest that talking about experiences of racial discrimination might initially be stressful and associated with increased heart rate, but they also might be beneficial to health, especially for Black Americans with lower heart rate variability.

Individual Abstract Number: 1813

Sex and Trait Rumination Moderate the Association between Resting Heart Rate Variability and Perceived Ethnic Discrimination

Josiah Sweeting, M.A., DeWayne P. Williams, PhD, Psychological Science, University of California, Irvine, Irvine, CA, LaBarron K. Hill, PhD, Psychiatry and Behavioral Sciences, Duke University, Durham, NC, Roxane Cohen Silver, PhD, Julian F. Thayer, PhD, Psychological Science, University of California, Irvine, Irvine, CA

Perceived ethnic discrimination (PED) is the degree to which one consciously perceives a negative event as discriminatory or threatening (Sellers & Shelton, 2003). Resting high-frequency heart rate variability (HF-HRV) is considered an index of emotion regulation abilities and overall health. Greater PED has been linked with lower resting HF-HRV in African Americans (AAs; Hill et al., 2017). Rumination, or the perseverative thinking over stressors, has been shown to moderate links between resting HF-HRV and PED in AAs such that lower HF-HRV was linked to higher PED only in those with higher rumination (Williams et al., 2017). Moreover, sex differences in both HRV and rumination have been reported. However, research has not explored how sex may impact links between resting HF-HRV, rumination, and PED. The current study explores a potential interaction effect of sex, rumination, and resting HF-HRV on PED in AAs. In a sample of 100 young adult AAs (62 women; mean age = 19.7 years, $SD = 2.4$ years), resting HF-HRV was assessed via electrocardiogram during a 5-minute resting-period. Rumination was measured using the Ruminative Responses Scale while everyday PED was assessed using the Perceived Ethnic Discrimination Questionnaire. Findings indicated a significant 3-way interaction ($\Delta R^2 = .029, B = -.34 (.27), 95\% CI [-.69, -.00], p = .048$) such that resting HF-HRV predicted PED and this association was moderated by both rumination and sex. For men higher in rumination, higher resting HF-HRV was associated with lower PED ($B = -8.13, (2.63), 95\% CI [-13.34, -2.91], p < .001$); this association was trending in women higher in rumination ($B = -2.41 (1.42), 95\% CI [-5.24, .41], p = .092$). In contrast, men lower in rumination showed a significant positive association such that higher resting HF-HRV was associated with higher PED ($B = 4.68, (2.05), 95\% CI [.61, 8.74] p = .024$). Study findings support work showing that variation in ER abilities as measured by resting HF-HRV are related to everyday PED in AAs. New results suggest this association is most prominent in AA men higher in trait rumination. Results also highlight lower rumination as a potential mechanism underlying previously reported positive associations between HF-HRV and PED. Additional implications regarding various types of rumination and PED will be discussed.

Individual Abstract Number: 1818

Navigating an Unsafe World: Resting Heart Rate Variability and Perceived Ethnic Discrimination in African Americans

DeWayne P. Williams, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Briana N. Brownlow, M.A., Psychology, Ohio State University, Columbus, OH, Julian F. Thayer, PhD, Psychological Science, University of California, Irvine, Irvine, CA

Ethnic discrimination (ED) remains a major societal concern in America; such an unsafe and threatening environment can produce negative outcomes for health in ethnic minority individuals (e.g., African Americans (AAs)). Perceived ED (PED), defined as consciously perceiving an event as discriminatory, can exaggerate feelings of threat and unsafety associated with ED. Resting heart rate variability (HRV), a measure of cardiac parasympathetic activity, has recently been described as an index of generalized unsafety. Our group recently reported a quadratic function between resting HRV and PED such that both lower and higher resting HRV was associated with greater PED ($n = 75$). The current study sought to replicate these findings in a larger sample of AAs ($n = 126$). Additionally, we investigated how relative levels of resting HRV, as an index of generalized unsafety, may predict the quadratic relation between resting HRV and PED. Subjects were attached to an electrocardiogram and completed a 5-minute baseline period where resting HRV (root mean of squared successive differences | RMSSD) was measured. Self-reported PED was assessed using the PED Questionnaire. Curve estimates showed a significant quadratic relationship between resting HRV and PED ($F(2,123) = 4.40, p = .014$), such that lower and higher resting HRV was associated with higher PED (U-shaped curve). High and low HRV groups were created via a median split. Results showed HRV group to moderate the association between resting HRV and PED ($\Delta R^2 = .04, B = 14.1 (6.3), [1.6, 26.6], p = .03$), such that individuals in the low HRV group showed a more negative association ($B = -6.2 (5.1), [-16.3, 3.9], p = .22$), and the high HRV group a positive association ($B = 7.9 (3.7), [.59, 15.2], p = .03$), between resting HRV and PED. In support of our previous findings, higher PED can be negatively and positively associated with resting HRV. Novel results suggest that this quadratic function may be driven by generalized unsafety, as indexed by relative levels of resting HRV. Specifically, among AAs with more generalized unsafety as indexed by lower HRV, higher resting HRV may be particularly important in decreasing PED. Individuals with lesser generalized unsafety as indexed by higher resting HRV may show higher resting HRV as compensation for an unsafe (i.e., ED) environment. Implications will be discussed.

Individual Abstract Number: 1822

Generalized Unsafety and Heart Rate Variability in a Sample of Latinos

Amanda M. Acevedo, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Vida Pourmand, B.S., Psychology, Western Washington, Bellingham, WA, Belinda Campos, PhD, Chicano/Latino Studies, Michelle Fortier, PhD, Sue & Bill Gross School of Nursing, University of California, Irvine, Irvine, CA

According to the generalized unsafety theory of stress, various biopsychosocial risk factors provide signals of safety or threat to the body which helps to create a physiological state that will adequately address the demands of the environment. One measure of how flexibly one's cardiovascular system can respond to stress is vagally-mediated heart rate variability (vm-HRV; an index of the parasympathetic influence on the cardiovascular system) with increased resting vm-HRV representing greater ability to flexibly respond to stress. Past research has demonstrated a negative association between perceived ethnic discrimination and vm-HRV in African American samples suggesting discrimination signals an unsafe world for African Americans and that this unsafety is associated with decreased vm-HRV. However, no such work to date has examined whether this association exists in Latino samples. Thus, the current study examined the direct association between perceived ethnic discrimination and vm-HRV in Latinos and explored potential factors that may moderate the

link between discrimination and vm-HRV (e.g., anxiety sensitivity, neuroticism, social desirability) in Latinos. One-hundred-twenty-two undergraduate students (82.8% female; $M_{age}=20.33$, $SD=3.31$) who self-identified as being of Chicano/Latino background participated in a larger study on pain. Electrocardiography was measured continuously using Lead II configuration and resting vmHRV (measured via log transformed root mean square of successive differences) was assessed while participants sat quietly for five minutes. Later during the study, participants completed the Perceived Ethnic Discrimination Questionnaire- Community Version, Big Five Inventory- Neuroticism subscale, and the Marlow-Crowne Social Desirability Scale. Results indicated that in this Latino sample, perceived ethnic discrimination was not associated with RMSSD, $r = -.029$, $p = .756$, and no factors altered this. Independently, neuroticism was negatively associated with RMSSD, $r = -.199$, $p = .036$, and this association appeared to be robust in Latinas particularly. The implications of these findings in light of the generalized unsafety theory of stress will be discussed.

Symposium 1036

Biobehavioral influences on epigenetic aging

Friday, March 13 from 2:45 to 4:00 pm

BIOBEHAVIORAL INFLUENCES ON EPIGENETIC AGING

Kelly E. Rentscher, Ph.D., Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, Los Angeles, CA, Kelly E. Rentscher, Ph.D., Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, Los Angeles, CA, David A Sbarra, Ph.D., Psychology, University of Arizona, Tucson, AZ, Erika J. Wolf, PhD, Psychiatry, National Center for PTSD at VA Boston Healthcare System and Boston University School of Medicine, Boston, MA, Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, Psychiatry & Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA, Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, Los Angeles, CA

This symposium brings together innovative research on the 'epigenetic clock', a novel measure of biological age based on DNA methylation of distinct genomic regions. This measure estimates an individual's epigenetic age compared to their chronological age. Recent research suggests that several estimates of epigenetic age are associated with a number of age-related diseases, predict all-cause mortality, and can be influenced by health behaviors such as diet, exercise, and smoking. Together, these presentations showcase new research across laboratory and real-world settings and a diverse set of populations, to identify behavioral factors that relate to epigenetic age acceleration. Rentscher will present data on how psychological stress among midlife parents, especially in the context of poor marital relationship quality, is associated with accelerated epigenetic age. Sbarra will present data that links objectively assessed daily social behaviors, such as social isolation, to epigenetic age acceleration in adults undergoing marital separation and divorce. Wolf will present data from a sample of military veterans on how the effects of PTSD and sleep disturbance on epigenetic age are moderated by variants of the *klotho* gene, which has been associated with longevity and age-related disease. Carroll will present data showing that good sleep quality may protect women from experiencing epigenetic age acceleration when undergoing treatment for breast cancer. Finally, Jude Carroll will also provide commentary and discussion on these findings and future directions in this area of research. Together, these presentations highlight the potential role of behavioral, psychological, and social experiences in epigenetic aging, and offer a novel pathway through which these processes may contribute to accelerated aging and disease risk.

Individual Abstract Number: 1465

Links between perceived stress and epigenetic aging in the context of midlife parents' relationship quality

Kelly E. Rentscher, Ph.D., Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, Rena L. Repetti, Ph.D., Theodore F. Robles, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA

Exposure to chronic stress is thought to accelerate biological aging, offering one mechanism through which stress may increase risk for age-related disease; however, less is known about protective factors such as relationship quality that may buffer the negative effects of stress on biological aging. In previous work, we found that psychosocial stress was associated with increased expression of cellular senescence marker p16^{INK4a}, a hallmark of biological aging, in midlife parents. This study aimed to extend these findings to a set of epigenetic age measures based on alterations in DNA methylation of distinct genomic regions that occur with age, and relate to morbidity and mortality risk. We also examined associations between stress and epigenetic aging in the context of couples' sense of togetherness, or *we-ness*, as a specific aspect of relationship quality. In a cross-sectional design, 64 parents ($M_{age}=43$; 53% female; 41% White, 22% Latino, 22% Black, 14% Asian) completed a chronic stress interview and reports of their perceived stress (PSS). Based on previous research, *we-ness* was assessed behaviorally via partners' first-person plural pronoun use (*we-talk*) during the marital component of the stress interview using computerized text analysis. Blood samples were used to assess established epigenetic clock measures: EEAA, IEAA, PhenoAge, GrimAge, and PAI-1. Random intercept models covarying for age, sex, ethnicity/race, BMI, and medication use revealed that couples' *we-ness* moderated the effects of perceived stress on PhenoAge ($b=-0.15$, $p=.03$, 95% CI [-0.29, -0.01]), and GrimAge ($b=-0.10$, $p=.04$, 95% CI [-0.20, -0.01]), such that greater stress was associated with epigenetic age acceleration when couples' *we-ness* was low (-1 SD; PhenoAge $b=0.39$, $p=.02$; GrimAge $b=0.21$, $p=.07$) but not high (+1 SD; PhenoAge $b=0.15$, $p=.34$; GrimAge $b=0.15$, $p=.17$). Perceived stress was also associated with EEAA ($b=0.17$, $p=.049$, 95% CI [0.001, 0.33]), but not modified by *we-ness*. IEAA and PAI-1 were not associated with perceived stress or couples' *we-ness*. Findings extend previous work by linking perceived stress, especially in the context of lower quality relationships, to accelerated epigenetic aging in middle adulthood, providing a novel mechanism to explain how stress and relationship quality might impact risk for age-related functional declines, disease, and early mortality.

Individual Abstract Number: 1048

Epigenetic Age Acceleration Following Marital Separation and Divorce: A Critical Role for Daily Social Behaviors?

David A Sbarra, Ph.D., Matthias Mehl, Ph.D., Psychology, University of Arizona, Tucson, AZ, Karen Jordan, Ph.D., Psychiatry, VA Salt Lake City Health Care System, Salt Lake City, UT, Allison Tackman, Ph.D., Department of Psychology, University of Arizona, Tucson, AZ

This paper presents proof-of-concept pilot data examining the association between objectively-assessed daily social behaviors and DNA methylation (DNAm) age acceleration (frequently referred to as epigenetic age) following the end of marriage. Many chronic diseases can be conceptualized as diseases of aging and biomarkers that represent age acceleration can provide a unique window into the degree to which psychosocial stress may potentiate cellular aging processes. We studied 45 adults ($M_{age} = 43$ years, $SD = 11$ years) who were married for an average of 12.5 years ($SD = 9$ years) and reported separating within the prior 3.7 months ($SD = 2$ months) and who provided whole blood samples for the quantification of DNA methylation. Participants also completed self-reported questionnaires about their adaptation to the separation and wore the Electronically Activated Recorder (EAR) over the course of an entire weekend. The EAR is a smartphone application that records ambient sounds in participants' daily lives, collecting data for 30 seconds every 12 minutes; the audio data was transcribed and coded to identify the percentage of time participants' spend in different activities, including time spent alone, socializing, and receiving/giving positive support.

Using Horvath's (2013) bioinformatics tool for the computation of DNAm, we found a high correlation between chronological age and DNAm ($r = .91$). The DNAm index of intrinsic epigenetic age acceleration (IEAA) was negatively associated with an social integration composite scale, an index of time spent with alone, socializing, receiving positive support, and engaged in substantive conversations), $r = -.24$; participants who engaged in more frequent daily social behaviors (as indexed by the EAR) showed less age acceleration (as indexed by IEAA). The association between EAR-assessed substantive conversations, the degree to which people engage in meaningful exchanges of information with others during the course of the study period, and IEAA was especially strong, $r = -.41$. Finally, EAR-assessed time spent with an ex-partner was positively associated with IEAA, $r = .25$. Although the results from this small sample should be considered preliminary and with caution, our paper will discuss the reasons why objectively-assessed social behaviors may be associated with epigenetic age following marital separation.

Individual Abstract Number: 1183

Synergistic Effects of Klotho and Traumatic Stress on Accelerated Cellular Aging

Erika J. Wolf, PhD, Psychiatry, National Center for PTSD at VA Boston Healthcare System and Boston University School of Medicine, Boston, MA, Mark W. Logue, PhD, Danielle Sullivan, PhD, Psychiatry, National Center for PTSD at VA Boston Healthcare System & Boston University School of Medicine, Boston, MA, Annjanette Stone, BS, Pharmacogenomics Analysis Laboratory, Central Arkansas Veterans Healthcare System, Little Rock, AR, Steven Schichman, MD, PhD, Pathology, University of Arkansas for Medical Sciences, Little Rock, AR, Regina E. McGlinchey, PhD, William Milberg, PhD, Psychiatry, VA Boston Healthcare System & Harvard Medical School, Boston, MA, Mark W. Miller, PhD, Psychiatry, National Center for PTSD at VA Boston Healthcare System & Boston University School of Medicine, Boston, MA

The klotho (*KL*) gene is known for its association with longevity and age-related diseases in both pre-clinical and clinical studies. The gene was named for the Greek goddess Clotho, who was said to have spun the thread of time. We have previously shown in both cross-sectional and longitudinal studies that psychiatric stress is associated with an acceleration in the pace of cellular aging when examined using epigenetic indices of biological age. However, the contribution of genetic vulnerability to this association has yet to be elucidated. In this study, we examined *KL* genotypes in interaction with multiple forms of traumatic stress as predictors of several indicators of biological aging: epigenetic age, inflammation (C-reactive protein; CRP), metabolic pathology, and white matter neural tract integrity in brain regions connecting frontal and limbic areas (assessed via diffusion tensor imaging). The sample comprised 309 white, non-Hispanic male and female military veterans who deployed to the Global War on Terror. After correction for multiple testing, results revealed that two *KL* variants interacted with posttraumatic stress disorder (PTSD) and sleep disturbance to predict advanced epigenetic age (peak corrected $p = .034$); the peak variant (rs9315202) was further evaluated and found to interact with PTSD to predict CRP ($p = .049$), and white matter tract integrity ($ps \leq .035$). A follow-up two-year longitudinal study in a subset of 111 of these veterans revealed that a well-known *KL* polymorphism (rs9527025) was strongly associated with *KL* methylation at cg00129557 ($p = 1.29 \times 10^{-20}$) and that it also interacted with PTSD to predict methylation at this locus ($p = .03$). Longitudinal path models revealed that this variant interacted with PTSD to predict changes in CRP levels over time via methylation at this locus ($p = .04$). Collectively, results highlight the critical role of klotho, in interaction with traumatic stress, on multiple biomarkers of cellular aging. The study identifies new genetic and epigenetic targets for future research aimed at identifying risk for accelerated aging and at developing new treatments to reverse or prevent this phenomenon.

Individual Abstract Number: 1504

Healthy Sleep Quality Protects From Accelerated Phenotypic Epigenetic Aging in Breast Cancer Survivors

Judith E. Carroll, Ph.D., Cousins Center for Psychoneuroimmunology, Psychiatry & Biobehavioral Sciences, Marcie Haydon, MS, Psychology, Steve Horvath, PhD, Human Genetics, Mary Sehl, MD, Medicine, Patricia A. Ganz, MD, Fielding School of Public Health, Medicine, and the Center for Cancer Prevention & Control Research at the Jonsson Comprehensive Cancer Center, Julianne E. Bower, PhD, Psychology, Psychiatry & Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA

Remarkable treatment success has resulted in a growing population of breast cancer survivors. However, some women experience long-term and late toxicities associated with these treatments suggesting acceleration of the aging process, while others do not. We hypothesized that getting restorative sleep may offer biological benefit and serve as a protective factor in this context, predicting that good quality sleep would be associated with less epigenetic age acceleration from pre- to post-treatment for breast cancer. Women with Stage 0-IIIa breast cancer were recruited to take part in the RISE study. Visits occurred pre- and post-treatment with radiation \pm chemotherapy or neither. Women completed questionnaires assessing sleep quality (Pittsburgh Sleep Quality Index; PSQI) and provided blood samples for epigenetic analysis. Epigenetic aging estimates were derived from 850K EPIC chip (Illumina, San Diego, CA), including Phenotypic (PEAA), Intrinsic (IEAA), and Extrinsic (EEAA) age acceleration. Healthy sleep was defined as a global Pittsburgh Sleep Quality Index (PSQI) score of ≤ 5 at baseline and/or post-treatment visits. Linear regression analyses included 80 women (ages 35-76; 72% white) with both PSQI and epigenetic data. In this cohort, 48.8% of the women reported healthy sleep quality at either one or both visits. Overall, there was an increase in EEAA ($p < .001$) and PEAA ($p < .05$) over the course of treatment. This increase was reduced among women with good sleep quality, such that good sleep quality was related to smaller increases in PEAA ($p = 0.01$), IEAA ($p = 0.02$), and EEAA ($p = .09$) in unadjusted models. In fully adjusted regression models, controlling for adjuvant therapy, breast cancer stage, race/ethnicity, age, baseline depressive symptoms, and perceived stress, women with good quality sleep exhibited less PEAA from baseline to after treatment ($B = -4.25$, $SE \pm 1.8$, $p = 0.02$) compared to women with poor sleep at both visits. No significant effects remained in the adjusted models testing change in IEAA or EEAA. Healthy sleep quality during adjuvant treatment for breast cancer is associated with less phenotypic epigenetic aging. Results point to healthy sleep as a modifiable behavioral target in breast cancer patients and survivors that might offer protection from the negative impact of treatment, and may thus benefit long term health.

Symposium 1059

Neuroscience in Psychosomatic Medicine: Linking Brain and Body to Understand Health

Friday, March 13 from 1:30 to 2:30 pm

NEUROSCIENCE IN PSYCHOSOMATIC MEDICINE: LINKING BRAIN AND BODY TO UNDERSTAND HEALTH

Keely A. Muscatell, PhD, Psychology & Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC, Thomas E. Kraynak, MS, Psychology, University of Pittsburgh, Pittsburgh, PA, Jessica J. Chiang, PhD, Department of Psychology, Georgetown University, Washington, DC, Keely A. Muscatell, PhD, Psychology & Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC, Anna Marsland, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Advancements in neuroimaging technology offer an exciting opportunity to understand how brain structure and function are linked to upstream psychological and social factors, and to downstream

physiological processes that are important for health. The new field of health neuroscience is dedicated to exploring these connections; the presentations in this symposium will highlight cutting-edge work in this area. Specifically, talks will focus on the interplay between the brain and the body as they relate to socioeconomic disparities, stress reactivity, and emotional functioning. A diversity of neuroimaging approaches that help answer questions in psychosomatic science, including functional MRI (fMRI) to assess neural activity, diffusion tensor imaging (DTI) to measure brain structural connectivity, and structural MRI to measure brain volume, will be highlighted. The first presentation will showcase results from an fMRI study investigating the association between low-grade systemic inflammation and neural responses to affective information in midlife adults. This talk will highlight how physiological processes help shape neural and psychological functioning. The second presentation will discuss exciting new research linking individual-differences in cardiovascular reactivity to acute psychological stress to brain white-matter connectivity, including implications for cardiovascular disease risk. The third presentation will address potential brain pathways contributing to socioeconomic-based health disparities, reporting results from a study examining associations between parental education, prefrontal cortex structure, and insulin resistance in a sample of adolescents. The symposium will close with a discussion of the talks by a senior expert in health neuroscience, who will synthesize the three talks and also provide a more general perspective on the utility of neuroimaging in psychosomatic medicine. Overall, this session includes a diverse group of speakers and perspectives that will provide attendees a window into recent examples of health neuroscience research while contextualizing this approach in the broader field of psychosomatic science.

Individual Abstract Number: 1479

Wired for stress: structural connectome correlates of stressor-evoked cardiovascular reactivity

Thomas E. Kraynak, MS, Anna L. Marsland, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Timothy D. Verstynen, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Psychological stressors evoke changes in cardiovascular activity, and exaggerated cardiovascular reactivity (CVR) may represent a risk factor for cardiovascular disease. Individuals differ in the patterning of autonomic outflow that affects subsequent changes in cardiac and hemodynamic activity, and individual differences in CVR further associate with activity in corticolimbic brain networks implicated in stress appraisal and physiological control. Currently unclear, however, is whether individual differences in cardiac and hemodynamic dimensions of CVR associate with white matter pathways that structurally link components of corticolimbic networks. Accordingly, the present study used diffusion tensor imaging (DTI) and data-driven analyses to map the white matter pathways associated with stressor-evoked mean arterial pressure (MAP) and heart rate (HR) reactivity. Participants (138 midlife adults; 67 women; age 30 to 51) underwent DTI, and they completed two psychological stressor tasks: a color-word Stroop task and the multisource interference task. Stressor-evoked changes in MAP and HR were measured during both stressor tasks. DTI data were reconstructed in a common stereotaxic space, and connectometry analyses were conducted to map the white matter fascicles within the local connectome that associated with changes in MAP and HR. The two tasks yielded correlated individual differences in MAP ($r = .76$) and HR ($r = .70$) reactivity. Average measures of MAP and HR reactivity were moderately correlated ($r = .39$). Connectometry analyses revealed that average MAP reactivity covaried positively with local structural connectivity in white matter fascicles linking the dorsomedial prefrontal cortex with limbic structures. In contrast, HR reactivity covaried negatively with connectivity in fascicles linking the ventromedial prefrontal cortex and limbic structures (both FDR-corrected $p < .05$). Taken together, these findings are in line with previously hypothesized roles for the dorsal and ventral medial prefrontal cortex in contributing to hemodynamic

and cardiac dimensions of CVR, respectively. Moreover, they reveal a potential neuroanatomical source of individual differences in the patterning of stressor-evoked cardiovascular reactivity, which may be implicated in linking individual differences in CVR and other psychosocial factors to cardiovascular disease risk.

Individual Abstract Number: 1637

Associations Between Low-Grade Inflammation and Neural Reactivity to Affective Information

Keely A. Muscatell, PhD, Gabriella M. Alvarez, BS, Psychology & Neuroscience, Adam Bryant Miller, PhD, Psychology & Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC, Daniel A. Hackman, PhD, School of Social Work, University of Southern California, Los Angeles, CA

Systemic inflammation is increasingly appreciated as an important predictor of health and well-being. Inflammatory challenge studies (e.g., endotoxin, typhoid vaccine) suggest that inflammation can feed back to the brain to influence neural responses to positive and negative information. However, very little work has investigated associations between systemic, low-grade inflammation and neural responses to affective information. As such, the current study examined whether naturally-occurring levels of markers of systemic inflammation (i.e., IL-6 and CRP) are associated with neural activity in brain regions implicated in processing emotion (i.e., amygdala, anterior insula, ventral striatum, dorsomedial prefrontal cortex) in response to positive, negative, and neutral images. We investigated this question in a sample of 66 adults (44 women; M age = 54.98 years, range=35-76) from the Midlife in the United States (MIDUS) study. Participants provided a blood sample that was assayed for levels of IL-6 and CRP. They also completed a functional MRI session, during which they viewed 60 positive, 60 negative, and 60 neutral images taken from the International Affective Picture System database, providing a measure of neural reactivity to affective information. Region-of-interest analyses revealed that higher inflammation was associated with lower activity in the amygdala and ventral striatum when viewing positive (vs. neutral) images. Specifically, a composite measure of IL-6 and CRP was negatively associated with activity in both the amygdala and the ventral striatum to positive images. These results are robust to the inclusion of key covariates (i.e., age, gender, SES, body mass index). Behavioral findings corroborate these neural findings: Participants with higher levels of inflammation were less accurate in labeling positive images as positive, relative to those with lower levels of inflammation. In contrast, IL-6 and CRP were not associated with neural activity in regions-of-interest in response to the negative images. These results suggest that systemic, low-grade inflammation is associated with lower levels of activity in affect-related brain regions in response to positive stimuli, which may have implications for the pathophysiology of physical and mental illness, particularly those characterized by anhedonia.

Individual Abstract Number: 1319

Socioeconomic status, dorsolateral prefrontal cortical volume, and insulin resistance during early adolescence

Jessica J. Chiang, PhD, Department of Psychology, Georgetown University, Washington, DC, Robin Nusslock Nusslock, PhD, Institute for Policy Research; Department of Psychology, Casey C. Armstrong, MS, Ann L. Carroll, MS, Department of Psychology, Lisanne M. Jenkins, PhD, Lei Wang, PhD, Department of Psychiatry and Behavioral Sciences, Gregory E. Miller, PhD, Institute for Policy Research; Department of Psychology, Northwestern University, Evanston, IL

Insulin resistance (IR) elevates risk for CVD and is strongly associated with other CVD risk factors (i.e., obesity, metabolic syndrome, diabetes). Notably, IR and its associated diseases are patterned by early life socioeconomic status (SES), with low early SES predicting greater risk. Theoretical work suggests that alterations in neural development, particularly in prefrontal cortex (PFC) regions subserving executive control and emotion processing, may be important pathways linking low early SES to greater IR and disease risk; however, few studies have

empirically tested this notion. Thus, the current study examined how SES is associated with IR in a sample of youth, and whether this link was explained by volume differences in the dorsolateral PFC (DLPFC), ventrolateral PFC (VLPFC), and the orbitofrontal cortex (OFC), regions implicated in executive control and emotion processes. Participants were 254 8th graders from the greater Chicago area. Youth's parents reported on the highest level of education completed by each parent and on their previous year's total household income and family savings. Parent education was averaged across parents, and income and savings were averaged to index overall financial resources. Insulin and glucose were assessed from fasting blood samples and used to compute HOMA-IR. Structural imaging data were acquired with a Siemens Prisma 3 Tesla scanner, and the *recon-all* pipeline from FreeSurfer was used to preprocess scans and extract measures of DLPFC, VLPFC, and OFC volume. Lower parent education (but not financial resources) was associated with higher IR ($b(SE) = -.38(.14), p = .007$), and with smaller DLPFC ($b(SE) = .53(.21), p = .013$) and lateral OFC volumes ($b(SE) = .24(.09), p = .006$). In turn, smaller DLPFC (but not lateral OFC) volume was linked to higher IR ($b(SE) = -.33(.14), p = .020$). The indirect path from lower parent education to greater IR through smaller DLPFC volume was significant (indirect effect: $-.05, SE = .03, 95\% CI = [-.12, -.003]$). Follow-up analyses examined the role of BMI and showed that parent education was associated with IR sequentially through smaller DLPFC volume and higher BMI (indirect effect: $-.03, SE = .02, 95\% CI = [-.07, -.001]$). Findings support the notion that structural alterations in particular regions of the PFC may be an important pathway linking early SES to greater risk for IR.

Symposium 1090

Providing quality pain care to United States Military Veterans: Reaching the marginalized and under-served

Friday, March 13 from 4:15 to 5:30 pm

PROVIDING QUALITY PAIN CARE TO UNITED STATES MILITARY VETERANS: REACHING THE MARGINALIZED AND UNDER-SERVED

Katie Hadlandsmayth, PhD, Anesthesia, University of Iowa, Carver College of Medicine, Iowa City, IA, Mary Driscoll, PhD, Psychiatry, Yale School of Medicine, West Haven, CT, Diana J. Burgess, PhD, Department of Medicine, University of Minnesota and Minneapolis VAHCS, Minneapolis, MN, Katie Hadlandsmayth, PhD, Department of Anesthesia, Carver College of Medicine, University of Iowa, Iowa City, IA, Joseph L. Goulet, PhD, Emergency Medicine, Yale School of Medicine, West Haven, CT

Chronic pain is more prevalent among United States Veterans compared to the general population. As in the non-Veteran population, disparities in pain and pain management exist for Veterans from marginalized and underserved groups (e.g., women, racial and ethnic minorities, gender and sexual minorities, and rural Veterans). These subgroups of Veterans may be more likely to experience stressors, such as prejudice and discrimination, that contribute to chronic pain, and experience barriers to optimal chronic pain care (e.g., access, discrimination, and comorbid conditions). VA enrolled Women Veterans have higher rates of chronic pain and while they utilize more pain care resources, they are less satisfied with the care they receive, feel stigmatized, and experience barriers and unique social stressors that can interfere with pain management. African American patients with chronic pain, including Veterans, are more likely to be undertreated by healthcare providers compared to Whites; among African American Veterans experiences of racial discrimination are associated with greater pain. Rural-dwelling Veterans may experience challenges with access to chronic pain care and receive more opioid prescriptions. Despite a small but growing literature on lesbian, gay, bisexual, transgender, or queer (LGBTQ) healthcare, little research has

examined the healthcare of LGBTQ Veterans. This is in part, but not exclusively, due to the VA not yet collecting sexual orientation or gender identity data in a structured manner. Broadly, LGBTQ veterans experience high rates of trauma, discrimination, and minority stress in the military and healthcare, which leads to lower utilization of care. An innovative peer-support pain self-management intervention for Women Veterans will be presented. Perspectives of Women and African American Veterans with chronic pain will be presented as well as the responsive interventions that were designed specifically for each of these groups: one mindfulness-focused and one walking-based intervention. An accessible psychological intervention designed for rural Veterans during the perioperative period will also be presented. Finally, a conceptual model of minority stress among LGBTQ Veterans will be presented in conjunction with administrative data demonstrating the detrimental impacts of these processes, with a specific focus on suicide and self-injury.

Individual Abstract Number: 1229

Pain Self-Management for Women Veterans with Chronic Pain: The Project CONNECT Pilot

Mary Driscoll, PhD, Psychiatry, Yale School of Medicine, West Haven, CT, Alicia A. Heapy, PhD, Robert Kerns, PhD, Psychiatry, Sally Haskell, MD, Internal Medicine, Yale School of Medicine, New Haven, CT

Women represent the fastest growing segment of VA utilizers and over 70% report chronic pain. Relative to men with chronic pain, women report more physical disability and emotional distress. The promotion of patient pain self-management has emerged as a national priority, both within and outside of VA both as a means to improve clinical outcomes and to reduce reliance on risky interventions and medications. Cognitive behavioral therapy for chronic pain (CBT-CP) is the gold standard in pain self-management, yet *several clinical and research gaps* reveal a confluence of barriers that limit uptake, particularly among women Veterans. Indeed, women Veterans frequently cite competing demands, the need for gender-sensitive care, and low levels of social support as barriers. Patient-centered efforts to address these *logistical, healthcare delivery and psychosocial* barriers may translate to improved treatment access, engagement, adherence with recommendations, and more optimal outcomes for women Veterans. This presentation will systematically showcase the progression of efforts a) to identify the unique needs of women Veterans with chronic pain and the barriers to accessing CBT-CP that they encounter, and b) to develop a new intervention (CONNECT) by tailoring and augmenting existing evidence-based interventions to address the identified needs and barriers. CONNECT is a home-based reciprocal peer support intervention that leverages the use of text/phone-based interactions, and the provision of social support to engage women Veterans in a pain self-management program. Findings from the CONNECT pilot trial which examine feasibility, acceptability and safety will also be presented. Results suggest that women were generally satisfied with the intervention, but several challenges emerged as important targets for further refinement. These will be discussed in light of further efforts to tailor the intervention.

Individual Abstract Number: 1230**Tailoring behavioral interventions for African American and Women Veterans with pain**

Diana J. Burgess, PhD, Department of Medicine, University of Minnesota and Minneapolis VAHCS, Minneapolis, MN

I will discuss two behavioral interventions to improve chronic pain outcomes among Veterans, designed to address the needs and preferences of women and African Americans, two groups that experience disparities in pain treatment and outcomes. Both interventions adapt evidence-based non-pharmacological treatment approaches to chronic pain, to address contributors to racial and gender disparities and barriers to access and engagement. The ACTION intervention is a proactively-delivered, phone-based, pedometer-mediated counseling intervention, designed to increase walking and improve pain outcomes. Two components of ACTION--motivational interviewing by a supportive coach, and action planning (training participants in a specific type of "if-then" planning)--address psychological, healthcare-related and environmental barriers to physical activity that African Americans are more likely to experience (e.g., lower exercise self-efficacy, poorer communication with their healthcare provider, less walkable neighborhoods). We also refined ACTION based on iterative feedback from focus groups of African American Veterans with chronic pain. The LAMP (Learning to Apply Mindfulness to Pain) intervention adapts Mindfulness-Based Stress Reduction (MBSR) to meet the needs of women Veterans. For instance, because the group format can pose a barrier for female Veterans, many of whom have experienced military sexual trauma, we are testing a "mobile mindfulness" version of LAMP without the group component. In our pilot work, we are also exploring whether we should create female-only mindfulness groups and whether we should offer mindfulness groups outside Veterans Affairs (VA) facilities, as female Veterans have reported sexual harassment and/or discomfort with VA. We also recorded meditations with both male and female voices. I will also discuss how ACTION and LAMP were developed to be suitable to all Veterans, many of whom are members of marginalized groups that experience disparities, and discuss strategies we used to design and modify our interventions. Strategies include convening an ongoing panel of Veteran partners to provide input throughout the study, obtaining iterative feedback through focus groups and interviews, drawing from experiences of researchers, providers, and other stakeholders, and conducting post-intervention interviews with interventionists and participants.

Individual Abstract Number: 1231**An Accessible Psychological Intervention to Promote Post-Surgical Pain Self-Management among Rural Veterans**

Katie Hadlandsmayh, PhD, Department of Anesthesia, Carver College of Medicine, Mandy Conrad, BA, Ashlie Obrecht, MA, College of Education, University of Iowa, Iowa City, IA, Kenda Steffensmeier, PhD, Jennifer Van Tiem, PhD, CADRE, Iowa City VA, Iowa City, IA, Mark Vander Weg, PhD, Internal Medicine, University of Iowa, Iowa City, IA

Rural-dwelling individuals in the United States, including Veterans, receive poorer quality chronic pain care and take disproportionately larger amounts of opioid medications compared to urban residents. This likely reflects, at least in part, limited access to non-pharmacological treatment options for pain. Accessible pain self-management programs are needed to best serve rural communities. We piloted a randomized psychological intervention teaching pain self-management skills prior to and following surgery, with rural-dwelling Veterans undergoing a range of surgeries that pose a risk for chronic post-surgical pain. The Perioperative Pain Self-management (PePS) program designed for this study is based on principles of cognitive behavioral therapy for chronic pain, modified for the surgical process and delivered over the telephone. PePS is a four-session protocol. A total of 46 rural participants completed the study, 21 randomized to PePS and 25 randomized to standard care (SC). Intervention retention was very good with 91% of participants who started treatment completing it. Satisfaction with treatment was excellent with 100% of

those who completed the study reporting that they were "Satisfied" (56%) to "Very Satisfied" (44%) with the intervention. Among participants randomized to the PePS arm, qualitative analyses indicated preference for the telephone format for the pre- and post-surgical sessions. Qualitative analyses also revealed that patients expressed that the PePS program helped them think differently about pain, positively impacted their experience of pain and surgery, helped them take their mind off pain, improved pain coping skills, helped them gain perspective on what is important in life, and reduced their reliance on medications. Preliminary quantitative results demonstrated that despite equivalent levels of moderate to severe pain preoperatively, only 14% of those receiving the PePS program, compared to 24% of those receiving SC reported moderate-severe surgical site pain (Odds ratio = 1.90; 95% CI: 0.41 – 8.74). In addition, 16% of those receiving SC were taking opioids at 3 months post-surgery compared to 9.5% of the PePS group (Odds ratio = 1.81; 95% CI: 0.30 – 11.03). These findings suggest preliminary efficacy and feasibility of the PePS intervention; a larger trial is needed to confirm these preliminary findings.

Individual Abstract Number: 1232**Understanding Suicide Risks among LGBT Veterans in VA Care**

Joseph L. Goulet, PhD, Emergency Medicine, Yale School of Medicine, West Haven, CT

The US military's prohibition of lesbian, gay, and bisexual (LGB) personnel was modified in 1994 under a policy known as "Don't Ask, Don't Tell" (DADT). DADT was repealed in 2010, yet discharge is still possible. LGB personnel are *currently* able to openly serve, while the status of transgender (T) personnel remains uncertain due to a 2017 Presidential memo. Fear of expulsion, discrimination, and stigma likely colors many LGBT Veterans' military experiences.

In 2012, the VA's Office of Patient Care Services created the LGBT Health Program, which provides policy recommendations, provider-education, and clinical services to support personalized, patient-driven healthcare for LGBT Veterans. VA recognizes the challenges LGBT Veterans may face, including higher rates of: substance abuse; discrimination, stigma, and trauma; mental health conditions; and suicide. Many of these factors are associated with co-occurring pain.

Pain is the most common symptom in healthcare, accounting for up to 40% of primary care visits. People with chronic non-cancer pain have double the risk of suicide and are 2-3x more likely to experience suicidal ideation or make attempts. In one study of Veterans in VA care, severe pain was associated with higher risk of suicide (HR 1.33; 95%CI 1.15/1.54). While there is concern that under-treatment increases suicide risk, there is evidence linking opioid use with risk, and on opioid cessation increasing risk.

Nearly one in six LGBT people report avoiding medical care, even when needed, over fears of discrimination. Despite known health differences among LGBT Americans, the VA does not collect structured data on sexual orientation or gender identity (SO/GI) from the 10 million Veterans in care. Therefore, we are creating a cohort using VA EHR data that employs informatics tools to identify LGBT Veterans in unstructured notes and structured data (e.g. ICD codes; if a transgender Veteran wishes to use VA services for hormone therapy, s/he needs a diagnosis of 'gender dysphoria' (F64)). We will validate LGBT status using existing survey data on self-reported SO/GI. We aim to identify pathways to suicidal behavior in gender, age, and racial and ethnic groups, with a focus on pain and pain treatments. The goal is to expand our understanding of areas of unmet need and outreach to all individuals at risk for suicide.

Symposium 1095

When do psychological resources mitigate social disparities in health, and for whom?

Friday, March 13 from 2:45 to 4:00 pm

WHEN DO PSYCHOLOGICAL RESOURCES MITIGATE SOCIAL DISPARITIES IN HEALTH, AND FOR WHOM?

Lewina O. Lee, Ph.D., Department of Psychiatry, Boston University School of Medicine, Boston, MA, Harold H. Lee, PhD, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Sakurako S. Okuzono, MPH, Department of Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA, Kristen M. Nishimi, MPH, Social and Behavioral Sciences, Harvard TH Chan School of Public Health, Boston, MA, Lewina O. Lee, Ph.D., Department of Psychiatry, Boston University School of Medicine, Boston, MA, Laura D. Kubzansky, Ph.D., Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Mounting research has suggested psychological resources, such as optimism and psychological well-being, may causally contribute to attaining and maintaining favorable health and reducing risk of chronic diseases and mortality. While psychological resources are patterned by socio-structural factors, we know little about whether associations of psychological resources to health may differ by socio-structural factors, if mechanisms underlying these associations are identical across diverse populations, and if various psychological resources are experienced similarly across cultures. This symposium presents 4 studies which tackle these questions from different angles using data from 3 diverse epidemiologic cohorts. Authors of the first talk will present novel data from 4,694 African Americans collected over 17 years in the Jackson Heart Study. They will report on the prospective association of optimism to mortality, and evaluate income and occupation as effect modifiers. The second talk further examines the optimism-mortality association in a population-based cohort of >8000 Japanese older adults. The authors will discuss the related constructs of optimism and *ikigai* (a sense of life worth living) and their differential associations with lifespan over 7 years. Next, in a pair of studies drawing on the nationally representative Midlife in the United States (MIDUS) study, we consider childhood psychosocial adversity as an early-life exposure which sets the stage for lifespan health disparities. The third talk will present new findings on whether adulthood psychological health buffers the negative influence of childhood psychosocial adversity on incident cardiometabolic disease in later life. The fourth talk focuses on adult acute cardiovascular stress response as an outcome, given its potential role as an early risk indicator of subsequent cardiovascular disease. Drawing from MIDUS data, the speaker will report on the relation between childhood psychosocial adversity and changes in heart rate variability in response to mental stressors, and the role of psychological resources, such as optimism, as effect modifiers. The Discussant will synthesize these findings to address the questions: For whom are psychological resources health-protective, and can they buffer the adverse effects of social disadvantage across cultures and developmental stages?

Individual Abstract Number: 1569

Optimism and mortality among African Americans: The Jackson Heart Study

Harold H. Lee, PhD, Sakurako S. Okuzono, MPH, Eric S. Kim, PhD, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, LáShauntá M. Glover, MS, Department of Epidemiology, University of North Carolina at Chapel Hill, Chapel Hill, NC, Mario Sims, PhD, Department of Medicine, University of Mississippi Medical Center, Jackson, MS, Francine Grodstein, PhD, Channing Division of Network Medicine, Brigham and Women's Hospital, Boston, Boston, MA, Laura D. Kubzansky, PhD, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Background: Optimism is associated with reduced mortality among Whites, but evidence for this relationship is limited among African Americans (AAs), whose life expectancy is shorter than Whites. We investigated the association of optimism with mortality risk among AAs.

Methods: We examined 4694 AAs from the Jackson Heart Study followed from 2001 to 2018. Optimism, measured in 2000-2004 using the Life Orientation Test-revised (range 6-24), was negatively skewed, and thus was examined as a binary variable: higher (score >19=1st quartile) vs. lower optimism. We obtained hazard ratios (HRs) using Cox proportional hazards models and adjusted for relevant covariates. In the first model, we adjusted for primary confounders (i.e., age, marital status, income, education, and occupation), and in a subsequent model we adjusted for depressive symptoms, health conditions (i.e., physical exam in the past year, high cholesterol, hypertension, diabetes, history of: cancer or cardiovascular disease), and health behaviors (i.e., physical activity, diet quality, smoking, and body mass index).

Results: At baseline, participants had a mean age of 54.5 years, and 65% were women. After a median follow-up of 14.6 years, 886 deaths occurred. Adjusting for primary confounders, higher versus lower optimism was associated with 14% lower mortality risk (HR= 0.86; 95% CI= 0.75-0.99); after full adjustment, associations were attenuated and no longer significant (HR=0.90; 95% CI=0.78-1.04). However, we observed strong relations of higher (vs. lower) optimism with higher income and occupation; thus, we examined potential effect modification by these factors. In fully adjusted models, higher optimism was associated with reduced mortality risk among those with higher (e.g., >\$20,000 for single; >\$25,000 for 2-3 person family; >\$35,000 for 4 person family in 2004) but not lower income (p value for interaction=0.003); similar findings were observed among professionals vs. non-professionals/unemployed (p value for interaction=0.002). Higher versus lower optimism was associated with 27% lower mortality risk (HR=0.73; 95% CI=0.58-0.92) in the higher income group and 34% lower risk (HR=0.66; 95% CI=0.49-0.87) among professionals.

Conclusions: Higher optimism was associated with reduced mortality only among AAs with higher income or professional occupations.

Individual Abstract Number: 1474

optimism, *ikigai*, and lifespan among Japanese older adults

Sakurako S. Okuzono, MPH, Harold H. Lee, PhD, Department of Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA, Kokoro Shirai, PhD, Department of Public Health, Osaka University, Osaka, NA, Japan, Naoki Kondo, PhD, Department of Health and Social Behavior, The University of Tokyo, Tokyo, NA, Japan, Ichiro Kawachi, PhD, Department of Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA, Laura D. Kubzansky, PhD, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Background: Prior research suggests positive psychological well-being (PPWB) buffers against age-related disease or mortality. However, most evidence is from western populations (e.g., U.S., Netherlands); few studies have examined if health-protective effects of PPWB generalize to other cultures and populations. Given some Asian populations, like Japanese, have longer lifespan but also lower PPWB, this question is of particular interest. Several studies have evaluated mortality risk in relation to 'ikigai,' a sense of life worth living, in Japanese samples, but only a few have examined optimism. We evaluated 2 facets of PPWB, optimism and *ikigai*, in relation to longer lifespan in Japanese adults.

Methods: We used a population-based cohort data of adults aged ≥65 from the Japan Gerontological Evaluation Study (JAGES) (analytic sample for optimism: N=10,473, for *ikigai*: N=8,377). Data were collected by questionnaire every 3 years. Optimism was measured in 2010 using the Life Orientation Test-Revised. *Ikigai* was assessed in 2013 by a single item asking if participants have *ikigai* (yes/no

response). Lifespan was assessed using national mortality records from 2010 to 2017. Using accelerated failure time models, we examined optimism/ikigai in relation to longer lifespan, adjusting for relevant covariates including sociodemographic characteristics, health status, depression, and health behaviors.

Results: The analytic sample for optimism was comprised of 44% women and mean age of 73, and for ikigai was comprised of 46% women and mean age of 75. In age-adjusted models, optimism (continuous) was not significantly associated with longer lifespan (1.6%, 95%CI: -0.67, 3.84), whereas ikigai was significantly associated (12.7%, 95%CI: 5.34, 20.56). Associations were similar in fully adjusted models (optimism: 0.1%, 95%CI: -2.09, 2.32, ikigai: 9.4%, 95%CI: 2.12, 17.25).

Conclusion: Optimism was not associated with longer lifespan, whereas ikigai was associated with longer lifespan among Japanese older adults. This finding was consistent with previous studies of ikigai in Japan, but not consistent with prior work on optimism in western samples. In this sample, optimism had limited variability which may suggest it is not a meaningful aspect of PPWB in this culture. Future studies on PPWB in relation to health should consider if linkages differ depending on cultural context.

Individual Abstract Number: 1247

Psychological resilience from early adversity predicting cardiometabolic disease outcomes in adulthood in the MIDUS study

Kristen M. Nishimi, MPH, Social and Behavioral Sciences, Karestan C. Koenen, PhD, Epidemiology, Brent Coull, PhD, Biostatistics, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard TH Chan School of Public Health, Boston, MA

Background: Early adversity exposure is associated with multiple negative health-related outcomes, including cardiometabolic disease (CMD). Specifically, childhood adversity exposure is consistently implicated in psychological distress in adolescence and into adulthood, and psychological distress has been strongly linked to CMD. However, not everyone exposed to adversity experiences negative psychological sequelae. Psychological resilience, or positive psychological health in individuals exposed to early adversity, may protect against CMD risk in adulthood.

Methods: Data are from the Midlife in the United States Study, a longitudinal cohort of adults (N=1,208) assessed at 3 waves. Psychological resilience was defined at Wave 2 (mean age 58.6) using validated self-report questionnaires based on 1) psychosocial adversity exposure before age 18 and 2) psychological health in adulthood (comprised of low psychological distress, including depressive and anxiety symptoms, and high psychological well-being). We operationalized psychological resilience categorically and continuously. Categorical resilience was based on cross-classifying adversity (exposed vs unexposed) and psychological health (higher vs lower). Continuous resilience was based on count of adversity exposures and psychological symptoms as separate variables. Incident CMD at Wave 3 was assessed by self-report of doctor diagnosis of heart attack, heart failure, coronary artery disease, stroke, or diabetes. Regression models evaluated associations of psychological resilience with any CMD, adjusting for multiple covariates.

Results: There were 164 (13.6%) cases of incident CMD in the sample. Early adversity exposure and adult psychological health independently predicted incident CMD; when co-adjusting for adversity and psychological health and covariates, one standard deviation increase in adversity count was associated with 1.20 higher odds of CMD (aOR=1.23, 95%CI 1.09, 1.39) and one standard deviation increase in psychological health was associated with 0.92 times lower odds of CMD (aOR=0.92, 95%CI 0.85, 1.00). There was no evidence of an adversity-psychological health interaction, perhaps because few individuals with high adversity had high psychological health.

Conclusions: Early life adversity and psychological health in midlife each impact cardiometabolic disease processes into adulthood.

Individual Abstract Number: 1815

Childhood emotional abuse and adulthood cardiovascular acute stress response:

Do psychological resources make a difference?

Lewina O. Lee, Ph.D., Department of Psychiatry, Boston University School of Medicine, Boston, MA, Laura D. Kubzansky, Ph.D., Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

INTRODUCTION: Abnormal physiologic response to acute stressors have been proposed as an early indicator of the harmful effects of psychosocial stress exposure on the development of chronic diseases. However, few studies have examined whether early adversity may influence how cardiac vagal tone fluctuate in response to acute stressors. While psychological resources, such as optimism, are generally health-protective, their role in the relation between early adversity and acute physiologic stress response is largely understudied. This study evaluated the association of childhood emotional abuse to adult heart rate variability (HRV) response to a lab-based stressor, and the role of optimism in the association.

METHODS: The sample comprised 1054 participants from Wave II of the Midlife in the United States Study (MIDUS) (55% female, M_{age}=58, SD=12). Childhood emotional abuse was assessed retrospectively using the Childhood Trauma Questionnaire. As part of a lab experiment within the Biomarker Study, high-frequency HRV (HF-HRV) was measured during a baseline resting period, a lab-based cognitive stressor, and a subsequent recovery period. HRV stress reactivity was the residualized change in HF-HRV from baseline to the cognitive stressor, and HRV stress response was the residualized change in HF-HRV from baseline to the recovery period. Optimism was assessed using the Life Orientation Test-Revised.

RESULTS: Higher levels of early emotional abuse were associated with lower baseline levels of HF-HRV. After adjusting for baseline HF-HRV and optimism, higher levels of early emotional abuse was associated with lower HF-HRV reactivity to acute stressor. Optimism was not associated with HF-HRV acute stress reactivity, and did not modify the association between early emotional abuse and HF-HRV reactivity. HF-HRV recovery was neither associated with early emotional abuse nor optimism. Optimism also did not modify the association of early emotional abuse with HF-HRV acute stress recovery. All models adjusted for sex, age, race, education, health conditions, smoking, body-mass index, and physical activity.

CONCLUSION: Findings are consistent with early adversity being an antecedent of blunted acute stress reactivity. Psychological resources such as optimism, however, did not appear to mitigate the influence of early adversity on physiologic acute stress response.

Symposium 1103

High quality romantic relationships and good health: An in-depth look at physiological pathways

Saturday, March 14 from 3:15 to 4:30 pm

HIGH QUALITY ROMANTIC RELATIONSHIPS AND GOOD HEALTH: AN IN-DEPTH LOOK AT PHYSIOLOGICAL PATHWAYS

Sohyun C. Han, MA, Psychology, University of Southern California, Los Angeles, CA, Sohyun C. Han, MA, Psychology, University of Southern California, Los Angeles, CA, Geoffrey Corner, MA, Psychology, University of Southern California, Los Angeles, CA, Yehsong Kim, MA, Psychology, University of Southern California, Los Angeles, CA, Kelly F. Kazmierski, PhD, Department of Psychiatry and Human Behavior, University of California, Irvine, Irvine, CA, Darby Saxbe, PhD, Psychology, University of Southern California, Los Angeles, CA

Romantic relationships are important for health and well-being. Being married or having a high-quality relationship are associated with reduced morbidity and mortality, yet little is known about the physiological pathways underlying these links. This symposium seeks

to highlight a broad range of physiological processes ranging from sleep to inflammation that may help explain how romantic relationships promote health.

The first paper examines how the simple presence of a romantic partner is associated with reduced physiological stress reactivity among couples as they go about their daily lives. Romantic attachment style moderates this relationship, suggesting that expectations of relationships may impact the extent to which partner presence is physiologically regulating. The second paper takes an in-depth look at romantic partner interactions during in-lab loss discussions that are associated with changes in physiology. Namely, this study explores how a romantic partner's use of meaning making is associated with lower physiological arousal in the other partner as they discuss a significant loss. The next two studies examine how romantic relationships may help protect against the detrimental health effects stemming from adversity, including discrimination and adverse childhood experiences. The third study investigates the link between discrimination and poor sleep quality and identifies how qualities of the romantic relationship may buffer or amplify this association. Lastly, the fourth study explores how romantic relationships may buffer against the harmful effects of family-of-origin aggression. Specifically, this study examines how secure romantic attachment attenuates the effect of family-of-origin aggression on inflammation via cortisol reactivity. Using relevant expertise on close relationships and psychophysiology, the discussant will integrate findings within the larger context of biopsychosocial processes in romantic relationships. The discussant will comment on future directions in research that will further expound the link between romantic relationships and good health.

Individual Abstract Number: 1278

Romantic Partner Presence and Physiological Regulation in Daily Life

Sohyun C. Han, MA, Psychology, University of Southern California, Los Angeles, CA, Hannah L. Schacter, PhD, Psychology, Wayne State University, Detroit, MI, Adela C. Timmons, PhD, Center for Children and Families, Florida International University, Miami, FL, Gayla Margolin, PhD, Psychology, University of Southern California, Los Angeles, CA

Little is known about the physiological pathways that underlie the link between romantic relationships and better health. Social baseline theory posits that the proximity of close others is a potential explanatory factor. Building on in-lab studies, we test this theory in daily life and hypothesize that the presence of a romantic partner is associated with reduced sympathetic nervous system activity as measured via electrodermal activity (EDA). We further test whether attachment style moderates this link.

The sample includes 106 young adult dating couples (M Age = 22.7; SD = 2.5) who had been dating for an average of 2.5 years. Each participant wore a wireless wrist monitor that continuously collected EDA for 24 hours. The next day, couples reported whether they were together or apart and what activity they did each hour. Participants additionally completed the Experiences in Close Relationships questionnaire, a measure of attachment style. Multilevel models were used to test hourly partner presence as a predictor of men's and women's EDA, accounting for within-person covariates (physical activity, sleep, interacting with others, consumption of alcohol, tobacco, and drugs) and between-person covariates (age, race/ethnicity, relationship length, cohabitation). Results indicated that both men's and women's EDA significantly decreased during hours they were with their partner relative to hours when they were apart. Men's anxious attachment significantly moderated the link between partner presence and men's EDA ($b = -.24, p < .001$), such that the link was stronger among those with high anxious attachment. Similarly, men's avoidant attachment style significantly moderated the link between partner presence and men's EDA ($b = .23, p < .001$) such that the link was weaker among those with high avoidant attachment. No significant moderation effects emerged for women.

Our findings suggest that the presence of a romantic partner may be physiologically regulating in daily life. However, these effects depend on individual attachment style, as those with high anxious or avoidant attachment style may perceive partner presence to be more or less regulating based on their expectations of relationships.

Individual Abstract Number: 1279

The Physiology of Dyadic Meaning-Making in Couples' Discussions About Loss

Geoffrey Corner, MA, Hannah Rasmussen, MA, Psychology, University of Southern California, Los Angeles, CA, Corey Pettit, BA, Psychology, University of Virginia, Charlottesville, VA, Reout Arbel, PhD, Counseling and Human Development, University of Haifa, Haifa, NA, Israel, Marie-Eve Daspe, PhD, Psychology, Université de Montréal, Montreal, NA, Canada, Darby Saxbe, PhD, Gayla Margolin, PhD, Psychology, University of Southern California, Los Angeles, CA

Meaning making (MM) is a valuable process in adjusting to the experience of a loss and refers to establishing a post-loss sense of meaning or identity. It can unfold in the family context, and a romantic partner may be a valuable source of support in this process. Research suggests that reckoning with meaninglessness elicits physiological arousal, including a heightened skin conductance response (SCR). MM that occurs dyadically may also be associated with changes in physiology. The current study investigated the physiology of MM in partners' discussions about loss.

Opposite-sex couples ($n=111$) participated in a series of in-lab discussions while their physiology was monitored. In one of these discussions, participants shared an emotionally significant loss with their partner (the "listener"), with each participant taking a turn sharing a loss (the "narrator"). Discussions were video-recorded and coded for minute-to-minute MM. Physiological arousal was assessed as the number of skin conductance responses (SCRs) that occurred in each minute, which were synchronized with MM data. Multilevel models for intensive longitudinal data from distinguishable dyads were used to test associations between MM and SCRs, accounting for the interdependency of repeated observations and correlations between partners' data.

When the listener engaged in more MM in a given minute, the narrator demonstrated fewer SCRs ($B=-0.44, p=.004$). In other words, participants sharing a loss experienced lower levels of physiological arousal when their partner was engaging in MM. Neither the narrator's own MM in a given minute nor overall levels of MM in either partner were associated with SCRs in the narrator. Listeners engaged in coded MM in 37% of minutes, and 84% of listeners engaged in MM at some point in the discussion, suggesting that MM was a relatively common phenomenon.

One interpretation of these results is that individuals may be able to support their partner in the process of MM, alleviating some of the physiological arousal their partner experiences in sharing a loss. Alternatively, it could be easier to engage in MM when one's partner is experiencing lower level of physiological arousal. Either way, these findings highlight the value of dyadic processes in MM in the context of emotionally significant loss. Strengths, limitations, and directions for future research will be discussed.

Individual Abstract Number: 1110

Links Between Discrimination and Sleep Quality Examined Within a Romantic Relationship Context

Yehsong Kim, MA, Psychology, University of Southern California, Los Angeles, CA, Stassja Sichko, BA, Psychology, University of California, Los Angeles, Los Angeles, CA, Gayla Margolin, PhD, Psychology, University of Southern California, Los Angeles, CA

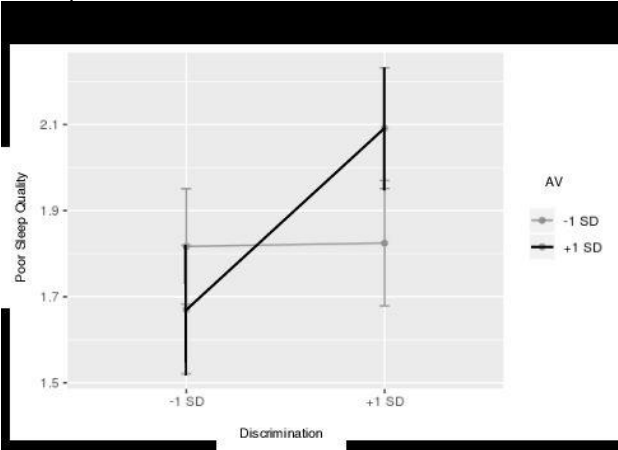
Discrimination is associated with worse sleep, including self-reported sleep quality, poor sleep efficiency (Owens, Hunte, Sterkel, Johnson, & Johnson-Lawrence, 2017), shorter sleep duration, and a smaller proportion of REM sleep (Beatty et al., 2011). However, no studies have examined the effects of relationship qualities on the link between discrimination and sleep. Attachment insecurity predicts different

physiological patterns in response to stress (Pietromonaco, DeBuse, & Powers, 2013), suggesting that the effect of an external stressor (i.e., discrimination) may affect health (i.e., sleep) differentially in securely compared to insecurely attached individuals. The present study is the first to examine the moderating effects of attachment style on the association between discrimination and sleep in dating couples. We hypothesize that high anxious (AX) or avoidant (AV) attachment will exacerbate the effects of discrimination on sleep quality.

74 young adult dating couples ($M_{age} = 22.9$ years, $SD_{age} = 2.5$; 14% Asian, 14% Black, 25% Latinx, 15% Multi-racial, 32% White) reported on experiencing negative judgments or unfair treatment on a 27-item perceived discrimination survey. One year later, participants completed the 26-item attachment style measure, Revised Experiences in Close Relationships (ECR-R; Fraley, Waller, & Brennan, 2000), and a 14-item survey on poor sleep quality.

Multilevel analyses assessed moderating effects of AX and AV on the association between discrimination and poor sleep quality. Covariates included gender, relationship length, and couple cohabitation. AV moderated the association between discrimination and poor sleep quality ($b = 0.47, p < .01$). There was a positive relationship between discrimination and poor sleep quality for those who reported high AV ($b = 0.82, p < .001$), but not low AV ($b = 0.02, ns$). AX did not moderate the association between discrimination and sleep. Direct effects were found between AX and poor sleep quality ($b = 0.12, p < .01$). No direct effects were observed between AV ($b = -0.03, ns$) or discrimination ($b = 0.26, ns$) and poor sleep.

Results suggest that high AV strengthens the link between discrimination and poor sleep quality, or alternatively, that secure attachment weakens the link. Future studies could examine other relationship factors that may alter potential impacts of discrimination on sleep.



Individual Abstract Number: 1277
Family-of-origin aggression and inflammation in young adulthood: Romantic relationships as buffers of risky health trajectories

Kelly F. Kazmierski, PhD, Department of Psychiatry and Human Behavior, University of California, Irvine, Irvine, CA, Corey Pettit, BA, Psychology, University of Virginia, Charlottesville, VA, Stassja Sichko, BA, Psychology, University of California, Los Angeles, Los Angeles, CA, Gayla Margolin, PhD, Psychology, University of Southern California, Los Angeles, CA

Growing up in an aggressive family lifelong confers health risk (e.g., Moffitt, 2013). However, less is known about how the romantic relationships young adults form may interrupt trajectories from family of origin aggression (FOA) to disease. Using inflammation as an early health marker, the present study assesses whether health effects of FOA can be detected in a community sample of young adults, whether hypothalamic-pituitary-adrenal (HPA) axis activity during interactions with romantic partners mediates these associations, and whether this risk mechanism is reduced for young adults with more secure (less avoidant) romantic attachment.

Eighty-five opposite sex couples (ages 18-25, $M = 23$; $M = 31$ months dating; 43% cohabiting) reported on FOA (modified from Straus et al., 1998) and attachment avoidance (Experiences in Close Relationships-Revised; Fraley et al., 2000), engaged in interaction tasks and provided saliva samples to measure HPA activity (indexed by cortisol slope), and had at least one partner complete a follow-up health visit ($M = 18$ months later). Interactions included discussions of desired relationship change and experiences of personal loss. At follow up, inflammation was indexed by two pro-inflammatory cytokines: interleukin-1 β (IL-1 β) and interleukin-6 (IL-6), using dried blood spots. Hypotheses were tested in multi-level structural equation models.

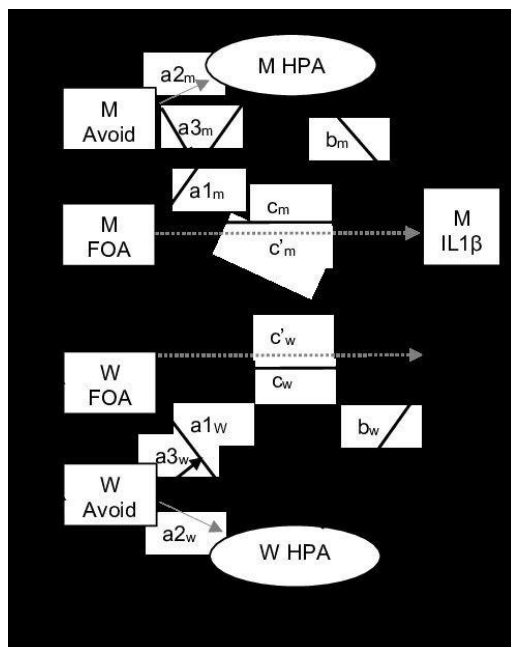
For men, FOA predicted greater IL-1 β ($b = 0.025, SD = 0.013, CI = 0.002, 0.049$) and IL-6 ($b = 0.006, SD = 0.003, CI = 0.001, 0.011$). The indirect effect of men's FOA on IL-1 β through HPA activity was conditioned on men's attachment avoidance ($b = 0.019, SD = 0.012, CI = 0.002, 0.045$), such that greater FOA only predicted HPA for more avoidant men; HPA, in turn, predicted greater IL-1 β . Low avoidance buffered men from the total effect of FOA on IL-1 β . No conditional indirect effects were detected for men's IL-6. FOA did not predict women's inflammation.

By identifying how romantic attachment attenuates risky health trajectories, we take an exploratory step toward discerning how young adults' relationships may serve as natural points of intervention. Low-avoidant young men display health-protective patterns of HPA reactivity after FOA exposure, which may not only prevent further bodily wear and tear but also create an environment that promotes recovery from FOA-induced chronic inflammation.

Table 1.
Bayesian multi-level structural equation models
testing conditional indirect effects of men's
family of origin aggression on men's IL1 β ,
through hypothalamic-pituitary-adrenal
reactivity (indexed by cortisol slope) at high and
low levels of attachment avoidance.

	Est (LLCI, ULCI)
Step 1: Effects of FOA on inflammation	
FOA (path c)	0.025* (0.002, 0.049)
Step 2: Effects of FOA on HPA¹	
FOA (path a1)	-0.013 (-0.040, 0.008)
Avoid (path a2)	0.085 (-0.327, 0.512)
FOA*Avoid (path a3)	-0.033* (-0.061, -0.006)
Step 3: Effects of FOA and HPA on inflammation¹	
HPA (path b)	-0.646* (-1.078, -0.143)
FOA (path c')	0.024 (-0.002, 0.049)
Probing Moderated Mediation	
Index of Moderated Mediation	0.019* (0.002, 0.045)
Conditional Indirect Effects	
-1 SD	-0.007 (-0.030, 0.017)
M	0.008 (-0.005, 0.029)
+1 SD	0.025* (0.001, 0.059)
Conditional Total Effects	
-1 SD	0.016 (-0.019, 0.051)
M	0.032* (0.002, 0.064)
+1 SD	0.050* (0.015, 0.091)

Notes
* = statistically significant at 95% credible interval
1. Steps 2 and 3 conducted in simultaneous multi-level structural equation model.
Covariates in all models include age, relationship duration, medication, salivary cotinine, and hours since awakening.
Conditional indirect and total effects are calculated at levels of attachment avoidance that are one standard deviation below the mean (-1 SD), at the mean (M), and one standard deviation above the mean (+1 SD).
Est = estimate, LLCI = lower limit of 95% credible interval, ULCI = upper limit of 95% credible interval, FOA = family of origin aggression, Avoid = romantic attachment avoidance, HPA = cortisol slope during dyadic interactions.



Symposium 1124

Stress, Health, and Salivary Markers of Inflammation: An Update and Opportunities for Future Research

Friday, March 13 from 10:45 am to 12:00 pm

STRESS, HEALTH, AND SALIVARY MARKERS OF INFLAMMATION: AN UPDATE AND OPPORTUNITIES FOR FUTURE RESEARCH

Yvette Z. Szabo, PhD, Biomarkers and Genetics Core, VA VISN 17 Center of Excellence for Research on Returning War Veterans, Waco, TX, Danica C. Slavish, PhD, Department of Psychology, University of North Texas, Denton, TX, Danica C. Slavish, PhD, Department of Psychology, University of North Texas, Denton, TX, Grant S. Shields, PhD, Center for Mind and Brain, University of California-Davis, Davis, CA, Rebecca G. Reed, PhD, Department of Psychology, University of Pittsburgh, Pittsburgh, PA, Nicolas Rohleder, PhD, Department of Psychology, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany, Christopher G. Engeland, PhD, Department of Biobehavioral Health and College of Nursing, The Pennsylvania State University, University Park, PA

Over the past 20 years, inflammation has been recognized as an important correlate of health. Recent work has explored saliva as an alternative medium in which to assess inflammation. Compared to blood, saliva is less invasive, cheaper, safer, and less burdensome to collect. This makes it a desirable medium in which to assess immune biomarkers both in and outside of laboratory settings, particularly in vulnerable samples. However, one of the obstacles to the broad implementation of salivary markers are its inconsistent associations with gold-standard blood-based markers. Furthermore, the literature regarding the stress reactivity of salivary markers of inflammation and their predictive utility for health is mixed.

This symposium will provide an update on the current literature linking stress and salivary markers of inflammation, as well as the latest research on their associations with health. First, we demonstrate that many, but not all, inflammatory cytokines reliably increase in response to acute stress (Slavish et al., abstract 1). This meta-analysis synthesizes associations with salivary inflammation and stress, with focus on the role of study quality, study methodology, and sample demographics in stress reactivity. Then, we present data on the

covariation of salivary cortisol and salivary IL-6 – a pro-inflammatory cytokine (Reed, abstract 2). These naturalistic results provide insight into within-person fluctuations of salivary inflammation, as well as how salivary inflammation is related to a more objective marker of stress. Next, the role of emotion in stress-related changes in IL-1 β is presented (Shields, abstract 3). Specifically, we replicate prior research by showing that greater avoidance-related emotions (anxiety) influence degree of stress reactivity, but approach emotions (anger) do not. Finally, we provide an overview of salivary and dried blood spot measures in the context of acute and chronic stress (Rohleder et al., abstract 4). This talk discusses benefits and limitations of both types of measures for their use in naturalistic studies.

Findings will be discussed in a broader context by expert in psychoneuroimmunology and salivary diagnostics, Dr. Christopher Engeland. Recommendations for future research will be provided, with consideration of best practices and how to implement salivary methods in vulnerable and at-risk samples.

Individual Abstract Number: 1128

The effect of acute stress on salivary markers of inflammation: A systematic review and meta-analysis

Danica C. Slavish, PhD, Department of Psychology, University of North Texas, Denton, TX, Jennifer E. Graham-Engeland, PhD, Department of Biobehavioral Health, The Pennsylvania State University, University Park, PA, Yvette Z. Szabo, PhD, Biomarkers and Genetics Core, VA VISN 17 Center of Excellence for Research on Returning War Veterans, Waco, TX

Salivary biomarkers of inflammation are increasingly being investigated in stress research. This pre-registered systematic review and meta-analysis provides a quantitative summary of the reliability of changes in salivary inflammatory markers in response to acute stress. The review included 1,432 participants from 34 unique samples from 26 studies obtained through electronic databases (PubMed, PsycINFO, Embase), reference treeing, and articles identified by a 2015 narrative review on a similar topic. To be eligible, articles had to be quantitative and assess change in at least one biomarker of salivary inflammation in response to acute stress in adults. The primary outcome was magnitude of change in inflammatory biomarkers following stress exposure (Cohen's d for repeated measures). Measures of salivary inflammation included: IL-2, IL-4, IL-5, IL-6, IL-8, IL-10, IL-12p70, IL-13, IL-17A, IL-18, IL-21, IL-1 β , CRP, TNF- α , IFN- γ , and IFN- α . Results indicate that cytokines IL-6 ($k = 23$, $d = 0.30$), IL-8 ($k = 5$, $d = 0.32$), IL-10 ($k = 9$, $d = 0.38$), TNF- α ($k = 9$, $d = 0.64$), and IFN- γ ($k = 4$, $d = 0.33$) significantly increased in response to stress. Post hoc sensitivity analyses revealed that IL-1 β also increased post-stress after removing two outlier studies ($k = 12$, $d = 0.25$). Examination of moderators suggested that study quality, study methodology, and sample demographics moderated some associations; for example, stressor length time was associated with stronger effect sizes for IL-6, TNF- α , and IL-1 β . Overall, this meta-analysis revealed that certain salivary inflammatory cytokines, but not all, increase in response to acute stress. Significant heterogeneity in results suggests need for standardization of future research protocols. Additional implications and directions for future research will be discussed.

Individual Abstract Number: 1129

Examining the psychological correlates of changes in a salivary marker of inflammation: Increases in negative affect predict increases in salivary interleukin-1 β

Grant S. Shields, PhD, Center for Mind and Brain, University of California-Davis, Davis, CA

Levels of salivary cytokines do not correlate well with levels of circulating cytokines, a finding which has prompted many to consider salivary cytokines useful only as markers of local inflammation. Recent research, however, has suggested that changes in salivary cytokines may index aspects of immune system activity that are either sensitive to systemic influence or relevant to psychological processes. For example, past work has shown that salivary cytokines are altered by stress and anxiety, and that salivary cytokines are potent predictors

of the effects of stress on cognitive processes, such as memory. The present study aims to conceptually replicate and extend some of these prior results by examining the association between changes in negative affect and changes in salivary interleukin (IL)-1 β in a sample of 58 individuals exposed to the cold pressor or a control task. Greater increases in negative affect from pre- to post-manipulation were associated with greater increases in salivary IL-1 β from pre- to post-manipulation, $r = .301$, $p = .022$, and this association held controlling for BMI, sex, and experimental condition, $\beta = .299$, $p = .018$. A more fine-grained approach to negative affect revealed that changes in anxiety, but not anger, were associated with changes in salivary IL-1 β , $r = .331$, $p = .011$. These associations held controlling for the other form of negative affect and relevant covariates. Although stress-induced changes in salivary cytokines may reflect a redistribution of immune system resources rather than novel synthesis of these cytokines, these results suggest that changes in salivary cytokines may index aspects of immune system activity that are relevant to psychological processes, such as negative affect. These findings encourage additional study of salivary cytokines to provide a better understanding of the factors that contribute to stress-induced changes in salivary cytokines and the mechanisms linking changes in salivary cytokines to psychological processes.

Individual Abstract Number: 1130

Covariation in Salivary Cortisol and IL-6: Between- and Within-Person Associations

Rebecca G. Reed, PhD, Department of Psychology, University of Pittsburgh, Pittsburgh, PA

Background: Cortisol is widely recognized as anti-inflammatory, but at any given moment, within-person associations between cortisol and cytokines are likely complex and time-dependent. The present investigation examined the stable between-person differences and dynamic within-person covariation in endogenous, naturally-occurring changes in salivary cortisol and salivary interleukin(IL)-6.

Method: Twenty-four healthy couples ($n=24$ males and $n=24$ females) provided saliva samples 4x per day for 5 days: waking, mid-morning (~4.3 hrs post waking), later afternoon (~10.4 hrs post waking), and bedtime (~15 hrs post waking). Saliva samples were assayed for cortisol and IL-6 using ELISAs (Salimetrics, LLC). Intra- and inter-assay CV's were 3.9% and 8.6% for cortisol and 9.6% and 6.6% for IL-6. Salivary IL-6 and cortisol were natural log transformed. Separate multilevel models for men and women that controlled for diurnal rhythm were used to test the between- and within-person associations between salivary cortisol and IL-6. In addition to concurrent models, time-lagged analyses of within-person effects were tested to examine whether cortisol levels at the previous time point associated with current levels of salivary IL-6.

Results: Between people, cortisol was negatively associated with IL-6 in men ($\gamma=-1.11$, $SE=.50$, 95% CI [-2.15, -0.07], $p=.038$) and women ($\gamma=-1.36$, $SE=.67$, 95% CI [-2.76, 0.032], $p=.057$), but the effect for women was not statistically significant. Within people, concurrent cortisol-IL-6 associations were not statistically significant in men ($\gamma=-.35$, $SE=.22$, $p=.11$) or women ($\gamma=-.16$, $SE=.18$, $p=.38$). However, there was a statistically significant lagged within-person effect in women ($\gamma=.43$, $SE=.16$, 95% CI [0.11, 0.74], $p=.008$; not in men, $p=.58$) such that higher cortisol at the previous time point was associated with higher salivary IL-6 at the following time point.

Conclusion: Cortisol may play an immunomodulatory role in regulating IL-6 localized in the oral cavity. Between people, cortisol displayed anti-inflammatory effects, but within people, cortisol and IL-6 positively covaried in women with a time lag. These results, which require replication in larger samples, call for a nuanced understanding of the HPA-immune relationship that considers positive and negative covariation and source of variation (inter- versus intra-individual).

Individual Abstract Number: 1127

Stress, Non-Invasive Measures of Inflammation, and Health - From the Laboratory to the Field

Nicolas Rohleder, PhD, Sarah Sturmbauer, MSc, Linda Becker, PhD, Department of Psychology, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany

The biological pathways between stress and disease have received substantial attention, primarily focusing on the role of the hypothalamus pituitary adrenal (HPA) axis and sympathetic nervous system (SNS). How activation of these stress systems translates into physiological disease, however, remains insufficiently understood. Recent research has focused on inflammation as a promising pathway, because stress systems affect the inflammatory system, elevated inflammation often accompanies chronic psychosocial distress, and inflammation plays a key role in diseases such as cardiovascular disease, diabetes, and cancer.

All of these systems can now be assessed using non- or minimally-invasive methods. Salivary biomarkers such as cortisol for HPA axis and alpha-amylase for SNS are well-established and widely accepted. Assessment of systemic inflammation has only recently progressed to methods that are feasible for out-of-lab deployment. Similar to cortisol and amylase, saliva also carries inflammatory proteins, including cytokines and C-reactive protein (CRP). In contrast to cortisol, inflammatory proteins in saliva do not necessarily reflect plasma concentrations, but have been shown to be responsive to acute stress.

A compromise between the requirements of field research and the goal to reliably estimate plasma concentrations of inflammatory cytokines is capillary blood, collected by finger-prick via dried blood spot (DBS). Many groups have demonstrated strong associations between plasma and DBS concentrations of CRP. Using salivary cortisol and alpha-amylase, as well as DBS-CRP measures, we showed that lifetime stress exposure was associated with alterations in stress system activity and increased peripheral inflammation, and that systemic inflammation is associated with frontal resting state asymmetry and athlete burnout. This presentation will discuss the promise of DBS to assess inflammation in light of some of the limitations of salivary markers.

Taken together, non- and minimally invasive biomarkers of stress system activity and systemic inflammation now allow assessment of stress, and health consequences of stress without the need for laboratory facilities and medical personnel. These methodological developments allow more broad investigation of the brain-to-periphery pathway, and will likely help advance our understanding of stress effects on health.

Symposium 1176

Hardships and Assets in Childhood: Associations with Health Outcomes across the Lifespan

Saturday, March 14 from 3:15 to 4:30 pm

HARDSHIPS AND ASSETS IN CHILDHOOD: ASSOCIATIONS WITH HEALTH OUTCOMES ACROSS THE LIFESPAN

Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Jennifer A. Sumner, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Farah Qureshi, ScD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Ruijia Chen, MS, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Shakira Suglia, ScD, Department of Epidemiology, Emory University, Atlanta, GA

Childhood adversity is related to increased risk of chronic disease later in life. However, less work has investigated whether hardships in childhood are associated with physiological dysregulation that may warn of future disease risk. Moreover, substantially less attention has focused on *assets* in childhood that can foster health and well-being in adulthood. This symposium brings five researchers together from a

range of career stages (graduate student, postdoctoral fellow, early career faculty, and mid-career faculty) to explore how both hardships and assets in childhood are associated with a variety of health outcomes in young, middle-age, and older adults. The first speaker will present findings from an ethnically diverse community sample of adolescents that examines whether experiences of violence and deprivation are associated with advanced biological aging (as calculated using algorithms combining information from ten biomarkers across different organ systems). Using data from the National Longitudinal Study of Adolescent Health, the second speaker will provide evidence that adolescent social assets related to parent-child relationship quality, school connectedness, and neighborhood social capital may help maintain higher levels of psychological well-being in the transition to adulthood. The third speaker will show that positive childhood experiences involving stable family environments, parental warmth, socioeconomic resources, and healthy parental behaviors may be associated with better executive function and episodic memory in midlife. The fourth speaker will discuss results suggesting that 11-year-old British children with greater psychosocial strengths – such as optimism, social connections, purpose, and satisfaction – tend to have healthier lipid profiles 30 years later. Finally, an expert on how social and environmental factors in childhood and adolescence are related to health will integrate findings and offer suggestions for future research. Taken together, this symposium makes use of unique cohorts to explore whether hardships and assets in early life are associated with physiological, psychological, and cognitive health outcomes. Such work builds upon the burgeoning evidence regarding the long-term effects of early life adversity on later life health, and highlights assets that may promote health and well-being across the life course.

Individual Abstract Number: 1308

Exposure to Early Experiences of Threat, and Not Deprivation, Are Associated with Greater Physiological Dysregulation in Youth
Jennifer A. Sumner, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Weijia Fan, MS, Biostatistics, Daniel W. Belsky, PhD, Epidemiology, Columbia University Mailman School of Public Health, New York, NY, Katie A. McLaughlin, PhD, Psychology, Harvard University, Cambridge, MA

Background: Early life adversity (ELA) has been linked to adverse health over the lifespan. Identifying indicators of physiological dysregulation in youth exposed to ELA before clinical disease onsets has the potential to inform screening and interventions aimed at offsetting disease risk. Estimating biological age (BA), rather than chronological age, provides an approach for assessing physiological changes in the integrity of the body's systems. We quantified BA in youth using algorithms that combine information from multiple biomarkers and tested whether types of ELA were associated with advanced BA.

Methods: A community-based sample of 85 children and adolescents [$M_{\text{age}}=14.4$ years ($SD=2.8$), 49.4% female, 21.2% Black, 12.9% Latino] provided blood samples for the following biomarkers: C-reactive protein, albumin, alkaline phosphatase, creatinine, cholesterol, blood urea nitrogen, and HbA1c. Resting systolic blood pressure and forced expiratory volume in one second were also measured. Youth's lifetime exposure to ELA [including experiences of threat (e.g., violence) and deprivation (e.g., neglect, food insecurity)] was assessed by querying youth and a caregiver. We implemented two BA algorithms validated in adults to calculate BA with data from the 10 biomarkers: 1) the Klemm-Doubal method (KDM) and 2) a homeostatic dysregulation measure that quantifies deviation from a reference based on biomarker Mahalanobis distance. Higher values on the standardized difference between KDM BA and chronological age and homeostatic dysregulation indicated greater BA advancement.

Results: Exposure to threat-related ELA was significantly associated with greater homeostatic dysregulation in a regression model adjusting for age, sex, race/ethnicity, and income-to-needs ratio ($\beta=0.46, p<.001$), whereas exposure to deprivation was not

($\beta=0.18, p=.17$). In models with both ELA types, threat-related ELA was uniquely related to greater homeostatic dysregulation ($\beta=0.47, p<.01$; deprivation: $\beta=-0.03, p=.86$). Only threat-related ELA was associated with greater BA advancement based on KDM BA, but this did not reach significance ($\beta=0.13, p=.45$; deprivation: $\beta=-0.06, p=.69$).

Conclusion: Together with research on ELA and advanced pubertal stage and epigenetic age, our findings suggest that threat-related ELA may be particularly associated with advanced BA in youth.

Individual Abstract Number: 1520

Social assets in youth are associated with trajectories of well-being during the transition to adulthood

Farah Qureshi, ScD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Background: Research consistently finds that psychological well-being (PWB; e.g., optimism, happiness) is associated with lower cardiovascular risk, but its early origins are poorly understood. Identifying and enhancing factors that promote PWB starting in adolescence may help youth establish positive health trajectories as they age. This study tests whether social assets in adolescence are associated with a greater likelihood of maintaining high levels of PWB from adolescence to young adulthood.

Methods: Data are from 14,322 youth in the National Longitudinal Study of Adolescent Health. Self-reported assets were measured at mean age 15, and PWB at mean age 15 and 22. Asset measures were based on 13 items assessing parent-child relationship quality, school connectedness, and neighborhood social capital. PWB was assessed using positively-worded items from the Center for Epidemiologic Studies Depression Scale and the Rosenberg Self Esteem Scale. PWB trajectories were defined as persistently high, high in adolescence only, high in adulthood only, and persistently low using tertiles of the sample. Baseline covariates included sociodemographics and depression.

Associations between assets and PWB trajectories were tested using multinomial logistic regression. Sensitivity analyses were conducted among those with high PWB at baseline to determine if assets predicted greater likelihood of maintaining high levels over time.

Results: Social assets were significantly associated with PWB trajectories, both individually and cumulatively. In fully adjusted models, each additional asset conferred a nearly 3 times greater likelihood of sustained high vs. persistently low PWB (Relative Risk Ratio [RRR]=2.88; 95% CI=2.51, 3.29). Social assets were also associated with high PWB occurring at only a single time point: in adolescence (RRR=2.14; 95% CI=1.94, 2.36) or in young adulthood (RRR=1.18; 95% CI=1.05, 1.30). Among those with high baseline PWB, each additional asset was associated with 5% greater likelihood of maintaining high levels (Incidence Rate Ratio=1.05; 95% CI=1.04, 1.07).

Conclusions: An asset-based approach to cardiovascular health promotion requires identifying upstream determinants of PWB. Results find that social assets may be psychologically protective as youth transition to adulthood, with possible implications for chronic disease over the life course.

Individual Abstract Number: 1577

Positive Childhood Experiences and Cognitive Function in Late Life

Ruijia H. Chen, MS, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Jennifer Weuve, ScD, Department of Epidemiology, Boston University School of Public Health, Boston, MA, David R. Williams, PhD, Laura Kubzansky, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Background While early childhood may expose individuals to adversities, it is also a period when children are provided with support

resources for thriving. Prior research has linked positive childhood experiences (PCE) to better physical and mental health outcomes, but their roles in cognitive outcomes have received much less attention. This study aims to quantify the association between PCE and levels of cognitive function and rates of cognitive decline among adults.

Methods Data of this study come from the Midlife Development in the United States (MIDUS), a longitudinal survey of noninstitutionalized adults in the United States. PCE was measured by questions on the following five components measured at either MIDUS1 or MIDUS2: 1) high parental socioeconomic status, 2) stable family environment, 3) favorable parental health behavior, 4) high parental warmth, and 5) favorable parental health. The outcomes, executive function and episodic memory, were measured by the well-validated Brief Test of Adult Cognition by Telephone (BTACT).

We first conducted generalized estimating equation (GEE) analyses to estimate the associations between PCE and levels of executive function and episodic memory. We then fitted linear mixed models to quantify associations between PCE and changes in executive function and episodic memory over ten years. We used multiple imputations for missing data and inverse probability weighting (IPW) to adjust for differential censoring and survival.

Results A total of 4,298 adults (age range: 28-84) were included in the analyses. After controlling for age, sex, race, and adverse childhood experiences, PCE was positively associated with levels of executive function (beta =0.05, 95% CI=0.03-0.07) and episodic memory (beta =0.03, 95% CI=0.01-0.05). However, we did not find associations between PCE and changes in cognitive function between MIDUS2 and MIDUS3.

Conclusion PCE is positively associated with levels of cognitive function but not with rates of cognitive decline. Future studies should continue to investigate the psychosocial, behavioral, and biological mechanisms underlying PCE and late-life cognitive outcomes. Interventions and programs that aim to promote positive childhood experiences may have positive impacts on cognitive outcomes in late life.

Individual Abstract Number: 1303

Psychosocial Strengths in Childhood and Lipid Profiles Thirty Years Later: Findings from the 1958 British Birth Cohort

Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA

Background:

Unhealthy lipid profiles are associated with atherosclerosis and are a major risk factor for cardiovascular disease. Abnormal lipid levels may occur as early as childhood or adolescence. As such, this period in life may be a prime time for prevention efforts, before trajectories towards poor health are established. Researchers have identified psychosocial factors in adulthood that are associated with healthy lipid profiles, but less work has evaluated psychosocial factors in childhood that may promote healthy lipids into adulthood. We hypothesized that children with higher versus lower levels of psychosocial strengths (e.g., positive emotions, satisfaction, optimism, and social connections) would have healthier lipid profiles in midlife.

Methods:

Data were from the 1958 British Birth Cohort, which has followed participants from birth through adulthood. At age 11, participants wrote an essay about how they expected their life to be when they were 25 years old. Two trained coders rated 5,463 essays for 9 psychosocial strengths. We averaged across all strengths to derive an overall score (range 1-7; $\alpha=.82$). Total cholesterol, triglycerides, high-density lipoprotein cholesterol (HDL-C), and low-density lipoprotein cholesterol (LDL-C) were clinically-assessed at age 45. After multiple imputation of missing variables, linear regression analyses examined associations in unadjusted models and then models controlling for covariates in childhood and adulthood.

Results:

Consistent with a healthy lipid profile, unadjusted models showed that childhood psychosocial strengths were modestly associated with lower

levels of total cholesterol (b=-.06, 95% CI=-.09, -.02), triglycerides (b=-.14, 95% CI=-.19, -.09), and LDL-C (b=-.03, 95% CI=-.06, .001), as well as higher levels of HDL-C (b=.03, 95% CI=.02, .04). Adjusting for child covariates (sex, financial hardship, cognitive ability, essay word count, financial hardship, heart complaints, height, weight) and adult cardiovascular medication use yielded similar but attenuated results.

Conclusions:

This study uses novel methods to assess childhood psychosocial strengths and consider their relation with lipid profiles in midlife. Findings suggest that strengths in childhood may be related to healthier lipid levels in later life, but further work is necessary to see if associations are independent of key covariates.

Symposium 1206

Improving health equity with mobile technology

Friday, March 13 from 10:45 am to 12:00 pm

IMPROVING HEALTH EQUITY WITH MOBILE TECHNOLOGY

John F. Hunter, PhD, Psychological Science, UC Irvine, Irvine, CA, John Hunter, PhD, Psychological Science, UC Irvine, Irvine, CA, Adrian Aguilera, PhD, Social Welfare, UC Berkeley, Berkeley, CA, Charles R. Jonassaint, PhD, Medicine, University of Pittsburgh, Pittsburgh, PA, Betina Yanez, PhD, Medical Social Sciences, Northwestern University, Evanston, IL, Carissa A. Low, PhD, Medicine, University of Pittsburgh, Pittsburgh, PA

Mobile technology holds great potential to alleviate health disparities and improve health equity. By leveraging the popularity, ubiquity and technological capabilities of mobile technology; researchers can develop cost-effective, efficient, and scalable mobile health (mHealth) interventions to help a variety of populations. Certain marginalized and underserved groups that have been faced barriers to quality healthcare services may benefit from the affordances of culturally appropriate and targeted mHealth interventions designed to serve their needs. The first presenter will provide a brief overview about current evidence and future directions for how mHealth interventions may reduce health disparities for certain marginalized groups, namely, ethnic and racial minorities including Latinx and African-Americans, rural populations, individuals experiencing homelessness, and sexual and gender minorities. The second presenter will present research about the development, implementation, and efficacy of a texting adjunct to cognitive behavioral therapy for Latino immigrants with depression. The third presenter will discuss the use of Painimation, an electronic assessment tool that uses visual animations to assess pain quality, type and location. The final presenter will discuss the preliminary efficacy of My Guide, a smartphone application aimed at improving health related quality of life for Hispanic women who are survivors of breast cancer. Together, this work highlights the emerging progress, vast future potential and fundamental challenges that characterize the development and implementation of mHealth interventions to reduce health disparities and improve health equity.

Individual Abstract Number: 1369

Use of Digital Mental Health for Marginalized and Underserved Populations

John Hunter, PhD, Stephen Schueller, PhD, Psychological Science, UC Irvine, Irvine, CA, Adrian Aguilera, PhD, Caroline Figueroa, MD, PhD, Social Welfare, University of California, Berkeley, Berkeley, CA Digital mental health (DMH) interventions provide opportunities to alleviate mental health disparities among marginalized populations by overcoming traditional barriers to care and putting quality mental health services in the palm of one's hand. While progress has been made towards realizing this goal, the potential for impactful change has yet to be fully realized. This presentation will review current examples of DMH interventions for certain marginalized and

underserved groups, namely, ethnic and racial minorities including Latinx and African-Americans, rural populations, individuals experiencing homelessness, and sexual and gender minorities. Strengths and opportunities, along with the needs and considerations, of each group are discussed as they pertain to the development and dissemination of DMH interventions. This presentation focuses on several DMH interventions that have been specifically designed for marginalized populations with a culturally sensitive approach along with other existing interventions that have been tailored to fit the needs of the target population. Overall, evidence is beginning to show promise for the feasibility and acceptability of DMH interventions for these groups, but large-scale efficacy testing and scaling potential are still lacking. As it stands, DMH interventions still hold a lot of potential to help diverse groups, but now, that potential needs to be translated into reality and action. These examples of how DMH can potentially positively impact marginalized populations should motivate developers, researchers, and practitioners to work collaboratively with stakeholders to deliver DMH interventions to these underserved populations in need.

Individual Abstract Number: 1367

MoodText:Automated texting as an adjunct to CBT for Depression among Latinos

Adrian Aguilera, PhD, Caroline A. Figueroa, MD PhD, Rosa Hernandez Ramos, BA, Social Welfare, UC Berkeley, Berkeley, CA

Background: Mobile technology has shown to increase the effectiveness of Cognitive Behavioral Therapy (CBT) and other psychotherapy interventions for depression. Text messaging might be a particularly desirable tool because of its low cost and wide use across socio-economic and demographic groups. However, though text-messaging interventions have shown great promise, it remains unknown whether demographic, clinical and baseline texting characteristics of patients influence the effectiveness of texting interventions. We aim to study 1) whether increased engagement in an automated text messaging system predicts CBT attendance 2) whether clinical, demographic and baseline texting variables moderate the relationship between engagement in the text messaging intervention and CBT attendance.

Methods: 92 predominantly low-income Spanish-speaking patients with mild to moderate depression participated in an automated text messaging intervention added to 16 weeks of CBT. Patients received daily mood-monitoring messages. We collected message response rates, clinical factors, demographics and baseline texting behavior. We conducted mixed-effects logistic regression analyses to examine whether weekly text-message response-rates predicted weekly CBT attendance. We additionally examined whether demographic (i.e. age, sex, income), clinical (mood scores and medication-use), and baseline texting variables (texting preference and knowledge) moderated the relationship between responding and attending CBT.

Results: Patients attended a mean of 8.14 CBT sessions (out of 16) and responded to a mean of 50% of text-messages. Higher weekly responding predicted CBT attendance that week (OR: 4.86 for one extra day of responding, $p < 0.001$). Out of the examined clinical, demographic and baseline texting variables only age was a moderator: the predictive effect of higher responding on attending more psychotherapy sessions was lower in older patients (significant interaction between responding and age (OR=0.93, $p=0.011$)).

Conclusion: Our findings support the use of adjunct text messaging systems to CBT in low-income ethnic minority patients. Increased responding to texts might be a useful predictor of psychotherapy attendance in clinical practice. Results of this study suggest that age might have an influence on the effectiveness of text messaging interventions.

Individual Abstract Number: 1368

Evaluating a novel technology-based tool for assessing central sensitization in adults with chronic pancreatitis

Charles R. Jonassaint, PhD, Medicine, Anna Evans Phillips, MD, GI, University of Pittsburgh, Pittsburgh, PA

Chronic Pancreatitis (CP) is a debilitating fibro-inflammatory disease of the pancreas that manifests with abdominal pain. Response to interventions is highly variable and unpredictable, and there is no clinical marker to predict which patients will respond to intervention. Quantitative sensory testing (QST) is able to provide a nociceptive evaluation of pancreatic nerves in CP which allows for objective pain phenotyping. Patient-reported outcomes (PRO) have been used in other pain populations to phenotype pain and predict treatment response. This has not been tested in CP and the unique features of visceral CP pain make existing PRO tools used for testing somatic pain hard to interpret. Mobile technology provides an opportunity to implement PRO tools that can meet the unique needs of CP patients. In this study, we are testing *Painimation*, an electronic, animation-based PRO tool to assess pain location, quality, and intensity among adults with chronic pain. The study aims to determine if *Painimation* can 1) differentiate CP pain from chronic somatic pain and 2) determine whether the characteristics of pain described using *Painimation* are associated with QST phenotypes.

METHODS. 41 patients with chronic pain enrolled: 18 CP and 23 control. All participants completed *Painimation* on a mobile tablet, and paper versions of Pain Interference, modified Brief Pain Inventory, and Pain Catastrophizing Scale. Participants underwent QST testing to phenotype their nociception. *Painimation* data was compared between patients with CP and controls. QST phenotypes were compared between CP and controls. Association was tested between *Painimation* responses and QST phenotypes.

RESULTS. Initial comparison between CP and control patients shows that CP patients are much more likely to choose a stabbing pain (50% vs 21.7%). Burning (66.7%) and throbbing pain (55.6%) were also more likely to be selected by CP patients than controls (both 43.5%). Complete data for association of QST phenotypes is pending at the time of submission.

CONCLUSION. *Painimation* is a novel bedside clinical PRO tool that informs providers about pain characteristics. We will explore whether *Painimation* is associated with QST pain phenotypes and whether graphical descriptions of pain response may be useful for understanding nociceptive experience.

Individual Abstract Number: 1371

Brief Culturally Informed Smartphone Intervention Decreases Breast Cancer Symptom Burden among Latina Breast Cancer Survivors

Betina Yanez, PhD, Laura B. Oswald, PhD, Sharon H. Baik, PhD, Diana Buitrago, BS, Medical Social Sciences, Northwestern University, Evanston, IL, Francisco Iacobelli, PhD, Computer Science, Northeastern Illinois University, Chicago, IL, Alejandra Perez-Tamayo, MD, Surgery, University of Illinois at Chicago, Chicago, IL, Judy Guitelman, BA, ALAS-WINGS, Latina Association for Breast Cancer, Chicago, IL, Frank J. Penedo, PhD, Psychology, University of Miami, Coral Gables, FL, Joanna Buscemi, PhD, Psychology, DePaul University, Chicago, IL

Objective: Latina breast cancer survivors (BCS) report more symptom burden and poorer health-related quality of life than non-Latina BCS. However, there are few evidence-based and culturally informed resources that are easily accessible to this population. This study aimed to establish the feasibility and preliminary efficacy of the My Guide and My Health smartphone applications among Latina BCS. Both applications are culturally informed and contain evidence-based information for reducing symptom burden and improving health-related quality of life (My Guide) or healthy lifestyle promotion (My Health). **Methods:** Participants (N=80) were randomized to use the My Guide or My Health smartphone applications for six weeks. Assessments occurred at baseline (T1), after the six-week intervention (T2), and two weeks post-T2 (T3). Outcomes were participant recruitment and retention rates, patient-reported satisfaction, and validated measures of symptom burden and health-related quality of life. **Results:** Recruitment was acceptable (79%), retention was excellent (>90%), and over 90% of participants were satisfied with their application. On average, participants in both conditions used the

applications for more than one hour per week. Symptom burden declined from T1-T2 across both conditions ($p < .05$), but this decline was not maintained at T3. Breast cancer well-being improved from T1-T2 across both conditions and was maintained at T3. **Conclusions:** Latina BCS who used the My Guide and My Health applications reported temporary decreases in symptom burden and improved breast cancer well-being over time, though there were no differential effects between conditions. Findings suggest that technology may facilitate Latina BCS engagement in care after completion of breast cancer treatment.

Symposium 1243

Biopsychosocial Correlates and Temporal Patterns of Fatigue in Patients with Recurrent Acute or Chronic Pain Conditions

Saturday, March 14 from 3:15 to 4:30 pm

BIOPSYCHOSOCIAL CORRELATES AND TEMPORAL PATTERNS OF FATIGUE IN PATIENTS WITH RECURRENT ACUTE OR CHRONIC PAIN CONDITIONS

Ian A. Boggero, Ph.D., Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, Ian A. Boggero, Ph.D., Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, Krystal Morgan, Ph.D, Transplant, University of North Carolina at Chapel Hill Hospitals, Chapel Hill, NC, Kristy Themelis, Ph.D., Neuroscience, Brighton and Sussex Medical School, University of Sussex, Brighton, NA, United Kingdom, Marcia V. Rojas Ramirez, D.D.S, Oral Health Practice, College of Dentistry, University of Kentucky, Lexington, KY

Fatigue, defined as a generalized feeling of being out of energy, is one of the most prevalent and debilitating symptoms experienced by patients living with conditions of chronic or recurrent acute pain. In fact, patients often report that fatigue is even more disruptive to their daily activities than pain. Despite the importance of fatigue in pain conditions, it is often overlooked in clinical practice and research, and relatively little is known about factors that predict fatigue, or about how fatigue changes over time in pain disorders. This symposium contains four talks that aim to characterize the biopsychological correlates and temporal patterns of fatigue over days, weeks, months, and years in patients with recurrent or chronic pain. The first speaker will examine associations between psychological, sleep, and experimental pain variables with fatigue in patients with temporomandibular joint disorder and will describe temporal patterns of fatigue over three months in this population. The second speaker will use ecological momentary assessment to characterize daily patterns of fatigue and associations between self- and parent-reported fatigue and quality of life in youth with sickle cell disease and pain. The third speaker will describe autonomic and inflammatory alterations that occur following experimentally-induced fatigue in patients with fibromyalgia and/or ME/CFS. Finally, the last speaker will describe how fatigue changes over 2-8 years in patients with chronic orofacial pain. Together, the four talks will provide a comprehensive examination of biopsychosocial correlates of fatigue in pain disorders using diverse methodologies (cross-sectional, experimental, ecological-momentary, and longitudinal) and clinical recurrent and chronic pain populations (temporomandibular joint disorder, pediatric sickle cell disease, chronic fatigue syndrome, fibromyalgia, orofacial pain). Additionally, the talks will paint a comprehensive picture of how fatigue and pain are associated across time. It is the hope of the speakers that this symposium will elucidate the clinical relevance of assessing fatigue in pain disorders, and that it will exemplify cutting-edge research in this multidisciplinary area of study.

Individual Abstract Number: 1544

BIOPSYCHOSOCIAL CORRELATES AND TEMPORAL PATTERNS OF FATIGUE IN TEMPOROMANDIBULAR JOINT DISORDER

Ian A. Boggero, Ph.D., Christopher D. King, Ph.D., Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

Patients with Temporomandibular Joint Disorder (TMJD), characterized by facial pain lasting three or more months, often experience significant fatigue, which in turn can result in pain-related interference with daily activities. Yet, little is known about correlates of fatigue in TMJD, or about how fatigue changes over time. The current study aimed to shed light on these two areas using data from 40 participants with TMJD (Mean age=30.40, $SD=6.19$) and 22 healthy controls (HC; Mean age=27.78, $SD=7.07$). Participants came into the lab for two visits. At visit one, they were assessed for TMJD, completed psychological and sleep questionnaires, and underwent pain testing to assess perceived intensity of thermal pain and pressure pain thresholds. At visit two, they self-reported fatigue over the past 7 days (PROMIS Fatigue) and underwent a pain induction requiring them to submerge their hand in cold water. Between visits, they provided nightly actigraphy data for 7 days. Finally, participants completed online surveys of fatigue for 12 consecutive weeks following the second visit. Linear regressions tested whether fatigue was associated with psychological (depression, anxiety, somatization), physiological (thermal pain intensity, pressure pain thresholds, and pain intensity following cold immersion), and sleep-related (self-reported sleep quality, actigraphy-derived efficiency, actigraphy-derived wake-after-sleep-onset) variables. Repeated measures ANOVA was used to describe longitudinal trajectories of fatigue. In both the TMJD and HC groups, fatigue was positively associated with depression ($\beta=.46, p<.001$), anxiety ($\beta=.49, p<.001$), somatization ($\beta=.57, p<.001$), and perceived intensity of cold pain following hand submersion ($\beta=.38, p=.003$). Fatigue was negatively associated with positive affect ($\beta=-.33, p=.01$) and self-reported sleep quality ($\beta=-.62, p<.001$). No other associations were significant, and fatigue was similarly associated with outcomes in both the TMJD and HC groups. Participants with TMJD reported higher levels of fatigue than the HC group on all 12 follow-up timepoints, but there were no significant group X time interactions, suggesting similar fatigue trajectories between groups. Results help elucidate the correlates and temporal patterns of fatigue in TMJD and provides scaffolding for future work on fatigue in TMJD.

Individual Abstract Number: 1537

THE RELATIONSHIP OF FATIGUE AND QUALITY OF LIFE IN YOUTH WITH SICKLE CELL DISEASE WHO EXPERIENCE PAIN

Krystal Morgan, Ph.D, Transplant, University of North Carolina at Chapel Hill Hospitals, Chapel Hill, NC, Lisa Campbell, Ph.D., Psychology, Beng Fuh, M.D., Pediatrics, East Carolina University, Greenville, NC, Angela Pascale, B.S., Jelaina Shipman, M.A., Mona Quarless, M.Ed., Cecelia Valrie, Ph.D., Psychology, Virginia Commonwealth University, Richmond, VA

Fatigue is a problematic symptom that has only recently gained attention in the literature on pediatric sickle cell disease (SCD). Preliminary research indicates worse fatigue is related to high pain. Research is needed to better understand fatigue presentation and impact in youth with SCD, particularly for youth who experience pain. The current study sought to expand on previous literature to capture a more comprehensive picture of fatigue in these youth by: (1) characterizing fatigue frequency in youth with SCD who experience pain using daily ecological momentary assessments (EMAs), and (2) examining the unique relationships between fatigue symptoms, fatigue frequency, and QOL. Twenty-eight youth with SCD (aged 8-17 years old), who had at least one pain episode in the past year, and their guardians were recruited from two regional pediatric SCD clinics. Youth and their guardians reported on the youth's QOL using the Pediatric QOL Core Scale (PedsQL) and on the youth's fatigue symptoms using the PedsQL Multidimensional Fatigue Scale. The

youth then completed daily EMAs for up to 4 weeks where they reported if they were tired that day. Regression analyses were calculated predicting QOL using fatigue symptoms and fatigue frequency as indicated by percentage of tired days reports on the EMAs. Youth reported being tired an average of 39% of EMA days ($SD = 28\%$, Range = 0%-100%). The regression models predicting parent and self-reported QOL were significant (R^2 range = .53 - .63, $p < .01$). High parent-reported fatigue symptoms ($t = 4.98$, $p < .01$) and high percentage of tired days ($t = -2.62$, $p = .02$) uniquely predicted worse parent-reported QOL. High self-reported fatigue symptoms ($t = 2.73$, $p = .01$) and high percentage of tired days ($t = -2.26$, $p = .03$) uniquely predicted worse self-reported QOL. Results indicate that youth with SCD who experience pain tend to experience fatigue frequently. They also support the conceptualization of fatigue as a multifaceted construct and the need to systematically assess both fatigue symptoms and frequency in these youth. Future research is needed to better understand the range of biopsychosocial factors leading to fatigue in youth with SCD and mechanisms linking fatigue to poor health outcomes in this and other pediatric pain populations to develop more targeted interventions.

Individual Abstract Number: 1563

AUTONOMIC FUNCTION TESTING: RELEVANCE TO INFLAMMATION AND AUTONOMIC INDUCED PAIN AND FATIGUE IN FIBROMYALGIA AND ME/CFS

Kristy Themelis, Ph.D., Neuroscience, Brighton and Sussex Medical School, University of Sussex, Brighton, NA, United Kingdom, Marisa Amato, MSc, Neuroscience, Brighton and Sussex Medical School, Falmer, NA, United Kingdom, Beth Thompson, Bsc, Robyn Stocks, BSc, Brighton and Sussex Medical School, University of Sussex, Falmer, NA, United Kingdom, Amy Pound, Bsc, Neuroscience, Brighton and Sussex Medical School, Falmer, NA, United Kingdom, Zdenka C. Cipinova, MA, Clinical Investigation & Research Unit (CIRU), Brighton and Sussex Medical School, Falmer, NA, United Kingdom, Lorraine Shah-Goodwin, BSc, Jean Timeyin, BA, Andrew Barrit, MBBS, Clinical Investigation & Research Unit (CIRU), Neil A. Harrison, PhD, Immunopsychiatry Research Group, Brighton and Sussex Medical School, Falmer, NA, United Kingdom, Hugo D. Critchley, DPhil, Trafford Centre for Medical Research, Brighton and Sussex Medical School, Falmer, United Kingdom, Kevin A. Davies, FRCP, Chair of Clinical and Experimental Medicine, Jessica A. Eccles, PhD, Neuroscience, Brighton and Sussex Medical School, Falmer, NA, United Kingdom

Autonomic dysregulation and inflammatory alterations are reported in patients with Fibromyalgia (FM) and/or ME/CFS which may be linked to pain, fatigue and cognitive symptoms. This study investigates the possible interactions of these processes and their contributions to signs and symptoms. Forty-nine patients with FM and/or ME/CFS were recruited for this study along with twenty healthy controls. Blood pressure (BP) and Heart rate (HR) were measured under Valsalva manoeuvre, a mental arithmetic task, a hyperventilation task, deep breathing, standardised isometric contraction, and cold pressor; all underwent pre-post measurements of pain and fatigue during upright tilt at 60 degrees and the active standing test (AS). In addition, participants underwent an experimental inflammatory challenge (typhoid vaccination) versus placebo (saline injection) on separate randomized counterbalanced visits with pre-post measurements of pain and fatigue. Regression analyses were used for correlations across groups. Inflammation-induced self-reported overall fatigue correlated with change in diastolic BP during Valsalva. Inflammation induced self-reported mental fatigue correlated with mean change in diastolic BP during hyperventilation. Inflammation induced change in self-reported physical fatigue correlated with mean change in HR during deep breathing, mean change in systolic BP during hyperventilation and mental arithmetic. Inflammation induced change in pressure pain thresholds (thumb) correlated with change in diastolic BP during mental arithmetic. Inflammation induced change in HR change in AS correlated with change in systolic BP and HR during mental arithmetic. Tilt induced self reported mental fatigue correlated

diastolic BP change during mental arithmetic. Tilt induced self-reported physical fatigue correlated with change in diastolic BP during hyperventilation. These findings suggest an association between baseline autonomic function and inflammation and autonomically-mediated pain and fatigue, including in patients with FM and ME/CFS. Ongoing work will link this data to neuroimaging, transcriptomics and variants in connective tissue providing mechanisms for understanding previously poorly characterized conditions and suggesting treatment targets for conditions with considerable comorbidity.

Individual Abstract Number: 1564

AFTER THE PAIN IS GONE: A LONGITUDINAL INVESTIGATION INTO HOW FATIGUE CHANGES AFTER CHRONIC OROFACIAL PAIN RESOLVES

Marcia V. Rojas Ramirez, D.D.S., Oral Health Practice, College of Dentistry, University of Kentucky, Lexington, KY, Ian Boggero, Ph.D., Behavioral Medicine and Clinical Psychology, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

Chronic orofacial pain, defined as persistent pain in the mouth, face, or head, is commonly associated with severe fatigue. However, it is unclear what happens to symptoms of fatigue after the underlying orofacial pain conditions resolve. To examine this question, we re-contacted 238 patients seeking treatment for orofacial pain 2-8 years after their initial appointment (Mean length between assessments: 5.18 years, $SD = 1.68$ years). We asked them to complete online questionnaires of their pain and fatigue using the same measures that they completed at their initial appointment (Visual Analog Scale to assess pain intensity; Multidimensional Fatigue Symptom Inventory-Short Form to assess fatigue). Of the 238 people, 52 reported being pain-free 2-8 years later (Mean age = 54.45, $SD = 11.47$, % female = 75.0), while the other 186 reported still having pain (Mean age = 48.23, $SD = 13.24$, % female = 90.3). At the initial time point, participants who later became pain-free had lower levels of fatigue ($M = 8.88$, $SD = 19.10$) than participants who later remained in pain ($M = 18.24$, $SD = 21.08$; $t = 2.89$, $p = .004$). At the follow-up time point, fatigue was nearly non-existent in the pain-free group ($M = 2.81$, $SD = 15.56$) but was elevated in the group still in pain ($M = 22.70$, $SD = 20.98$; $t = 6.36$, $p < .001$). Similar results were found when controlling for years between initial appointment and follow up. These findings are the first to our knowledge to examine how fatigue changes after chronic pain resolves. They have important clinical implications because they suggest that 1) baseline levels of fatigue may predict pain trajectories, and 2) they demonstrate that after pain resolves, levels of fatigue appear to normalize. Important theoretical work should continue to explore the mechanisms by which pain and fatigue may mutually maintain each other, and the potential for therapeutic interventions to interrupt this cycle by decreasing fatigue symptoms.

Symposium 1253

Integrating Animal and Human Experimental Models of Anxiety and Depression

Friday, March 13 from 4:15 to 5:30 pm

INTEGRATING ANIMAL AND HUMAN EXPERIMENTAL MODELS OF ANXIETY AND DEPRESSION

Joshua H. Cho, MD, PhD, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at UCLA, Los Angeles, CA, Mandy Bekhbat, PhD, Department of Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA, John F. Sheridan, PhD, College of Dentistry, Ohio State University, Columbus, OH, Sahib Khalsa, MD, PhD, Laureate Institute for Brain Research, Laureate Institute for Brain Research, Tulsa, OK, Joshua H. Cho, MD, PhD, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at UCLA, Los Angeles, CA

Neuroendocrine and neuroimmune mechanisms have been implicated in the stress response and the development of depression and anxiety. However, mechanistic research focusing on depression and anxiety has been conducted mostly in the context of animal models and human observational studies. Human experimental studies and attempts to integrate preclinical and clinical experimental models in a coherent unifying narrative have been infrequent, despite recent arguments that modeling anxiety and depression in humans by combining anxiety- and depression-induction procedures with neurocircuit measures provides a key intermediate bridge between basic and clinical sciences. We propose to convene a panel of preclinical and clinical researchers ranging from early to senior career stages to integrate novel findings on animal and human experimental models of anxiety and depression. First, we discuss the role of microglia-related immune mechanisms for stress sensitization by an exposure of mice to repeated social defeat (RSD) and recurrence of anxiety-like behavior in response to a secondary stress or immune challenge. Second, we describe how adolescent exposure of rats to chronic stress sensitizes the neuroinflammatory and neuroendocrine response to a subsequent immune challenge, with a focus on sex differences. Third, we provide evidence for the existence of neural circuits outside of the amygdala responsible for processing interoceptive (adrenergically-mediated) threat signals in clinically anxious patients. Lastly, we present a human experimental model of depression and anxiety using low-dose intravenous endotoxin as an inflammatory challenge.

Individual Abstract Number: 1258

Divergent Inflammatory and Behavioral Manifestation of Chronic Adolescent Stress Effects in Males and Females

Mandy Bekhbat, PhD, Department of Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA, Gretchen Neigh, PhD, Anatomy & Neurobiology, Virginia Commonwealth University, Richmond, VA

Background: Chronic adolescent stress (CAS), a risk factor for mood disorders, sensitizes the neuroinflammatory response following an immune challenge in rats. Here we hypothesized that biological sex would dictate differential anxiety-related behavior, adult immune transcriptome induction, and immune cell involvement in the hippocampus following adolescent stress in males and females.

Methods: Male and female adolescent rats were handled daily or underwent CAS (postnatal days 38-49; n=6-8 per group). Performance on the open field and social interaction tasks were then assessed. In adulthood, separate cohorts of rats were collected for RNA-Seq, qRT-PCR, flow cytometry, and immunohistochemistry at 2 or 4 hours after a single saline or lipopolysaccharide (LPS) injection.

Results: CAS led to anxiety-like behavior in adolescence ($B=-0.638$, $SE=0.289$, $p=0.027$). As adults, CAS rats of both sexes displayed exaggerated enrichment of the NF κ B mRNA pathway as indicated by normalized enrichment scores from gene set enrichment analysis. In contrast, only CAS females showed exaggerated glucocorticoid receptor (GR) pathway enrichment. A history of CAS augmented hippocampal mRNA expression of both CCL2 ($F(1,105)=7.045$,

$p<0.05$) and CXCL11 ($F(1,105)=4.201$, $p<0.05$). Although CAS did not impact the proportion of infiltrating leukocytes ($F(1,40)=0.222$, $p=0.640$), CAS increased the number of perivascular CD45⁺ cells in the hippocampus ($F(1,36)=8.522$, $p=0.006$) of both sexes. However, CAS increased morphological complexity of microglia in female ($B=0.143$, $SE=0.069$, $p=0.038$), but not male ($B=0.044$, $SE=0.104$, $p=0.674$), rats. Conversely, social behavior was impacted in males ($B=0.929$, $SE=0.385$, $p=0.016$), but not females ($p=0.1$).

Conclusions: Here we demonstrated sex differences in the effects of adolescent exposure to chronic stress which included immediate and long-lasting anxiety-related behavior, and a profound remodeling of the hippocampal immune milieu such as exaggerated immune transcriptome, altered microglial morphology, and perivascular immune cell presence. These results demonstrate that although the precise dynamics are divergent, adolescent stress is sufficient to alter behavior and the neuroimmune response in both sexes.

Individual Abstract Number: 1257

Microglia Are Necessary for Recall of Anxiety-Like Behavior

John F. Sheridan, PhD, College of Dentistry, Jonathan Godbout, PhD, Department of Neuroscience, Ohio State University, Columbus, OH

Background: Exposure to social stress is associated with the development of anxiety-like behavior in a pre-clinical mouse model repeated defeat. Repeated social defeat (RSD) is accompanied by enhanced release of glucocorticoid resistant (GCR) myeloid cells from the bone marrow that traffic to the brain in response to microglial activation. In addition, RSD promotes sensitization. Exposure to acute stress 24 days after stress cessation leads to recurrence of anxiety. The purpose of this study was to examine the role of microglia in stress sensitization.

Methods: Mice were exposed to six cycles of RSD, and microglia were eliminated by treatment with CSF-1R antagonist (PLX5622). Microglia were allowed to repopulate for 14 days and response to acute stress or immune challenge was determined 24 days after primary exposure to RSD.

Results: Twenty-four days after RSD exposure, microglia maintained a unique messenger RNA signature (n=6 RNA samples; $p1.5$). Moreover, elimination of

RSD-sensitized microglia prevented monocyte accumulation in the brain and blocked anxiety recurrence following exposure to acute stress (n=9-10 mice; stress x intervention, $F(1,40)=5.20$, $p<0.02$). Repopulation of microglia, followed exposure to acute stress, resulted in monocyte accumulation in the brain and anxiety in RSD-sensitized mice. The behavioral response was unaffected by microglial elimination/repopulation. Following immune challenge, there was robust microglial reactivity. However, microglial elimination/repopulation prevented the amplified immune reactivity ex vivo and in vivo in RSD-sensitized mice.

Conclusions: Microglia and neurons remain sensitized for weeks after exposure to RSD, and only the immune reactivity component of RSD-sensitized microglia was prevented by microglia elimination/repopulation.

Individual Abstract Number: 1601

Neural Circuitry Underlying Interoceptive Fear Across the Anxiety Disorders

Sahib Khalsa, MD, PhD, Justin S. Feinstein, PhD, Laureate Institute for Brain Research, Laureate Institute for Brain Research, Tulsa, OK

Background: No threat is more proximal to survival than a threat from within the body, yet neuroscience research investigating fear has focused almost exclusively on exteroceptive threats conveyed through canonical visual, auditory, olfactory, or somatosensory channels. Moreover, stimulation with interoceptive threat signals (such as carbon dioxide or isoproterenol, a beta-adrenergic agonist similar to adrenaline) triggers excessive fear in amygdala-lesion patients, highlighting the existence of circuits outside of the amygdala responsible for processing interoceptive threat. This study investigated how the brains of highly anxious individuals sense cardiorespiratory changes like heart palpitations and dyspnea.

Methods: Twenty clinically anxious individuals (mean Anxiety Sensitivity Index-3 (ASI-3) score=27) and 24 non-anxious comparisons (mean ASI-3 score=7) underwent fMRI scanning at 3-Tesla during modulation of cardiorespiratory threat signals via randomized double-blinded infusions of isoproterenol (2-micrograms) and saline.

Results: Despite having similar heart rate responses to isoproterenol ($p=0.37$, Cohen's $d=.19$), the anxious subjects reported significantly more anxiety ($p<0.05$, Cohen's $d=.55$) and divergent insular cortex responses during the anticipation and receipt of isoproterenol. Specifically, a voxelwise whole-brain analysis revealed that the high anxiety group (in comparison to the low anxiety group) exhibited heightened activity in the bilateral mid- and anterior-insula during anticipation of isoproterenol infusion ($p<0.001$ uncorrected, Cohen's $d=.54$), but blunted activity in the right mid-insula during actual receipt of isoproterenol ($p<0.001$ uncorrected, Cohen's $d=.67$).

Conclusions: This initial findings, from the first functional neuroimaging study exposing clinically anxious patients to cardiorespiratory interoceptive threat signals, suggest that neural circuits within the insular cortex are responsible for processing interoceptive threat.

Individual Abstract Number: 1256

Human Experimental Model of Inflammation-Induced Depression and Anxiety

Joshua H. Cho, MD, PhD, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at UCLA, Los Angeles, CA

Background: Inflammation is known to contribute to the development of depression, and recent evidence also supports such link for anxiety. However, human experimental evidence has been limited regarding the involvement of systemic inflammation in the induction and depressive and anxiety symptoms.

Methods: We conducted two randomized placebo-controlled studies of low-dose intravenous endotoxin (0.8 ng/kg of body weight) for the induction of depressive and anxiety symptoms in healthy volunteers (115 younger adults and 62 older females). Self-reported depressed mood and tension/anxiety were repeatedly assessed over 6 hours using the Profile of Mood States (POMS). Circulating proinflammatory cytokines, interleukin-6 and tumor necrosis factor- α , were also repeatedly measured over 6 hours.

Results: In younger adults, compared to placebo, endotoxin robustly increased depressive symptoms ($X^2=29.82$, $df=6$, $p<0.0001$) and anxiety symptoms ($X^2=45.24$, $df=6$, $p<0.0001$). Adjustment for sickness symptoms slightly attenuated the effects of endotoxin on depressive ($X^2=15.95$, $df=6$, $p=0.01$) and anxiety symptoms ($X^2=17.73$, $df=6$, $p=0.007$). When stratified by sex, the effect of endotoxin on depressive symptoms was significant in younger females ($X^2=28.45$, $df=6$, $p=0.0001$) but not in younger males ($X^2=12.00$, $df=6$, $p=0.06$). The effect of endotoxin on anxiety symptoms was significant in younger females ($X^2=34.33$, $df=6$, $p<0.0001$) and also in younger males ($X^2=20.91$, $df=6$, $p=0.002$). Endotoxin robustly increased circulating cytokines equally in younger females and males ($p's<0.0001$). In a separate study of older females, endotoxin (vs. placebo) significantly increased depressive symptoms ($X^2=14.36$, $df=7$, $p=0.04$) and anxiety symptoms ($X^2=27.57$, $df=7$, $p=0.0003$). No major adverse effects were observed.

Conclusions: Inflammatory challenge with low-dose endotoxin as an acute physiological stress reproduced a transient development of depressive and anxiety symptoms in humans. This human experimental model was safely conducted not only in younger but also in older adults. Furthermore, the experimental induction of these symptoms was independent of the experience of sickness symptoms.

Symposium 1334

Observing negative emotions through the lens of heart rate variability

Thursday, March 12 from 4:15 to 5:30 pm

OBSERVING NEGATIVE EMOTIONS THROUGH THE LENS OF HEART RATE VARIABILITY

Cristina Ottaviani, PhD, Psychology, Sapienza University of Rome, Rome, NA, Italy, Luca Carnevali, PhD, Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, NA, Italy, Nicola Petrocchi, PhD, PsyD, John Cabot University, Rome, NA, Italy, DeWayne P. Williams, PhD, Department of Psychological Science, University of California, Irvine, Irvine, CA, Sarah N. Garfinkel, PhD, Psychiatry, University of Sussex, Falmer, NA, United Kingdom, Hugo D. Critchley, MBChB, DPhil, FRCPsych, Psychiatry, University of Sussex, Falmer, NA, United Kingdom

Negative emotions, such as those induced by stressful experiences, can be transmitted among individuals through social interactions. The process in which one simply “catches” another person’s emotion and produces similar affective responses that result directly from the observation has been defined as emotional contagion and is considered a simple form of empathy. This notion is hardly new, yet little is known about the physiological concomitants of emotional contagion. Recent studies have started to investigate whether the “resonance” of stress-induced negative emotions across individuals may also affect physiological phenomena such as heart rate variability (HRV), a surrogate measure of autonomic function that has been linked to self-regulatory mechanisms. Understanding this physiological resonance of stress may be a key aspect to understand how the daily environment, without being traumatic, can impact our health and wellbeing. A potential way to circumvent the adverse effects of such “contagious” stress may lie in the practice of compassion. Indeed, research has shown that compassion to others or ourselves protects emotional wellbeing against stressful events in daily life. A proposed mechanism through which compassionate individuals are able to adapt to stressful events with more flexibility involves increased HRV. For example, high HRV has been found to play a protective role against the maladaptive consequences of racial discrimination in African American. On the other hand, a growing number of evidences suggests that HRV is reduced in several psychopathological conditions, and this is associated with impairments in such ability to resonate with others. This symposium will incorporate both preclinical and clinical studies which have adopted HRV measures to investigate the autonomic concomitants of negative emotional contagion and compassion in healthy individuals, taking into account the moderating role of social identity and psychopathological symptoms. Overall, the present symposium suggests that the study of autonomic function through HRV may increase knowledge about the mechanisms implicated in our capability to understand and cope with the emotions of others without affecting our health and wellbeing.

Individual Abstract Number: 1348

Autonomic correlates of social stress transmission in rodents

Luca Carnevali, PhD, Andrea Sgoifo, PhD, Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, NA, Italy

In humans, stressful experiences can be transmitted among individuals through social interactions. Such contagious stress transcends subjective feeling states to affect the individual’s behavior and physiology beyond the daily stressors experienced firsthand. Like humans, rodents are social creatures whose behavior and physiology can be influenced by the emotional state of fellow rodents. In this study, we describe an experimental rat model of social stress contagion and its effects on social behavior and cardiac autonomic and neuroendocrine functions. Adult male Wistar rats were pair-housed and one animal (designated as “demonstrator” (DEM)) was submitted to either social defeat stress (STR) by an aggressive male Wild-type rat in a separate room or just exposed to an unfamiliar empty cage (control condition, CTR), once a day for 4 consecutive days. We evaluated the influence of cohabitation with a STR DEM on behavioral, cardiac autonomic and neuroendocrine outcomes in the

cagemate (defined “observer” (OBS)). After repeated social stress, STR DEM rats showed clear signs of social avoidance when tested in a new social setting. Interestingly, also their cagemate STR OBSs showed higher levels of social avoidance compared to CTR OBSs. Moreover, STR OBS rats exhibited a higher heart rate and a larger shift of cardiac autonomic balance toward sympathetic prevalence (as indexed by heart rate variability analysis) immediately after the first reunification with their STR DEMs, compared to the control condition. Finally, STR OBSs showed elevated plasma corticosterone levels compared to CTR OBSs. These findings demonstrate that cohabitation with a DEM rat, which has experienced repeated social defeat stress, substantially disrupts social behavior and induces cardiac autonomic activation and hypothalamic-pituitary-adrenal axis hyperactivity in the OBS rat, thus suggesting emotional state-matching between the OBS and the DEM rats. This rodent model may be further exploited for investigating the neurobiological bases of negative affective sharing between social partners under chronic social stress conditions.

Individual Abstract Number: 1358

The compassionate vagus: A meta-analysis on the connection between compassion and vagally-mediated heart rate variability

Nicola Petrocchi, PhD, PsyD, John Cabot University, Rome, NA, Italy, Maria Di Bello, Master, Psychology, Sapienza University of Rome, Rome, NA, Italy, Luca Carnevali, PhD, Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, NA, Italy, Julian F. Thayer, PhD, Psychological Science, University of California, Irvine, Irvine, CA, Paul Gilbert, PhD, Health and Social Care Research Centre, University of Derby, Derby, NA, United Kingdom, Cristina Ottaviani, PhD, PsyD, Psychology, Sapienza University of Rome, Rome, NA, Italy

In recent years, increasing interest has been devoted to the physiological basis of self- and other-oriented compassion. Vagally-mediated heart rate variability (vmHRV) represents a promising surrogate marker, given its capacity to reflect soothing emotions and context appropriate prefrontal inhibitory control over the defensive response. The aim of this study was to meta-analyze available studies on the association between compassion and vmHRV. Random-effect models were used. The analysis performed on sixteen studies that met inclusion criteria yielded a significant association that was medium in size ($g = .54$ 95% CI [.24, .84], $p < .0001$). Results were not influenced by publication bias. The role of age, sex, cultural influences, study design, type of vmHRV/compassion measure, length of vmHRV assessment, and methodological quality as potential moderators was examined. After an extreme outlier's exclusion, the size of the association was still larger in studies that used time- or frequency-domain indexes of vmHRV compared to those that used respiratory sinus arrhythmia. Results are limited by the small number of studies included in the meta-analysis and are discussed in terms of future indications, given that existing data are highly heterogeneous and of scarce methodological rigor.

Individual Abstract Number: 1513

Resting Heart Rate Variability Moderates the Association between Racial Identification and Social Dominance Orientation in European Americans

DeWayne P. Williams, PhD, Department of Psychological Science, University of California, Irvine, Irvine, CA, Nicholas P. Joseph, M.A., Psychology, The Ohio State University, Columbus, OH, Gewnhi Park, PhD, Psychology, Hope University, Holland, MI, LaBarron K. Hill, PhD, Psychiatry & Behavioral Sciences, School of Medicine, Duke University, Durham, NC, Jay J. Van Bavel, PhD, Psychology, New York University, New York, NY, Julian F. Thayer, PhD, Department of Psychological Science, University of California, Irvine, Irvine, CA

Evidence links discrimination with poorer psychophysiological functioning and health among minority groups (e.g., African Americans | AAs). However, little research has examined the psychophysiological profile of majority individuals in America (e.g., European Americans | EAs) most likely to support and engage in negative discriminatory behaviors towards minority groups. Research

has shown individuals higher in social dominance orientation (SDO), or the degree to which individuals desire and support group-based hierarchies, are more likely to discriminate against minority groups. Moreover, individuals higher in RI are racial identity (RI), reflecting the degree to which individuals identify with their own racial group, may be more likely to exhibit higher SDO. Interestingly, previous research has shown that when individuals make social-hierarchy judgements, prefrontal brain activation occurs. Resting heart rate variability (HRV) is an index of prefrontal activity and thereby serves as an index of inhibitory control. The present study examined the potential moderating effect of resting HRV on the relation between RI and SDO. Ninety-eight individuals (47 EAs, 51 AAs) completed a 5-minute baseline period where resting HRV (root mean of squared successive difference | RMSSD) was assessed. Participants also completed both the RI and the SDO scales. Controlling for sex, age, and body mass index, resting HRV moderated the association between RI and SDO in EAs ($\Delta R^2 = .154$, $B = -.76$ (.27), [.03, .78], $p = .008$). EAs with lower resting HRV showed a significant positive association between RI and SDO ($B = .41$ (.19), [.03, .78], $p = .035$), whereas EAs with higher resting HRV showed a significant negative association between RI and SDO scores ($B = -.45$ (.21), [-.87, -.03], $p = .037$). No such moderation was found in AAs ($\Delta R^2 = .006$, $B = -.28$ (.53), [-1.35, 0.79], $p = .778$). These data suggest that greater resting HRV may be necessary to inhibit potential negative and harmful discriminatory behaviors as a result of SDO in the real-world. Additional implications and future directions will be discussed.

Individual Abstract Number: 1621

Altered HRV in clinical disorders and links to affective style

Sarah N. Garfinkel, PhD, Psychiatry, University of Sussex, Falmer, NA, United Kingdom, Donna L. Ewing, PhD, Psychology, University of Brighton, Brighton, NA, United Kingdom, Cassandra Gould van Praag, PhD, Psychiatry, University of Oxford, Oxford, NA, United Kingdom, Francis Meeten, PhD, Psychology, Hugo D. Critchley, MBChB, DPhil, FRCPsych, Psychiatry, University of Sussex, Falmer, NA, United Kingdom

Heart-rate variability has been shown to be altered in different clinical conditions and has also been linked to individual differences in affect. In a cross-sectional study, 306 patients were sequentially recruited when accessing secondary mental health care (through Sussex Partnership NHS Foundation Trust). Healthy controls ($N=67$) were recruited from the local community. Patients differed from controls in HRV (patients vs controls; RMSSD ms2 mean \pm sd: 51.6 ± 42.6 vs 70.19 ± 58.4 , [$F(1,341) = 8.8$, $p=0.003$]). There was also significant variation between different clinical diagnoses in RMSSD [$F(6, 234)=3.1$, $p=0.006$], with greatest reductions observed in individuals with bipolar disorder, emotionally unstable personality disorder, schizoaffective disorder and schizophrenia. Cross diagnostically, HRV (RMSSD) was not related to global variations in positive and negative affect, though differences where observed within diagnoses. These data suggest that diagnosis dominates over affective style when investigating RMSSD differences between individuals.

Symposium 1349

Novel developments in pain-related fear, avoidance, and memory biases and their role in chronic pain disability

Thursday, March 12 from 11:45 am to 12:45 pm

NOVEL DEVELOPMENTS IN PAIN-RELATED FEAR, AVOIDANCE, AND MEMORY BIASES AND THEIR ROLE IN CHRONIC PAIN DISABILITY

Ann Meulders, PhD, Experimental Health Psychology, Maastricht University, Maastricht Netherlands, Ann Meulders, PhD, Experimental Health Psychology, Maastricht University, Maastricht, Netherlands, Angelos Kryptos, PhD, Health Psychology, KU Leuven, Leuven, NA, Belgium, Melanie Noel, PhD, Psychology, University of Calgary, Calgary, Canada

Learning to predict danger is adaptive; it assists in anticipating and avoiding harm. Given its intrinsically alarming function, pain is a potent motivator for learning –it stimulates the detection of stimuli predicting the occurrence of pain to minimize their impact. Protective responses (fear/avoidance) are adaptive and promote recovery, yet when pain no longer signals bodily harm they may derail into chronic pain. Prominent chronic pain models assign a key role to learning and memory processes in the development and maintenance of pain-related disability.

This symposium brings together cutting-edge research on how fear/avoidance learning processes and biased memories for pain contribute to pain responses, pain persistence, and pain-related disability and how these processes can be targeted in treatment. Because pain-related fear/avoidance are clinical hallmark symptoms of chronic pain, treatments have targeted fear and catastrophic beliefs about pain to tackle chronic pain disability. Avoidance behavior hampers fear extinction (protection from extinction), therefore using response prevention with extinction protocols, i.e. prohibiting avoidance, is standard practice in clinical treatment. Moreover, interventions to minimize memory biases, which are driven by fear and which influence future pain, hold promise for preventing pain problems in the first place.

Three speakers from different labs will present innovative research on this topic. The first speaker will present new data using an operant avoidance learning paradigm showing that the unavailability of avoidance may constitute a context switch impeding the transfer of corrective learning from the therapy context to the patient's daily life and leading to return of avoidance (clinical relapse). The second speaker will discuss how persistent avoidance can be viewed as a bias towards exploitation in the framework of the explore-exploit dilemma in the context of pain, using a computational modeling approach. Finally, our last speaker will present research showing that fear/anxiety are powerful predictors of memory biases, and in children, parental anxiety in particular plays a critical role in collective pain memory (re)construction. Further, a psychological intervention aimed at facilitating more accurate/positive pain memories and subsequently, less future pain, distress and avoidance will be discussed.

Individual Abstract Number: 1447

To Avoid or Not to Avoid: Safety Behaviors and Avoidance Maintain Threat Beliefs and Pain-related Fear

Ann Meulders, PhD, Experimental Health Psychology, Maastricht University, Maastricht, Netherlands

Pain is a motivational state that urges us to take action and restore bodily integrity. Learning to predict harm enables us to initiate defensive responses including increased arousal, self-reported fear, but also recuperative avoidance and safety-seeking behaviors. These protective behaviors are adaptive in the acute pain stage, but when they persist after normal healing time, they may foster disability. Pain-related fear conditioning research has focused on passive fear correlates (arousal and verbal reports) largely ignoring active behavioral avoidance. However, fear and avoidance mutually affect each other. For example, allowing avoidance behavior during exposure may hamper corrective learning because the non-occurrence of the

feared event is misattributed to the avoidance response (*protection from extinction*). Therefore, exposure protocols often imply *response prevention with extinction*, that is, avoidance and safety behaviors are prohibited. This technique however may shift the problem because the unavailability of the avoidance response may constitute a context-switch (from therapy context to the patient's daily life) impeding the transfer of corrective learning and leading to return of avoidance or *renewal* (return of fear due to context-switch). I will present new data demonstrating these learning principles using classical and operant conditioning paradigms and discuss their implications for the treatment of chronic pain.

Individual Abstract Number: 1449

The exploration-exploitation dilemma in pain

Angelos Kryptos, PhD, Health Psychology, KU Leuven, Leuven, NA, Belgium

Everyday life operates as a chain of decisions, where individuals have to choose between alternative options. In such situations, an individual may choose based on what s/he already knows (*exploitation*), or search for alternative options (*exploration*). Across two experiments, we tested for the first time the exploration-exploitation dilemma when individuals have to avoid painful stimuli and/or approach rewarding cues. Specifically, individuals completed a 4-bandit task, where they had to choose with a joystick, one of four squares, with each square being associated with different probabilities of receiving a painful shock and/or receiving a momentary reward. Our statistical analyses involved the use of different reinforcement models that emphasize the integration of information in terms of punishments (i.e., the administration of the painful stimulus) and/or rewards (i.e., the momentary rewards) learning rates, as well as the sensitivity to rewards or punishment (i.e., how much someone expects to like not receiving a painful stimulus or dislikes receiving a painful stimulus). In both experiments results showed that individuals learned faster to switch their choices after receiving a painful stimulus and/or missing a reward but were slower in learning about the choices that were a reward. In real life, these results imply that in a context where individuals have to avoid an aversive event, are faster in learning to avoid harmful actions than choosing rewarding options. At the same time, participants weighted the receiving of rewards more heavily than avoiding the painful stimuli. This means that individuals' choices were mostly driven by liking receiving a reward than disliking receiving a painful stimulus. These results could encourage the further use of rewards in clinical interventions for chronic pain. The idea of reward inclusion in pain intervention is also in line with the motivation account of chronic pain recently suggested in the literature. All in all, the deeper understanding of the exploration-exploitation dilemma may be helpful in understanding decision making in the context of pain, an issue of tremendous importance for individuals and the society.

Individual Abstract Number: 1448

A Cognitive Underpinning of Pain Avoidance: Memory for Pain

Melanie Noel, PhD, Psychology, University of Calgary, Calgary, Canada

Memory for pain is a robust predictor of future pain experience. Pain memories are highly malleable and have long lasting effects. Individuals who develop negatively biased memories of pain (recall higher pain than initial report) experience more future pain and fear. Negative pain memories from childhood are predictive of fears and avoidance of medical care into adulthood. Pain memory also underlies the development of chronic pain. Adolescents who developed negatively biased memories of post-surgical pain were more likely to report higher levels of pain at 4 months, precisely when pain can transition from to a chronic state. Given the importance of pain memories in pain and health trajectories across the lifespan, research has attempted to identify why some individuals are at risk for developing biases in recall. This research has revealed that anxiety and fear are the two most powerful predictors of pain memory bias, and particularly in the context of childhood, *parental* anxiety plays the most important role. Our work has also examined the social context of

memory development, specifically, how pain memories are collectively constructed and reconstructed through language-based interactions (parent-child reminiscing). We discovered that parents do not talk in adaptive ways with children about pain versus other negative emotional events, suggesting potential avoidance of recounting/processing painful experiences. Based on this observational work, we developed the first parent-led memory reframing intervention to determine if we can foster more accurate/positive pain memories and subsequently, less future pain, distress and avoidance. Finally, we examine more pathological forms of memory—reexperiencing in PTSD—and its high co-occurrence with chronic pain in youth and parents. Core to the experience of trauma is avoidance. We conduct translational studies to determine the cognitive-behavioral, social, and neurobiological mechanisms underlying the PTSD-pain relationship and the intergenerational transmission of chronic pain through early traumatic experiences in childhood.

Symposium 1364

Culturally-Centered Approaches to Addressing Health Inequities in American Indian/ Alaskan Natives

Friday, March 13 from 2:45 to 4:00 pm

CULTURALLY-CENTERED APPROACHES TO ADDRESSING HEALTH INEQUITIES IN AMERICAN INDIAN/ ALASKAN NATIVES

Wendy M. Troxel, PhD, Behavior and Policy Sciences, RAND Corporation, Pittsburgh, PA, Daniel Dickerson, D.O., Integrated Substance Abuse Programs, UCLA, Los Angeles, CA, Carrie Johnson, PhD, Mental and Behavioral Health, Sacred Path Indigenous Wellness Center, San Dimas, CA, Wendy M. Troxel, PhD, Behavioral and Policy Sciences, RAND Corporation, Pittsburgh, PA, Claradina Soto, PhD, Keck School of Medicine, Preventive Medicine, University of Southern California, Los Angeles, CA

There is perhaps no other racial/ ethnic group that is more vulnerable to a host of negative health outcomes, ranging from obesity, to heart disease, to substance use, and suicide, than American Indians/ Alaska Natives (AI/ANs). For example, cardiovascular disease mortality rates are 20% higher in AI/ANs, and rates of substance use are also disproportionately higher among AI/ANs as compared to other racial/ethnic groups. Despite these striking health inequities, AI/ANs remain significantly under-represented in health research. Further, there is an acute need for culturally-centered and evidence-based prevention and intervention efforts in this highly vulnerable population. Our symposium brings together four different presentations, using a range of study designs and methodologies, including observational and intervention studies, as well as quantitative and qualitative data; all focused on key health outcomes in AI/ANs, including sleep, substance use, and cardiometabolic risk. The first presentation will present results from a randomized clinical trial, which utilizes a novel substance use treatment intervention for AI/ANs that incorporates AI/AN drumming as its core component of treatment. The second presentation will discuss qualitative data from a statewide, community-based needs assessment to identify facilitators and barriers to treatment of substance use disorders (SUD) and opioid use disorders (OUD) among AI/AN adult and youth and health care providers in California. The third presentation will present clinical trial data from a novel substance use prevention program integrating motivational interviewing with AI/AN traditional practices for urban AI/AN adolescents. The final presentation will present preliminary data from the first longitudinal study of the role of sleep in contributing to cardiometabolic and behavioral health problems in urban AI/AN youth. Cross-cutting themes of this symposium will include a focus on community-based participatory research and the importance of developing culturally-centered and multi-level interventions to target health disparities in a racial/ethnic group that faces unique sources of

stressors, both historically and currently, and that is under-represented in health research.

Individual Abstract Number: 1365

Integration of Drumming in Substance Use Treatment Intervention for American Indians/Alaska Natives

Daniel Dickerson, D.O., Integrated Substance Abuse Programs, UCLA, Los Angeles, CA, Carrie Johnson, PhD, Mental and Behavioral Health, Sacred Path Indigenous Wellness Center, San Dimas, CA, David Klein, M.S., Sociology and Statistics, Elizabeth J. D'Amico, PhD, Behavior and Policy Sciences, RAND Corporation, Santa Monica, CA

Substance use disproportionately affects American Indians/Alaska Natives (AI/ANs). One of the reasons for this health inequity is due to the shortage of evidence-based substance use interventions that have undergone rigorous research methodologies. AI/AN communities, elders, and providers emphasize the importance of integrating AI/AN traditional practices within substance use intervention programs in order to restore health in this population. Drum-Assisted Recovery Therapy for Native Americans (DARTNA) is a substance use treatment intervention for AI/ANs that incorporates AI/AN drumming as its core component of treatment. It integrates drumming with AI/AN cultural education and Wellbriety concepts. This presentation provides results from a recently conducted feasibility randomized clinical trial (RCT) analyzing the potential benefits of this intervention (n=61). Baseline data revealed that most participants reported alcohol as the most commonly used substance (63%), followed by marijuana (27%) and methamphetamine (23%). The majority of AI/AN adults in the study said that they participated in AI/AN traditional practices (68%), such as sweat lodge ceremonies and attending pow-wows. Most of the sample reported good health and mild levels of anxiety and depression. Seventy-seven percent of the sample completed their end of treatment survey and 62.3% completed their 3-month follow-up survey. Participants were randomized to DARTNA or education only. DARTNA participants attended a mean of 4.4 (73.8%) out of 6 sessions. Among those randomized to education only, participants attended a mean of 2.3 sessions (78.2%) out of 3 sessions. Overall, strategies need to be identified to recruit and retain AI/AN adults in RCTs within urban areas. We are currently analyzing outcomes to determine whether DARTNA participants report less alcohol and drug use, better physical and mental health, and greater spirituality. Based on a previous smaller trial of DARTNA, we believe that this program can benefit AI/ANs with substance use problems and provide culturally appropriate programming for this population.

Individual Abstract Number: 1372

Achieving Health Equity Through Development and Delivery of a Culturally Centered Program

Carrie Johnson, PhD, Mental and Behavioral Health, Sacred Path Indigenous Wellness Center, San Dimas, CA, Daniel Dickerson, D.O., Integrated Substance Abuse Programs, UCLA, Los Angeles, CA, Ryan Brown, PhD, Elizabeth J. D'Amico, PhD, Behavioral and Policy Sciences, RAND Corporation, Santa Monica, CA, Carrie Johnson, PhD, Mental and Behavioral Health, Sacred Path Indigenous Wellness Center, San Dimas, CA

Research has shown that American Indians/Alaska Natives (AI/ANs) tend to report higher rates of alcohol and other drug (AOD) use and problems. Although approximately 70% of AI/ANs reside in urban areas, few programs that integrate AI/AN traditional practices with evidence-based practices have been developed, implemented, and evaluated with urban AI/ANs using a strong research design. We utilized a community-based participatory research (CBPR) approach to design Motivational Interviewing and Culture for Urban Native American Youth (MICUNAY), a new substance use prevention program integrating motivational interviewing with AI/AN traditional practices. We recruited AI/AN adolescents in northern, central, and southern California in urban areas from 2014-2017 for a randomized controlled trial where we tested the added benefit of MICUNAY to a CWG (Community Wellness Gathering). The sample include 185 self-

identified AI/AN adolescents. The sample was 51% female, and the mean age was 15.6 years. Teens were randomized to MICUNAY+CWG or CWG only, and then completed a three and six month follow up. Overall, use rates remained stable over the course of the study, and we did not find significant differences between the groups on alcohol or drug use, spirituality, or cultural identification. Most MICUNAY group teens (57%) attended all three intervention sessions within 3 months, and 94 teens (92%) attended at least one session within 3 months. Overall, we were able to reach 76% for follow-up surveys at 3 months, and 82% at 6 months. Findings are encouraging given that adolescents typically increase their AOD use during this developmental timeframe. It may be that connecting urban AI/AN adolescents to culturally centered activities and resources is protective, which has been shown in other work with this population. Findings highlight the importance of working with community-based organizations to increase engagement, recruitment and retention of urban AI/AN adolescents in clinical trial research.

Individual Abstract Number: 1373

Psychosocial and Cultural Influences on Sleep Health in Urban American Indian/ Alaskan Native Adolescents: Preliminary Results from the NAYSHAW Study

Wendy M. Troxel, PhD, Behavioral and Policy Sciences, RAND Corporation, Pittsburgh, PA, Daniel Dickerson, D.O., Integrated Substance Abuse Program, UCLA, Los Angeles, CA, Ryan Brown, PhD, Behavioral and Policy Sciences, Michael Woodward, BA, Behavior and Policy Sciences, RAND Corporation, Santa Monica, CA, Carrie Johnson, PhD, Mental and Behavioral Health, Sacred Path Indigenous Wellness Center, San Dimas, CA, David Klein, MS, Sociology and Statistics, Jennifer Parker, BA, SRG, Elizabeth J. D'Amico, PhD, Behavior and Policy Sciences, RAND Corporation, Santa Monica, CA

American Indian/ Alaskan Natives (AI/ ANs) are one of the most at-risk racial/ethnic groups in the United States for adverse health outcomes. Poor sleep health may contribute to health inequities, but AI/ANs are rarely represented in sleep research. The scant research on sleep in AI/ANs have primarily focused on adults and those living on reservations. However, adolescence is a critical developmental period for the development of sleep problems and health disparities. Urban AI/ANs represent a highly disenfranchised and marginalized population who may be at increased risk for poor sleep health. The Native American Youth, Sleep, Health and Wellness (NAYSHAW) Project is the first project to incorporate longitudinal assessments of objectively and subjectively measured sleep, surveys of psychosocial and cultural risk factors, and cardiometabolic markers in a sample of urban AI/AN youth. The current study presents preliminary findings on multi-level influences on sleep health. We examined actigraphy-assessed sleep duration, efficiency, wakefulness after sleep onset (WASO), and social jetlag, and self-reported sleep quality. Survey assessments of individual (depression and anxiety), family (conflict and cohesion), neighborhood (safety and cohesion), and cultural factors (discrimination, AI/AN cultural identity) were examined as potential risk factors for objective and subjective sleep disturbances. Participants are on average 14 years at baseline (66% female). Sleep duration, on average, was 6.8 hours. Average sleep efficiency and WASO were 79.3% and 80.67 minutes. Average social jetlag was 80.25 minutes (SD=44.90). Depressive and anxiety symptoms were associated with subjectively reported poor sleep health, and anxiety was also associated with shorter WASO. Higher family conflict and lower family cohesion were associated with subjectively poor sleep health, but not with actigraphy sleep outcomes. Greater AI/AN cultural identity was associated with a lower likelihood of social jetlag. Discrimination was associated with poorer subjective sleep health. Higher neighborhood safety and cohesion were associated with better subjectively reported sleep health. These preliminary results demonstrate several indicators of poor sleep health in this population and highlight the importance of considering multi-level influences on AI/AN sleep.

Individual Abstract Number: 1389

Statewide Collaborative Partnerships Among American Indian and Alaska Native (AI/AN) Communities in California to Target the Opioid Epidemic

Claradina Soto, PhD, Keck School of Medicine, Preventive Medicine, University of Southern California, Los Angeles, CA

American Indian and Alaska Native (AI/AN) communities have disproportionately been impacted by the opioid epidemic with the second highest opioid-related overdose death rates compared to other ethnic groups. The diversity among California (CA) AI/AN Tribes, including regional differences in economic opportunities, Tribal affiliation and organization, resources and infrastructure, requires a strong community-based partnership approach to assess statewide patterns in service availability, acceptability, and utilization, as well as capturing the unique challenges and service needs within each region. A CA statewide community-based needs assessment of strengths and weakness among AI/AN adult and youth and health care providers was administered to identify facilitators and barriers to treatment of substance use disorders (SUD) and opioid use disorders (OUD). Forty key informant interviews (KII) with healthcare professionals from Urban Indian Health Programs, Tribal clinics and community-based organizations were conducted. Ten youth and 19 adult focus groups from Tribal and urban areas were facilitated. The KIIs and focus groups assessed (1) barriers accessing services; (2) risk factors; (3) protective factors; (4) community substance use description; (5) SUD and OUD services available; and (6) service system needs. Findings indicate an overall increase in SUD and OUD in AI/AN communities. Key informants discussed the importance of comprehensive and culturally centered care, wrap-around services, such as treatment of mental health issues alongside substance abuse, and the need for AI/AN-specific treatment facilities that integrate traditional and cultural activities into western health services. Youth discussed the importance of role models, engagement with their community and a positive social network as preventive factors. Adults discussed the negative consequences of SUD on their communities, the importance of family and sense of belonging as protective factors against SUD. There is a need for the engagement of community members as key stakeholders to build a culturally congruent, comprehensive, and collaborative system of care model to prevent and treat substance abuse in AI/AN communities.

Symposium 1375

Asthma: Central Nervous System, Cognitive, and Emotional Sequelae and Their Implications for Disease Management

Friday, March 13 from 10:45 am to 12:00 pm

ASTHMA: CENTRAL NERVOUS SYSTEM, COGNITIVE, AND EMOTIONAL SEQUELAE AND THEIR IMPLICATIONS FOR DISEASE MANAGEMENT

Jonathan Feldman, Ph.D., Ferkauf Graduate School of Psychology, Yeshiva University/Albert Einstein College of Medicine, Bronx, NY, Thomas Ritz, Ph.D., Psychology, Southern Methodist University, Dallas, TX, Melissa A. Rosenkranz, PhD, Psychiatry, University of Wisconsin-Madison, Madison, WI, Jacqueline H. Becker, Ph.D., General Internal Medicine, Icahn School Of Medicine at Mount Sinai, New York, NY, Jonathan Feldman, Ph.D., Ferkauf Graduate School of Psychology, Yeshiva University/Albert Einstein College of Medicine, Bronx, NY, Hannah Nordberg, B.A., Psychology, Southern Methodist University, Dallas, TX, Paul Lehrer, Ph.D., Psychiatry, Rutgers Robert Wood Johnson Medical School, Piscataway, NJ

Asthma has long been viewed as a disease affecting the airways, which has consequences for daily functioning and quality of life. In recent years, attention has been directed towards other illness sequelae, such as changes in central nervous system (CNS) structure and function, or cognitive and emotional functioning, as mediators of suboptimal disease management. This symposium will bring together recent

findings from studies that have utilized a range of neuroimaging modalities (diffusion tensor imaging, neurite orientation and dispersion density imaging, magnetic resonance spectroscopy), cognitive and emotional assessments, and self-management indicators, including asthma symptom perception, in varying asthma populations. Studies have shown that peripheral disease processes of the airways in asthma are linked to compromise in CNS white matter microstructure and associated cognitive impairments and depression. Metabolites as indicators of compromised neuronal viability in the hippocampus, a key structure for cognitive and emotional processes, have also been linked to greater emotional reactivity to stressful stimuli. Older patients with chronic asthma may be particularly vulnerable to cognitive impairment, which is associated with deficits in adequate disease control and quality of life. Psychopathology, such as depression, can further complicate disease self-management with over-perception of asthma symptoms and overuse of rescue medications. It is hoped that these findings will contribute to a better understanding of the ways through which asthma self-management impacts, and is impacted by, cognitive and emotional functioning. They can stimulate further research efforts to elucidate the intricate relationship between peripheral airway disease and CNS processes in this chronic disease, and thus contribute to a better understanding and removal of barriers to successful disease management.

Individual Abstract Number: 1424

Compromised White Matter Microstructure and Cognitive Performance in Asthma

Melissa A. Rosenkranz, PhD, Psychiatry, Doug C. Dean III, PhD, Pediatrics, Stephane Esnault, PhD, Medicine, University of Wisconsin-Madison, Madison, WI, Michael D. Evans, M.S., Clinical and Translational Science Institute, University of Minnesota, Minneapolis, MN, Richard J. Davidson, PhD, Psychology & Psychiatry, William W. Busse, MD, Medicine, University of Wisconsin-Madison, Madison, WI

Asthma affects nearly 10% of the U.S. population and, for most, begins in childhood and lasts a lifetime. Asthma is characterized by airway inflammation, but new data indicate that systemic manifestations of this underlying inflammation occur and may affect organs other than the lungs, including the brain. Our previous work demonstrated that acute airway inflammation impacts neural circuits that process emotional information. Further, patients with asthma have a two-fold higher risk for mood and anxiety disorders, which are associated with poor asthma control, an increased frequency of symptoms and greater health care utilization — all reflecting uncontrolled airway inflammation. Importantly, the impact of asthma on the brain may not be limited to function but also may include structure. Recent population-based studies have found an increased risk for dementia in asthma that is further amplified in patients with a greater frequency and severity of asthma exacerbations, thus implicating structural changes in the brain. To address the hypothesis that asthma is associated with brain structural changes, we examined brain white matter microstructure for evidence of neurodegeneration in 111 individuals with asthma, ranging in disease severity from mild to severe, compared to 135 healthy, non-asthmatic controls. Diffusion Tensor Imaging (DTI) and Neurite Orientation and Dispersion Density Imaging (NODDI) were used to assess white matter microstructure. After controlling for variance accounted for by age and sex, asthmatic subjects showed widespread differences in several DTI and NODDI measures, which are indicative of neurodegenerative processes. Further, objective measures of asthma severity and self-reported depressive symptoms were associated with deleterious changes in white matter microstructure. Finally, in tract-based analyses, cognitive performance was related to mean white matter microstructure in several different tracts. These data suggest that asthma may be a risk factor for neurodegenerative diseases such as AD and other forms of dementia. These observations also suggest that optimal management to control underlying airway inflammation may be a treatment strategy to reduce asthma-associated risks for neurodegeneration.

Individual Abstract Number: 1773

Anxiety and Disgust Reactivity in Asthma: The Role of Hippocampal Volume and Hippocampal Metabolite Levels

Hannah Nordberg, B.A., Juliet Kroll, M.A., Psychology, Southern Methodist University, Dallas, TX, Sina Aslan, Ph.D., Psychiatry, The University of Texas Southwestern Medical Center, Dallas, TX, David Rosenfield, Ph.D., Psychology, Southern Methodist University, Dallas, TX, Dave A. Khan, Ph.D., Internal Medicine, Changho Choi, Ph.D., Advanced Imaging Research Center / Radiology, E. Sherwood Brown, Ph.D., Psychiatry, The University of Texas Southwestern Medical Center, Dallas, TX, Thomas Ritz, Ph.D., Psychology, Southern Methodist University, Dallas, TX

Background: Emerging research suggests an association between asthma and decreased cognitive function. The association of asthma with individuals' neuronal health, however, has been largely understudied. The hippocampus is a critical structure implicated in cognitive and affective functioning. Although individuals with asthma experience anxiety disorders at increased rates, effects of the interaction of asthma with hippocampal structure/chemistry on individuals' affect has not been previously examined. In the present study, we sought to investigate the association of asthma, hippocampal volume and hippocampal metabolite levels on individuals' affective reactivity. **Method:** Adults with asthma ($N = 20$) and healthy controls ($N = 20$) participated in the study. Left hippocampal metabolite concentrations (N-acetylaspartate (NAA), glutamate (Glu), glutamine (Gln), myo-inositol (mI), total creatine (tCr), and total choline (tCho)) were obtained using magnetic resonance spectroscopy and left hippocampal volume was obtained with 3T structural Magnetic Resonance Imaging. Participants viewed two blocks of negative film clips and one block of neutral film clips. Ratings of their anxiety and disgust levels were obtained at baseline and after each block of films. Multilevel modeling controlling for age, gender, and inhaled corticosteroid use was used to examine factors associated with individuals' anxiety and disgust reactivity to the films. **Results:** Hippocampal volume was not associated with individuals' affective responses to the films. Two out of six hippocampal metabolites, tCr and tCho, were associated with individuals' anxiety response to negative films. Lower tCr and tCho levels were associated with a stronger anxiety response to negative compared to neutral films in asthma but not healthy controls. For tCr, disgust responses to negative films increased with lower tCr levels for both groups. In general, asthmatics had significantly greater anxiety and disgust responses to negative films. **Conclusion:** Hippocampal chemistry appears to modulate the affective responding in asthma specifically. Our findings reflect earlier reports of an association between low tCr or tCho and psychopathology and may indicate problematic interactions of asthmatic disease processes with neuronal health that are already visible in young to middle aged patient populations.

Individual Abstract Number: 1420

Cognitive functioning and self-management behaviors among older adults with asthma

Jacqueline H. Becker, Ph.D., Arushi Arora, MPH, General Internal Medicine, Geoffrey G. Tilocca, MA, Department of General Internal Medicine, Michele Barry, MS, General Internal Medicine, Paula J. Busse, MD, Department of Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, Jonathan Feldman, PhD, Ferkauf Graduate School of Psychology, Yeshiva University/Albert Einstein College of Medicine, Bronx, NY, Juan Wisnivesky, MD, General Internal Medicine/Pulmonary, Critical Care and Sleep Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, Alex Federman, MD, General Internal Medicine, Icahn School of Medicine at Mount Sinai, New York, NY

Background: Cognitive impairment (CI) is highly prevalent in older adults with asthma and is associated with worse asthma outcomes. Deficits exist specifically in aspects of executive functioning (EF), a set of abilities essential to self-management behaviors (SMB), which may impair asthma symptom perception (ASP). We hypothesized that

impaired aspects of EF would be associated with poor SMB, under-perception of asthma symptoms, and worse medication adherence.

Methods: Interim analyses were conducted on baseline measures from a longitudinal cohort study of ASP among patients with asthma ages ≥ 60 years ($n=175$). ASP was assessed with a computerized peak expiratory flow (PEF) monitor by comparing estimated and actual PEF. Percentage of time subjects performed in the under-perception zone was calculated as an average. Measures of SMB were self-reported adherence to inhaled corticosteroids (ICS) and electronically measured use of rescue inhalers. Measures of disease control included the Asthma Control Questionnaire and the Asthma Quality of Life Questionnaire. Measures of EF included Trail Making Test (A&B), Pattern Comparisons, and Letter-Number Sequencing. General cognition was measured by the MoCA. We calculated Spearman correlation coefficients for the associations between cognitive measures, SMB, and ASP.

Results: Mean age was 68 ($SD=7$), 82% were female, and 39% and 27% were Hispanic and non-Hispanic black, respectively. Deficient aspects of EF (i.e., set-shifting & working memory) were correlated with worse asthma control ($r=.20$ & $-.18$, respectively; $p<.05$) and worse quality of life ($r=-.25$ & $.23$, respectively; $p<.05$). Other EF deficits (Trails A) were correlated with greater rescue inhaler use ($r=.30$, $p<.01$). Deficits in general cognition were correlated with greater rescue inhaler use ($r=-.33$, $p<.001$), worse asthma control ($r=-.24$, $p<.01$), and worse quality of life ($r=-.26$, $p<.001$). ICS adherence and symptom under-perception were not associated with any variables.

Discussion The results confirmed that impairments in EF and general cognition are associated with worse asthma control and worse quality of life. While this suggests that CI plays an important role in asthma control, these findings were not linked to asthma symptom perception or ICS adherence. Future analyses are needed to understand the role of confounding factors.

Individual Abstract Number: 1391

Asthma symptom perception, depressive symptoms, and self-management behaviors among older adults with asthma

Jonathan Feldman, Ph.D., Ferkauf Graduate School of Psychology, Yeshiva University/Albert Einstein College of Medicine, Bronx, NY, Jacqueline Becker, Ph.D., Arushi Arora, MPH, General Internal Medicine, Icahn School Of Medicine at Mount Sinai, New York, NY, Erika Groban, Ph.D., Jesenya DeLeon, M.A., Tatiana Torres Hernandez, B.S., Pediatrics, Albert Einstein College of Medicine, Bronx, NY, Sunit Jariwala, M.D., Medicine, Division of Allergy/Immunology, Albert Einstein College of Medicine/Montefiore Medical Center, Bronx, NY, Chang Shim, M.D., Medicine (Pulmonary Medicine), Jacobi Medical Center/Albert Einstein College of Medicine, Bronx, NY, Alex Federman, M.D., General Internal Medicine, Juan Wisnivesky, M.D., General Internal Medicine/Pulmonary, Critical Care and Sleep Medicine, Icahn School Of Medicine at Mount Sinai, New York, NY

Background: Asthma symptom perception (ASP), central to effective disease control, may be inadequate in older adults with asthma. Inaccurate ASP is linked with negative emotions, poor self-management behavior (SMB), and greater asthma morbidity. Depression can lead to over-perception via hypervigilance to somatic sensations, increased sensitivity to internal cues, and catastrophizing. Depression is associated with worse asthma outcomes. We hypothesized that depressive symptoms would be associated with over-perception of asthma symptoms and worse SMB.

Methods: Cross-sectional baseline data were from a longitudinal cohort study of ASP among older adults with asthma ages ≥ 60 years in East Harlem and the Bronx, NY ($N=175$). ASP was assessed using a programmable peak expiratory flow (PEF) monitor for 6 weeks following baseline. ASP accuracy was determined by comparison of each participant's estimated and actual PEF using the validated Asthma Risk Grid. Percentage of time that subjects performed in the over-perception zone was calculated as an average. Measures of SMB included self-report on the Medication Adherence Rating Scale and

electronically measured use of rescue inhalers over 1 month following baseline. Depression was assessed with the Geriatric Depression Scale. Measures of disease control included the Asthma Control Questionnaire and the Asthma Quality of Life Questionnaire. Interim analyses were conducted using Spearman correlation coefficients to assess correlations between variables.

Results: Mean age was 68 years ($SD=7$), 82% were female, and 39% and 27% were Hispanic and non-Hispanic black, respectively. 24% had clinical depression and 15% of the time participants were over-perceiving. Depressive symptoms were correlated with over-perception of asthma symptoms ($r=0.15$, $p<.05$), worse asthma control ($r=0.22$, $p<.01$), and lower quality of life ($r=-0.35$, $p<.0001$). Over-perception was associated with greater use of rescue inhalers ($r=0.20$, $p<.05$), and worse asthma control ($r=0.25$, $p<.001$), quality of life ($r=-0.18$, $p<.05$), and self-reported medication adherence ($r=-0.21$, $p<.05$).

Discussion: Depressive symptoms were associated with over-perception of asthma symptoms and worse asthma control among older adults with asthma. Over-perception of asthma symptoms may play a key role in the relationship between depression and asthma control.

Symposium 1427

#MeToo, Sexual Trauma, and Women's Cardiovascular Health Across the Lifespan

Friday, March 13 from 1:30 to 2:30 pm

#METOO, SEXUAL TRAUMA, AND WOMEN'S CARDIOVASCULAR HEALTH ACROSS THE LIFESPAN

Rebecca C. Thurston, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Karen P. Jakubowski, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Karen P. Jakubowski, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Rebecca C. Thurston, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Carolyn J. Gibson, PhD, MPH, Psychiatry, University of California, San Francisco, San Francisco, CA, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Sexual trauma, including sexual assault and sexual coercion, is prevalent in US women. For example, 36% of women report a lifetime history of sexual assault and 1 in 6 women report exposure to contact sexual violence in an intimate relationship. Societal movements such as #MeToo have highlighted issues of gender equity, including the urgency of studying sexual trauma and its sequelae in women. A large body of evidence indicates the importance of sexual trauma to mental health, and there is some evidence suggesting that exposure to trauma and related distress is associated with increased risk of cardiovascular disease. However, despite growing interest from the public and scientists, there has been limited study of the impact of sexual trauma on women's physical health or cardiovascular health more specifically. This symposium brings together research focused on women's health across the lifespan to study the prevalence of sexual trauma in young, midlife, and older women and its impact on cardiovascular health and associated risk factors, including carotid atherosclerosis, sleep, and blood pressure. Speakers are past or present members from a single lab across three stages of career development. The first speaker, a Professor and senior investigator, will present findings indicating that exposure to sexual assault in midlife women is related to greater carotid atherosclerosis level and progression over midlife. The second speaker, a former predoctoral trainee and current Assistant Professor, will present results indicating that older women who report that their first experience of sexual intercourse was forced or coerced demonstrate higher blood pressure. The third speaker, a postdoctoral trainee, will present work suggesting that college-aged females with a history of dating violence before age 18, particularly sexual violence, have poorer sleep. Finally, the discussant, a former mentor of the senior investigator and a leading expert on the relationships of trauma, psychological distress, and cardiovascular health, will discuss key

issues in research on sexual violence and health and highlight how the presented science helps address important knowledge gaps. Collectively, the research we will present addresses the issue of women's health equity, speaks to the pervasive nature of sexual trauma, and informs how sexual violence can impact cardiovascular health.

Individual Abstract Number: 1682

Sexual Assault and Carotid Plaque Over Midlife in Women

Rebecca C. Thurston, PhD, Psychiatry, Yue-Fang Chang, PhD, Neurosurgery, University of Pittsburgh, Pittsburgh, PA, Karestan Koenen, PhD, Epidemiology, Harvard T.H. Chan School of Public Health, Boston, MA, Pauline Maki, PhD, Psychiatry, University of Illinois at Chicago, Chicago, IL, Karen A. Matthews, PhD, Psychiatry, Emma Barinas-Mitchell, PhD, Epidemiology, University of Pittsburgh, Pittsburgh, PA

Background: Sexual assault is prevalent, with 36% of US women reporting a lifetime history of sexual assault. While sexual assault is a well-known risk factor for poor mental health, its relation to physical health, particularly cardiovascular disease risk, is less well understood. We tested whether women with a sexual assault history had greater carotid atherosclerosis level and progression over midlife.

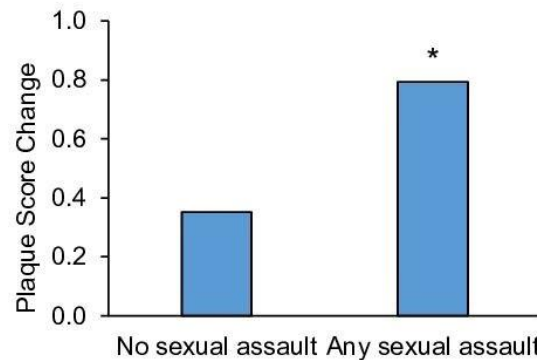
Methods: A community cohort of 144 nonsmoking, cardiovascular disease-free women aged 40-60 were assessed at two time points over five years. At each time point, women completed questionnaire assessments of sexual assault, demographics, and depressive symptoms; height, weight, and blood pressure; fasting phlebotomy; three days of actigraphy sleep assessments; and a carotid ultrasound for detection and scoring of carotid plaque. Associations between sexual assault and carotid plaque level (score 0, 1, ≥ 2) and progression (plaque score change) were assessed in multinomial logistic and linear regression models, respectively. Covariates were selected based upon their relation to plaque (age, race/ethnicity, education, body mass index, lipids, and anti-hypertensive, anti-diabetic, lipid-lowering medications). Additional models considered depressive symptoms and sleep.

Results: The 144 women (69% White, 31% Black) were on average 54 years at baseline. 29% of the women reported a sexual assault history at either point. At baseline, 44% showed carotid plaque [26% with high plaque score ≥ 2]. Average plaque score progression was .5 (range -2-5). At baseline, women with a sexual assault history had a 5-fold odds of high plaque [≥ 2 , OR (95%CI)=4.90 (1.64-11.51), $p=.01$; 1, OR (95%CI)=.53 (.13-2.21, $p=.38$), vs. no plaque; multivariable]. At follow up, women reporting a history of sexual assault at either time point had a 4-fold odds of high plaque [≥ 2 , OR (95%CI)=4.03 (1.52-10.69), $p=.005$; 1, OR (95%CI)=1.14 (.32-4.05, $p=.84$), vs. no plaque; multivariable]; these women also had greater plaque progression over time [B(SE)=.46 (.20), $p=.01$, Figure]. Results persisted when also adjusted for sleep and depressive symptoms.

Conclusions: Sexual assault is associated with greater carotid atherosclerosis level and progression over time at midlife. Findings underscore the potential cardiovascular sequelae of sexual violence in women.

Funding: R01HL105647, RF1AG053504, 2K24HL123565

Figure. Adjusted mean plaque progression over five year by sexual assault history



* $p<.05$; Adjusted for age, race/ethnicity, education, body mass index, lipids, and medication use (anti-hypertensive, anti-diabetic, lipid-lowering)

Individual Abstract Number: 1683

Forced or Coerced Sexual Initiation is Associated With Elevated Blood Pressure Among Older Community-Dwelling Women

Carolyn J. Gibson, PhD, MPH, Psychiatry, Nadra E. Lisha, PhD, General Internal Medicine, Pooja Lalchandani, BA, Alison J. Huang, MD, MAS, Medicine, University of California, San Francisco, San Francisco, CA

Background: Forced or coerced sexual initiation was found to be common and linked to a range of later health outcomes in a recent study of reproductive-aged women. Associations with cardiovascular outcomes were not seen, possibly because these conditions more commonly emerge later in life. Further, little is known about the prevalence and health-related impact of these exposures among older women. In this study, we examined the relationship between history of forced or coerced sexual initiation and current blood pressure, a major risk factor for cardiovascular disease, among older women.

Methods: We analyzed data from the National Social Life, Health, and Aging Project (NSHAP), a national area probability sample of community-dwelling adults born between 1920-1947. We used cross-sectional data from home-based study visits conducted in 2010-2011 to examine self-reported forced or coerced sexual initiation and mean systolic blood pressure measured by trained study staff during study visits among women participants. Multivariable linear regression models were used to relate forced or coerced sexual initiation and blood pressure, adjusting for age, race/ethnicity, body mass index, and education. In exploratory models, we further adjusted for antihypertensive medication use, derived from in-person review of current prescribed medications during home-based study visits.

Results: In this sample of 1778 older women (mean age 72 ± 8 years), 5% reported that their first experience of sexual intercourse was forced, and 33% reported it as coerced. Mean systolic blood pressure values were elevated for all women during study visits (mean=137.15, SD=21.14). In multivariable analyses, forced or coerced sexual initiation was associated with higher blood pressure (B=2.83 (SE=1.07), $p<.01$). These findings were equivalent when further adjusted for antihypertensive medication use.

Conclusion: History of forced or coerced sexual initiation is common among older women and may impact aging-related health. These findings point to the need for greater recognition of the prevalence and importance of traumatic exposures by clinicians caring for older women.

Individual Abstract Number: 1478

Dating Violence Before Age 18 is Associated With Poor Subjective Sleep Among College-Aged Women

Karen P. Jakubowski, PhD, Karen A. Matthews, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

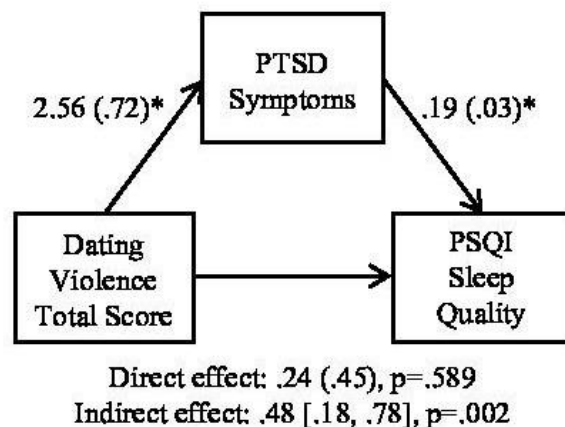
Introduction: Evidence suggests dating violence (by romantic partners) is related to poor mental health in young women, but few studies have examined sleep. We examined whether psychological, physical, and sexual dating violence are related to sleep in young women, adjusting for covariates including childhood socioeconomic status (SES) and adverse childhood experiences (ACEs; e.g., abuse, neglect). Secondary analyses examined whether post-traumatic stress disorder (PTSD) symptoms mediated dating violence-sleep relationships.

Methods: Female undergraduates (N=269, 70% white, mean age = 18) participated in a study of childhood experiences and sleep. Surveys assessed dating violence, sleep, PTSD, and ACEs. Women reported frequency of psychological, physical and sexual dating violence before age 18 (summed to continuous scale score). Sleep quality and health were measured via validated scales, including Pittsburgh Sleep Quality Inventory (PSQI, higher=worse) and RUSATED scale (six dimensions of sleep; higher=better), respectively. Surveys also assessed exposure to 10 ACEs before age 18. PTSD symptoms were obtained via the PTSD Checklist-Civilian version, which does not assess sleep. Linear regressions examined associations between dating violence (total score, subtypes) with sleep quality and health. Covariates included age, race, self-reported body mass index, SES and ACEs. Secondary analyses examined whether PTSD symptoms mediated the association of dating violence to sleep (bootstrapping with 1000 resamples).

Results: 21.2% of women reported dating violence (psychological: 16.4%, physical: 1.9%, sexual: 8.9%). Sleep quality and sleep health were poor. Greater dating violence was associated with poorer sleep quality [B(SE)=.72 (.36), $p=.04$] and somewhat poorer sleep health [B(SE)=.74 (.38), $p=.05$]. Of the subtypes, sexual violence was particularly associated with worse sleep health [B(SE)=1.15 (.42), $p=.03$]. PTSD symptoms significantly mediated the relationship between total dating violence and sexual violence and both sleep quality and health, $ps<.05$.

Conclusion: Among young women, dating violence was prevalent and related to poor subjective sleep quality and health. Results persisted beyond SES and ACEs and were mediated by PTSD symptoms. Findings suggest that dating violence may place women on a trajectory of poor sleep and perhaps later cardiovascular risk.

Figure. PTSD symptoms mediate the relationship between dating violence and sleep quality



Note. Values reflect unstandardized coefficient (standard error) or [95% CI]. Adjusted for age, race, BMI, childhood SES, and ACEs. Higher=worse sleep quality. $*p < .05$

PAPER SESSION:

A LOOK ON THE BRIGHT SIDE: POSITIVITY AND HEALTH RESILIENCE

Saturday, March 14 from 2:00 to 3:00 pm

Abstract 1031

DOES OPTIMISM AND RELIGIOUS IDENTITY MODERATE THE ASSOCIATION BETWEEN SOCIOECONOMIC MOBILITY AND DEPRESSIVE SYMPTOMS AMONG WHITE AND BLACK ADULTS?

Agus Surachman, MS, August Jenkins, MS, Alexis Santos, PhD, Alyssa Gamaldo, PhD, David M. Almeida, PhD, Human Development and Family Studies, The Pennsylvania State University, University Park, PA

The goal of this study was two-fold: 1) to examine the heterogeneity of socioeconomic mobility among White and Black adults based on both subjective and objective socioeconomic status (SES) indicators across the life course, and 2) to examine the moderating role of optimism and religious identity on the association between socioeconomic mobility and depressive symptoms within each racial group. Data were from the second wave of the Midlife in the United States (MIDUS) study, including 1,200 adults (ages = 34-84; n Black = 215) who completed the baseline survey and biomarker components of the study. Socioeconomic mobility was modeled based on parental education levels, subjective childhood financial condition, participant's education level, income, and three indicators related to current subjective financial strains. Depressive symptoms were measured using the Center for Epidemiological Studies Depression (CES-D) inventory. The heterogeneity of socioeconomic mobility and its association with depressive symptoms and protective factors was examined using latent class analysis. Blacks and Whites showed different patterns of socioeconomic mobility across the life course. Among Blacks, the latent classes of socioeconomic mobility were: (1) Always High (36.79% class prevalence; high childhood SES, education, and adult SES), (2) Downwardly Mobile (18.05%; high childhood SES and education, low adult SES), and (3) Always Low (45.16%; low childhood SES, education, and adult SES). Among Whites, the latent classes were: (1) Always High (40.51%; high childhood SES, education, and adult SES), (2) Upwardly Mobile (39.99%; low childhood SES, high education and adult SES), (3) Subjectively Downward (12.48%; high childhood SES, high education, high objective adult SES, low subjective adult SES), and (4) Always Low (7.02%; low childhood SES, education, and adult SES). Class membership predicted depressive symptoms among Blacks and Whites. Among Blacks, high religious identity buffered the negative impact of socioeconomic adversity on depressive symptoms, while among Whites, it was high optimism that buffered the detrimental effect of low SES on depressive symptoms. Within-race analysis is critical in understanding the importance of specific protective factors on moderating the association between socioeconomic adversity and depressive symptoms.

Table 1 Descriptive statistics for demographic characteristics, class indicators, moderators, and outcomes

	M (SD) / %		t / χ^2
	Black ($n = 215$)	White ($n = 985$)	
Age	51.02 (10.62)	55.53 (11.89)	5.13 ***
Female	67.9	55.6	
Life course socioeconomic status			
Parent's education graduated from high school or higher	44.9	63.9	23.65 ***
High subjective financial status during childhood	62.2	68.2	2.83
Participant's education some college or higher	53.5	76.1	44.63 ***
Household income to poverty ratio higher than 150%	41.9	78.3	115.45 ***
High current financial status	40.2	71.2	78.44 ***
Enough/ more money to meet basic needs	44.2	83.7	153.73 ***
Not difficult to pay monthly bills	43.3	75.9	89.52 ***
Optimism	12.22 (2.41)	12.03 (2.36)	1.01
Religious identity	22.07 (4.51)	19.65 (5.89)	5.44 ***
Depressive symptoms	12.19 (9.65)	7.94 (7.68)	6.94 ***

Note: M = mean, SD = standard deviation, t = t score from independent t -test (degrees of

freedom/ $df = 1$), χ^2 = chi-square value from chi-square tests ($df = 1$)

Table 2 Model fit information for latent class analysis

No. of classes	Log-likelihood	No. of parameters estimated	AIC	BIC	a-BIC	Entropy	BLRT
Black and White combined ($n = 1,200$)							
1	-5085.86	7	1321.33	1356.96	1334.72	—	—
2	-4607.18	15	379.98	456.33	408.68	.84	$p < .05$
3	-4534.85	23	252.32	368.39	295.34	.66	$p < .05$
4	-4505.17	31	207.96	365.75	267.28	.72	$p < .05$
5	-4492.05	39	197.70	396.22	272.34	.72	$p < .05$
Black ($n = 215$)							
1	-1000.72	7	279.40	302.99	280.81	—	—
2	-929.90	15	153.76	204.32	156.76	.87	$p < .05$
3	-919.70	23	149.34	226.87	153.99	.74	$p < .05$
4	-911.31	31	148.57	253.06	154.83	.78	$p = .06$
5	-903.68	39	149.31	280.77	157.18	.77	$p = .22$
White ($n = 985$)							
1	-3853.07	7	956.99	991.24	969.01	—	—
2	-3537.83	15	342.51	415.90	368.26	.89	$p < .010$
3	-3468.68	23	220.20	332.74	259.69	.66	$p < .050$
4	-3448.97	31	196.80	348.47	250.02	.73	$p < .050$
5	-3438.59	39	192.04	382.85	421.85	.78	$p = .052$

Note: Dashes indicate criterion was not applicable; boldface type indicates selected model. AIC = Akaike information criterion; BIC = Bayesian information criterion; a-BIC = sample size adjusted BIC; BLRT = bootstrapped likelihood ratio test.

Measurement invariance based on race indicated that Blacks and Whites showed different pattern of socioeconomic mobility (at $p < .05$). Thus, pattern of socioeconomic mobility was examined within each racial group.

Table 3 Latent class membership probabilities and item-response probabilities				
Black ($n = 215$)				
Indicator	Class 1: Always Low (45.16%)	Class 2: Downwardly Mobile (18.05%)	Class 3: Always High (36.79%)	
Childhood SES				
Parent graduated from HS/GED or higher (O)	.40	.51	.47	
High financial level growing up (S)	.66	.71	.53	
Education				
Some college or higher (O)	.11	1.00	.83	
Adult SES				
High income to poverty ratio (O)	.16	.37	.76	
High current financial status (S)	.24	.08	.75	
Enough money to fulfill basic needs (S)	.25	.08	.85	
Not difficult paying bills (S)	.30	.00	.81	
White ($n = 985$)				
Indicator	Class 1: Always Low (7.02%)	Class 2: Subjectively Downward (12.48%)	Class 3: Upwardly Mobile (39.99%)	Class 4: Always High (40.51%)
Childhood SES				
Parent graduated from HS/GED or higher (O)	.41	.74	.37	.91
High financial level growing up (S)	.81	.55	.87	.52
Education				
Some college or higher (O)	.00	1.00	.60	.97
Adult SES				
High income to poverty ratio (O)	.58	.65	.72	.92
High current financial status (S)	.19	.07	.82	.91
Enough money to fulfill basic needs (S)	.28	.28	.99	.95
Not difficult paying bills (S)	.17	.03	.94	.90

Note: Boldface type indicates high probability for the indicator. O = objective indicator of SES; S = subjective indicator of SES.

Table 4
Expected mean of optimism, religious identity, and depressive symptoms based on classes of socioeconomic mobility within Black and White

Note: df = degrees of freedom; SE, Standard Error

Black ($n = 215$)					
Outcome	Omnibus Test (Wald χ^2 , $df = 2$)	Class 1: Always Low (45.16%)	Class 2: Downwardly Mobile (18.05%)	Class 3: Always High (36.79%)	Mean \pm SE
Optimism	4.96 ($p = .08$)	11.75 \pm 0.31	12.44 \pm 0.51	12.68 \pm 0.25	
Religious identity	3.40 ($p = .18$)	21.87 \pm 0.52	23.40 \pm 0.76	21.68 \pm 0.62	
Depressive symptoms	15.00 ($p < .001$)	14.92 \pm 1.08	12.70 \pm 1.84	8.70 \pm 1.09	

White ($n = 985$)					
Outcome	Omnibus Test (Wald χ^2 , $df = 3$)	Class 1: Always Low (7.02%)	Class 2: Subjectively Downward (12.48%)	Class 3: Upwardly Mobile (39.99%)	Class 4: Always High (40.51%)
Optimism	32.18 ($p < .001$)	11.25 \pm 0.28	10.94 \pm 0.28	12.10 \pm 0.15	12.43 \pm 0.14
Religious identity	18.22 ($p < .001$)	20.73 \pm 0.65	20.10 \pm 0.56	20.66 \pm 0.36	18.33 \pm 0.33
Depressive symptoms	39.52 ($p < .001$)	12.08 \pm 1.12	11.87 \pm 0.99	7.17 \pm 0.43	6.78 \pm 0.43

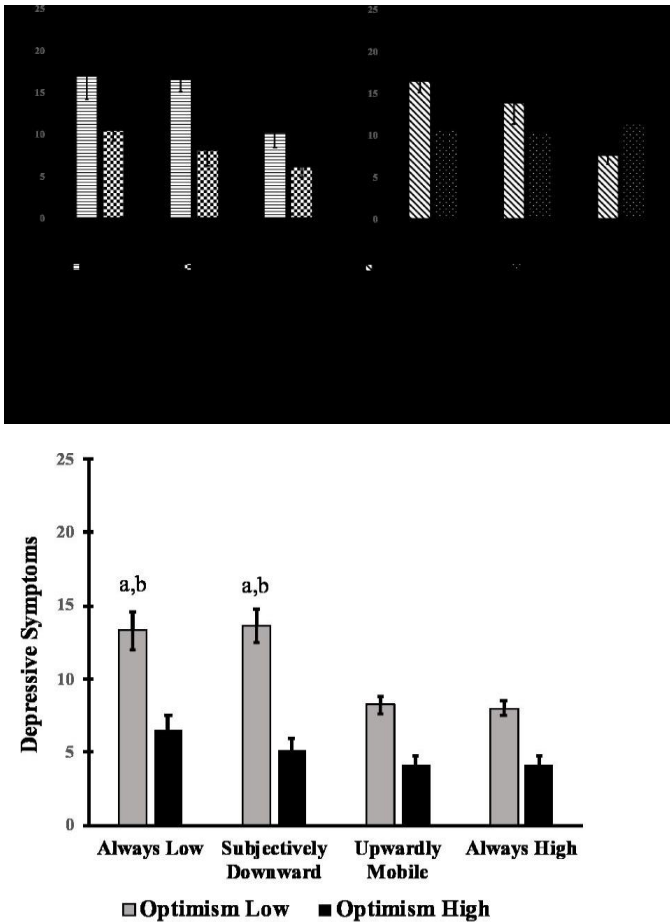


Figure 2. The association between latent class membership of socioeconomic mobility and depressive symptoms based on optimism among White adults. There was a gradient of depressive symptoms based on socioeconomic mobility among those with the lower levels of optimism (Wald χ^2 [3] = 34.60, $p < .05$). On the other hand, higher score of optimism buffer the negative impact of low SES on depressive symptoms among White adults (Wald χ^2 [3] = 4.59, $p > 0.05$). The moderating role of religious identity among White was unable to be examined given that measurement invariance assumption was not hold among White adults.
a = significantly different from the Always High class ($p < .05$)
b = significantly different from the Upwardly Mobile class ($p < .05$)

Abstract 1105

ENJOYMENT OF LIFE PREDICTS TYPE 2 DIABETES INCIDENCE OVER 12 YEARS OF FOLLOW-UP: FINDINGS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING

Laura Panagi, MSc, Ruth A. Hackett, PhD, Andrew Steptoe, DPhil, DSc, Behavioural Science and Health, University College London, London, United Kingdom, Lydia Poole, PhD, Behavioural Science and Health, University College London, United Kingdom, United Kingdom
Background: Subjective well-being is usually divided into two sub-components; hedonic well-being and eudemonic well-being. Previous research has shown that greater subjective well-being may protect against the onset of type 2 diabetes (T2D), independently of negative affect. However, it is not yet known whether this association is similar across the different types of well-being.

Purpose: The purpose of this study was to examine the prospective association between hedonic and eudemonic well-being with incident T2D after adjusting for covariates.

Methods: We used data from 3956 diabetes-free participants drawn from the English Longitudinal Study of Ageing, a nationally representative cohort study of older adults living in England (mean age = 65.00 years [SD = 9.01]). Enjoyment of life and purpose in life were assessed using items from the CASP-19 as measures of hedonic and eudemonic well-being respectively. Sociodemographic, behavioural and clinical characteristics were also collected at baseline. Over the 12-year follow-up period participants reported doctor diagnosis of T2D. Hazard ratios were tested using Cox proportional hazards regression analysis.

Results: We found a significant inverse relationship between enjoyment of life and rate of T2D onset. Specifically, for every unit increase in reported enjoyment of life there was a 12% reduction in the hazard of T2D (Hazard Ratio = 0.88, 95 % Confidence Interval = 0.81 to 0.97, $p = 0.006$), after adjusting for age, sex, financial wealth, employment status, ethnicity, marital/cohabitation status, body mass index, physical activity, smoking, alcohol consumption, hypertension, myocardial infarction, stroke, glycated haemoglobin, and depression. Purpose in life showed a non-significant association with T2D incidence. These associations did not differ by age or sex.

Conclusions: The study adds to our understanding of the role of subjective well-being by illustrating how the link with T2D incidence varies according to type of well-being. Systematic intervention studies that demonstrate that changes in enjoyment of life can delay diabetes onset are required.

Abstract 1696

PERCEIVED STRESS, PSYCHOLOGICAL RESILIENCE, HAIR CORTISOL CONCENTRATION, AND METABOLIC SYNDROME SEVERITY: A MODERATED MEDIATION MODEL

H. Matthew Lehrer, Ph.D., Psychiatry, University of Pittsburgh, Pittsburgh, PA, Mary A. Steinhardt, Ed.D., Kinesiology and Health Education, The University of Texas at Austin, Austin, TX, Susan K. Dubois, M.D., Internal Medicine, Dell Medical School, The University of Texas at Austin, Austin, TX

Background: Psychological resilience is considered to protect against detrimental effects of perceived stress on cardiovascular and metabolic health, but few studies have tested biological mechanisms underlying these relationships.

Purpose: This study examined whether psychological resilience moderated the indirect association of perceived stress with Metabolic Syndrome (MetS) severity via hair cortisol concentration (HCC), a retrospective index of hypothalamic pituitary adrenal (HPA) axis activity.

Method: Participants included 228 adults (73 White, 86 Hispanic, 69 African American; mean age 45.29 years; 68% females). Participants completed questionnaires assessing perceived stress (Perceived Stress Scale) and resilience (Brief Resilience Scale). The first 3 cm of scalp-near hair were analyzed for cortisol concentration using enzyme-linked immunoassay analysis. Cardiometabolic risk factors including blood glucose, lipids, blood pressure, and waist circumference were assessed, from which a sex- and race/ethnicity-specific continuous MetS severity score was calculated. A moderated mediation model was tested using path analysis.

Results: Psychological resilience moderated the association of perceived stress with HCC (R^2 change for interaction = 0.014, $p = 0.043$), such that the association of perceived stress and HCC decreased as resilience scores increased. Resilience also moderated the indirect association of perceived stress with MetS severity via HCC ($b = -0.039$, 95% CI [-0.001; -0.100]), such that HCC mediated the association of greater perceived stress with greater MetS severity only for individuals reporting Brief Resilience Scale scores 3 or below (range: 1.17-5.00). Psychological resilience was also associated with

lower MetS severity ($b = -0.227, p = 0.014$) independent of perceived stress and HCC.

Conclusion: Findings suggest that psychological resilience may serve as both a stress buffer and as a direct determinant of cardiometabolic health. These results extend literature on psychological resilience to measures of retrospective HPA axis function and MetS severity in a diverse sample.

Abstract 1285

A POSITIVE PSYCHOLOGY-MOTIVATIONAL INTERVIEWING INTERVENTION TO PROMOTE PHYSICAL ACTIVITY IN TYPE 2 DIABETES: THE BEHOLD RANDOMIZED CONTROLLED TRIALS

Jeff C. Huffman, MD, Psychiatry, Massachusetts General Hospital, Lexington, MA, Julia Golden, B.A., Psychiatry, Deborah Wexler, M.D., Medicine, Christopher M. Celano, M.D., Rachel Millstein, PhD, Emily Feig, PhD, Psychiatry, MGH, Boston, MA

Background/Significance: Positive psychological constructs (e.g., optimism, positive affect) have been linked to greater physical activity and better health outcomes in persons with type 2 diabetes. However, there has been minimal study to determine whether cultivating these characteristics results in improved activity and health.

Methods: The BEHOLD trials were a pair of randomized controlled trials that compared a phone-delivered, combined positive psychology-motivational interviewing (PP-MI) intervention to a control condition. In both studies, participants were patients with a diagnosis of type 2 diabetes with suboptimal baseline physical activity as measured by accelerometer, and participants in all groups received a condition-specific treatment manual and a pedometer to promote physical activity.

In Trial 1, a 16 week PP-MI intervention was compared to an attention-matched educational control condition, and in Trial 2 and 8 week PP-MI intervention was compared to an 8 week MI-alone condition. This design allowed us to make comparisons within each trial, and also to compare the impact of the 8 week and 16 week PP-MI programs across the two studies to efficiently identify the optimal intervention type and duration. For both studies, the primary outcome measure was moderate to vigorous physical activity as measured by accelerometer, with secondary psychological, behavioral, and medical outcomes. IRB approval was obtained for both studies and all participants provided written informed consent. Both studies were pre-registered on clinicaltrials.gov.

Results: We have completed enrollment ($N=130$) and follow-up assessments across the two trials, and we will have study results--both the individual study results and the comparison of the impact of the 8 vs. 16 week PP-MI program across studies--by the time of the APS annual meeting.

Discussion: These trials aim to determine whether a combined PP-MI intervention leads to greater physical activity than an attention-matched education condition or MI alone, and if it is effective, which intervention duration appears most beneficial

Conclusion/Implications: If efficacious, such an intervention could be both applicable and powerful, given the simple phone-based delivery of the intervention and the relationship between physical activity and adverse events in type 2 diabetes.

PAPER SESSION:

ADVANCES IN HEART RATE VARIABILITY

Friday, March 13 from 2:45 to 4:00 pm

Abstract 1728

LONG-TERM NON-INVASIVE VAGUS NERVE STIMULATION AND COGNITIVE CHANGES: PRELIMINARY RESULTS FROM A RANDOMIZED PLACEBO WAITLIST CONTROLLED TRIAL

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Background: Decreased vagal modulation may play an etiological role in cognitive function changes. The efficacy of a non-invasive and safe 2 weeks transcutaneous vagus nerve stimulation (tVNS), an intervention that should have a direct influence on brain systems underlying cognitive changes is unknown. Here we aim to test its effect in young and older adults.

Methods: Data from first two timepoints of an ongoing clinical trial NCT04070547 were used. Results presented here are based on 15 young (aged 20-35 years) and 22 older adults (aged 59-75 years) who were randomized into tVNS, placebo or waiting control groups. Neurocognitive performance including memory, inhibitory control, cognitive flexibility and working memory was evaluated pre- and post-2 weeks of tVNS/placebo stimulation (4hours/day) or waiting period using Auditory Verbal Learning test, Flanker, SetShifting and Nback tests. Linear mixed models were performed. Cohen's d was calculated as a measure of effect size.

Results: In general, scores in cognitive tests increased over time. Significant group-by-time interactions favoring the tVNS stimulation group in cognitive performance change over the 2 weeks was observed in older adults in inhibitory control test ($p=0.013$) and in young adults in memory test ($p<0.001$); the improvement was moderate and moderate-to-large in magnitude. Compared with the older tVNS group, those who undergone placebo stimulation ($\beta=-0.5$; 95% CI -0.87 to -0.12; $p=0.009$; $d=0.56$) or were on the waiting list ($\beta=-0.5$; 95% CI -0.85 to -0.15; $p=0.005$; $d=0.6$) had lower increase in score of inhibitory control over the 2 weeks. Compared with the young tVNS stimulation group, those young adults who were in the placebo ($\beta=-9.87$; 95% CI -15.1 to -4.6; $p=0.001$; $d=0.96$) or waitlist group ($\beta=-4.06$; 95% CI -8.3 to 0.13; $p=0.058$; $d=0.46$) had lower increase in memory score over time.

Conclusion: Transcutaneous vagus nerve stimulation may result in some cognitive improvement specific to younger or older agegroups. However as the results were generated from a small sample size, further and complex evaluation of tVNS in cognitive functioning is warranted.

Funding: Czech Science Foundation (grant number:17-22346Y).

Abstract 1185

HEART RATE VARIABILITY BIOFEEDBACK PROMOTES GENERAL RESILIENCE

Paul Lehrer, PhD, Psychiatry, Rutgers Robert Wood Johnson Medical School, Piscataway, NJ, Karenjot Kaur, MA, Health Psychology, Ferkauf Graduate School, Yeshiva University, Colonia, NJ

Objective: We performed a systematic and meta analytic review of variability biofeedback (HRVB) effects on general resilience. HRVB seems to improve many biological and psychological problems, including emotional, cardiovascular, gastrointestinal, and respiratory disorders, and to improve athletic, cognitive, and artistic performance.

Method: We included randomly controlled studies on all applications of HRVB through November 15, 2018. We analyzed all measures used in all studies.

Results: Our initial review yielded 1868 papers, from which 58 met inclusion criteria. A significant moderate effect size for HRVB / PB on resilience was found, Hedges' $g = -0.4$, with negative values favoring the treatment condition. Without four outliers heterogeneity is small and effect sizes remain moderate and significant $g = -.30$, with a narrow prediction interval. Compared with other active treatments, the effect size remains moderate. With small number of studies for each, the effect sizes for improvement in most individual conditions are moderate, with the highest effects for anxiety, depression, anger and athletic/artistic performance and the lowest effect sizes for PTSD, sleep, and behavioral functioning. Meta regression analyses found no

significant effects for number of treatment sessions, number of weeks between pretest and post-test, type of control (active, inactive, or placebo), whether the outcome measure was targeted to the population, or year of publication.

Conclusion: The results suggest that HRVB does promote general resilience with a moderate advantage over other commonly used active treatments. Further research is needed to confirm the efficacy of the procedure for particular applications.

Abstract 1377

HEART RATE VARIABILITY MODERATES THE RELATIONSHIP BETWEEN TRAIT ANXIETY AND BIASED ATTENTION TO THREAT

Aaron E. Miller, MBA, Biochemistry, Morgan L. Shakeshaft, B.A., Isabel L. Barros, B.S., Karissa G. Miller, PhD, Psychology, California State University, Long Beach, Long Beach, CA

Individuals with anxiety have shown preferential attention to threat-related information, though the mechanisms that explain this relationship are unclear. Recent studies have examined psychophysiological indicators that may contribute to threat biases such as low cardiac vagal tone [assessed via high frequency heart rate variability, (HF-HRV)]. In non-anxious populations, low HF-HRV is associated with bias-relevant attentional processes which may facilitate increased vigilance to and decreased disengagement from threat. Anxious individuals also show lower HF-HRV suggesting these threat biases may be influenced by HF-HRV, though few studies have examined these relationships among anxious individuals. Here, we examined whether HF-HRV moderated relationships between trait anxiety (TA) and threat biases among a group of 62 high ($M_{STAI}=45.64, \pm 6.67$) and 44 low ($M_{STAI}=27.91, \pm 3.44$) TA participants ($M_{age}=25.85, \pm 13.21$, 61% female, 67% white) taken from a larger threat bias modification study conducted at the University of Pittsburgh. Extent of vigilance toward and disengagement from threatening relative to neutral stimuli were calculated from response time data using a computerized attention bias measure (ARDPEI); respiration-adjusted HF-HRV was derived from a 5-min ECG recording at rest. Separate hierarchical linear regression analyses were used to predict extent of vigilance toward and disengagement from threat with TA (low vs high), HF-HRV, and the interaction term (centered HF-HRV* TA) included in each model. Results indicated that neither TA nor HF-HRV were related to threat disengagement. In the model predicting threat vigilance, neither TA ($\beta = -.08, p=.43$) nor HF-HRV ($\beta = -.55, p=.07$) independently predicted threat vigilance, however an antagonistic interaction between TA and HF-HRV emerged ($\beta = .73, p=.02$) (see Figure 1). Probing of the interaction showed that among low-TA individuals, lower HF-HRV was associated with increased threat vigilance, but that this relationship was reversed among high-TA individuals such that lower HF-HRV was associated with decreased threat vigilance ($F(3,102)=2.89, p=.04, R^2=.08$). These results indicate that relationships among cardiac vagal tone and vigilance differ in anxious individuals and highlight vigilance toward threat as relevant to studies examining the psychophysiological correlates of threat processing and anxiety.

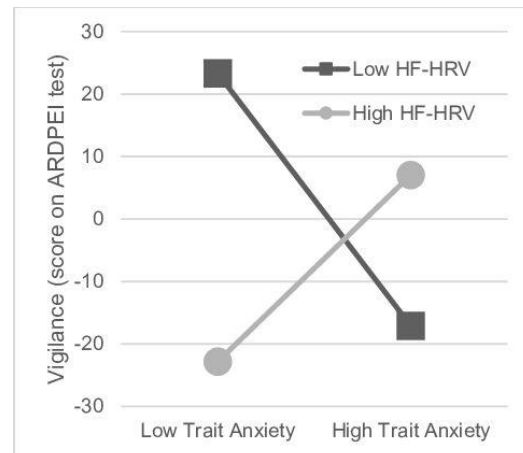


Figure 1. Relationships between vigilance to threat and HF-HRV in low trait and high trait-anxious individuals

Abstract 1749

RESTING HIGH FREQUENCY HEART RATE VARIABILITY IN VETERANS WITH PTSD: EFFECTS OF RESPIRATION, ROLE IN ELEVATED HEART RATE, AND EXTENSION TO SPOUSES

Timothy W. Smith, PhD, Carlene Deits-Lebehn, MS, Department of Psychology, University of Utah, Salt Lake City, UT, Catherine Caska-Wallace, PhD, Behavioral Health Interdisciplinary Program, Coatesville VAMC, Coatesville, PA, Keith D. Renshaw, PhD, Department of Psychology, George Mason University, Fairfax, VA, Bert N. Uchino, PhD, Department of Psychology, University of Utah, Salt Lake City, UT

Posttraumatic stress disorder (PTSD) is associated with reduced vagally-mediated heart rate variability (vmHRV), but the possible confounding role of respiration rate and amplitude in this association has not been studied sufficiently. Further, it is possible that low parasympathetic inhibition contributes to the well-established association of PTSD with elevated resting heart rate (HR), but this hypothesis also has not been examined sufficiently. Finally, it is possible that reduced vmHRV is also apparent in the intimate partners of individuals with PTSD, given that they show elevated levels of emotional distress and substantial relationship difficulties. In a study of 65 couples comprising male Iraq/Afghanistan War Veterans and their female partners (PTSD group N= 32; Comparison group N= 33), PTSD was documented by structured interview and self-report. Baseline HR, high-frequency heart rate variability (hfHRV), cardiac pre-ejection period (PEP), and respiratory rate and depth were measured via impedance cardiography. Veterans with PTSD displayed reduced baseline hfHRV, (5.99 vs. 5.16, SD = 1.15, 1.48), $F(1, 62) = 6.24, p=.015, d=.6$, even when controlling respiration rate and amplitude, but their partners did not. Veterans with PTSD also displayed elevated HR, (77.3bpm vs. 69.6bpm; SD = 12.4 vs. 10.8), $F(1, 62) = 5.41, p=.023, d=.6$, an association that was accounted for by hfHRV, indirect effect = 4.44; SE = 1.85 (CI = 1.24 to 8.41), but not by PEP. These results strengthen the evidence that PTSD is associated with lower parasympathetic activity, and suggest further that lower parasympathetic activity may account for the elevated resting HR commonly seen in PTSD. The preserved vmHRV in spouses of Veterans with PTSD may have a variety of potential beneficial consequences for an otherwise high-risk group.

Abstract 1798

PROPERTIES OF THREE COMMON TIME DOMAIN INDICES OF HEART RATE VARIABILITY: EFFECTS OF DETRENDING

Julian F. Thayer, PhD, DeWayne P. Williams, PhD, Department of Psychological Science, University of California, Irvine, Irvine, OH, Mika P. Tarvainen, PhD, Department of Applied Physics, University of Eastern Finland, Kuopio, NA, Finland

Heart rate variability (HRV) has become a common measure in both research and clinical applications. Many turnkey systems as well as mobile device apps now routinely report indices of HRV. Therefore, a better understanding of the properties of these indices is needed. Lewis and colleagues (2012) investigated the properties of several HRV indices but did not examine common time domain indices. Importantly, they concluded that when the various indices met certain criteria they each could provide valid indices of vagally-mediated HRV largely free from the effects of respiration and lack of stationarity. The two criteria were 1) normal distribution, and 2) higher-order detrending with higher order detrending being essential to minimize the effects of respiration. Tarvainen and colleagues (2002) demonstrated the effects of detrending on both time and frequency domain indices of HRV and showed that the root mean squared successive difference (RMSSD) and the percentage of IBI differences greater than 50 milliseconds (pNN50) were both robust to detrending compared to the standard deviation of the IBI series (SDNN). However, they only had four participants and no statistical analyses were performed. In the present study 67 participants were recorded during a five-minute resting baseline and the three time-domain indices of RMSSD, pNN50 and SDNN with and without smoothness priors detrending examined. Results indicated statistically significant differences with large effect sizes between the SDNN values with and without detrending (mean difference = 14.6 ms). For both RMSSD and pNN50, the effect of detrending was minimal (mean diffs < 1.7ms and < 0.16% for RMSSD and pNN50, respectively). These results support the use of RMSSD without additional detrending as an index of vagally-mediated HRV largely free of the effects of respiration rate and non-stationarity. In addition, it shows that RMSSD acts as a locally stationary high-pass filter that minimizes the effects of slower trends reflecting respiration rate and other non-periodic influences.

PAPER SESSION:

AFFECT, COGNITION, AND THE HEART

Thursday, March 12 from 10:30 to 11:30 am

Abstract 1627

PROSPECTIVE VALIDATION OF A BIOPSYCHOSOCIAL MODEL EXPLAINING PERSISTENT NCCP-RELATED DISABILITY

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Background: Non-cardiac chest pain (NCCP) is a common symptom affecting up to a third of the general adult population in a given year. In nearly a quarter of cases, these NCCP episodes will be significant enough to prompt a medical consultation. About one in five patients will experience persistent NCCP-related disability in the 2 years following an emergency department visit. In 1998, Mayou proposed a biopsychosocial model to explain this phenomenon. This study aims to prospectively validate an updated and adapted biopsychosocial model of persistent NCCP-related disability.

Method: Patients with NCCP were consecutively recruited in two emergency departments. The initial assessment included a validated

interview to assess panic disorder and generalized anxiety disorder and a structured interview to assess personal and family medical history, smoking status, socio-demographics and NCCP-related disability. Patients also completed a battery of self-report questionnaires to assess anxiety and depressive symptoms, cardiac anxiety, anxiety sensitivity, social support, gastrointestinal symptoms and alexithymia. NCCP-related disability was reassessed 6 months, 12 months and 24 months later to establish the presence of persistent difficulties. Path analysis was used to test the proposed biopsychosocial model of persistent NCCP-related disability.

Results: All measures were completed by 494 patients (mean age = 55.8, SD = 14.7; 53% females) of which 19.4% (n = 96) experienced persistent NCCP-related disability. The fit of the final model, as assessed by the Root Mean Square Error of Approximation (0.04, 90% confidence interval: 0.00-0.07), was satisfactory. A history of a musculoskeletal disorder ($\beta_{log} = 0.32$, $p = 0.02$), the intensity of gastrointestinal symptoms ($\beta_{log} = 0.03$, $p = 0.02$) and the level of cardiac anxiety ($\beta_{log} = 0.32$, $p = 0.02$) were directly and significantly associated with persistent NCCP-related disability. Anxiety sensitivity ($\beta_{lin} = 0.50$, $p < 0.01$), panic disorder ($\beta_{lin} = 3.27$, $p = 0.01$) and history of cardiac disease ($\beta_{lin} = 3.09$, $p < 0.01$) were significantly associated with cardiac anxiety.

Conclusions: This study yielded a validated and simplified biopsychosocial model of the course of NCCP-related disability. It adds to the literature stating that multidisciplinary interventions may be needed to improve the health of patients with NCCP.

Abstract 1756

PSYCHOLOGICAL FACTORS AND NON-CARDIAC CHEST PAIN CASES AT CARDIAC EMERGENCY DEPARTMENT: LINK WITH TYPE D PERSONALITY AND ADVERSE MENTAL HEALTH STATUS

Erla Svansdottir, PhD, Department of medical psychology, Landspítali University Hospital, Reykjavík, NA, Iceland, Sesselja Hreggviðsdóttir, MS, Daniel T. Olason, PhD, Department of Psychology, Karl Andersen, PhD, Department of Medicine, University of Iceland, Reykjavík, NA, Iceland, Hrobjartur D. Karlsson, MD, Department of Cardiology, University Spitalzentrum Biel, Biel, NA, Switzerland

Purpose: Studies suggest that 60-80% of patients entering cardiac emergency departments (CEDs) receive a diagnosis of non-cardiac chest pain. The aim of this study was to explore the mental and physical health of patients attending a cardiac emergency departments with complaints of chest pains and to examine specifically whether, and then which psychological factors predict cases of non-cardiac chest pain (NCCP) among patients.

Methods: Participants included n=448 patients (M=52 years, SD=10 years; 264 (59%) men) who entered the National University Hospital of Iceland with chest pain. Participants answered questionnaires assessing somatic symptoms, depression, anxiety, perceived stress, exhaustion disorder and Type D (distress) personality, and background information.

Results: A total of 343 (68%) patients were categorized with NCCP and 105 (21%) patients were diagnosed with a coronary artery disease (CAD). An additional 60 (12%) patients with cardiac arrhythmias or other acute diseases were excluded from analyses. A comparison between groups revealed comparable scores among NCCP and CAD patients on somatic symptoms, depressive-, anxiety -, and burnout symptoms and similar prevalence of Type D personality. A logistic regression analysis assessing whether psychological measures would predict caseness of NCCP showed that Type D personality (OR=3.12; 95% CI:1.26-8.48; $p > 0.05$), gender (female; OR=3.49; 95% CI:1.86-6.85; $p < 0.001$) and age (OR=0.91; 95% CI:0.87-0.94; $p < 0.001$) were independent predictors of NCCP. Somatic symptoms, depressive symptoms, anxiety symptoms, health anxiety symptoms, perceived stress, exhaustion disorder and educational level were not significant predictors of NCCP caseness. NCCP patients with Type D personality had a greater somatic symptom burden, more depressive -, anxiety-,

health anxiety - and perceived stress symptoms, adjusted for gender, age and educational level. NCCP patients with Type D personality were also more likely to be classified with exhaustion disorder.

Conclusions: Interestingly, the prevalence of somatic symptom burden and psychological distress was similar between NCCP and CAD patients. However, Type D personality seems to predict NCCP caseness among patients with chest pain. The mental and physical health status of NCCP patients seems to be worse among patients who have a Type D personality.

Abstract 1625

EMOTION EXPRESSION IN RESPONSE TO MYOCARDIAL ISCHEMIA AND CARDIAC SYMPTOMS: ANALYSIS OF DIGITIZED VIDEO RECORDINGS OF THE FACE DURING CARDIAC STRESS TESTING

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Background: Psychological factors such as negative emotions have been associated with ischemic heart disease. Most research has focused on psychological factors as risk indicators of ischemic heart disease. However, it is also possible that myocardial ischemia (either symptomatic or asymptomatic) results in negative emotional states. Self-report methods that are typically used in psychological research can be influenced by cardiac and other physical symptoms. To circumvent potential biases related to self-report, the present study uses facial emotion expression analysis software to investigate the role of ischemia and anginal symptoms in emotion expression during cardiac stress testing.

Methods: Patients (N=256, mean age 66.8±8.7 yr, 43% women) were evaluated for inducibility of myocardial ischemia during clinically indicated cardiac stress testing (CST) using Single Photon Emission Computed Tomography (SPECT). Emotion expression was measured from digitized video recordings of the face and analyzed in four time blocks (baseline, initial CST phase, maximal CST, recovery). Emotion expressions of sadness, anxiety, anger, happiness were quantified as percentage per time block. SPECT images were evaluated for inducibility of ischemia.

Results: Cardiac stress testing induced ischemia in 89/256 (35%) of the patients. Ischemia was associated with higher levels of expressed sadness ($d=0.34$, $p=.017$) and low happiness ($d=0.30$, $p=.015$) during the initial CST phase. At maximal CST these differences became less pronounced, but both elevated sadness and low happiness were again observed in patients with ischemia during the recovery assessments ($d=0.37$ and 0.30 , resp., $p<0.05$). Anginal symptoms occurred in 85/256 (33%) patients and were equally prevalent in patients with (31%) and without (34%) inducible ischemia. Patients with both inducible ischemia and angina (N=28/256; 11%) displayed the highest expressions of sadness ($\eta^2=.042$, $p=.013$), and the lowest expressions of happiness ($\eta^2=.048$, $p=.006$) compared to the other patients undergoing CST.

Conclusion: Expressions of sadness and reduced happiness were more common in patients with ischemia. Anginal symptoms were also associated with more negative emotions. These findings suggest that ischemia and anginal symptoms both play a role in the (nonverbal) expression of negative emotions in patients with ischemic heart disease.

Abstract 1352

HOW TO ASSESS A TYPE D PERSONALITY EFFECT

Paul Lodder, MSc, Medical and Clinical Psychology, Tilburg University, Tilburg, Netherlands

Objective: In research on Type D personality, its subcomponents negative affectivity (NA) and social inhibition (SI) are hypothesized to have a synergistic effect on various medical and psychosocial outcomes. There exist different methods to include Type D personality as a variable in statistical analyses. The most commonly used method classifies people into either Type D or not Type D. As some methods used to assess a Type D effect have been criticized in the past, this study investigated the accuracy of five methods in detecting a Type D effect.

Method: We used a simulation and two empirical illustrations to investigate each method's performance (bias, power and false positives) in detecting the Type D effect.

Results: Our simulation showed that the most commonly used method to assess a Type D effect (using the Type D vs. not Type D variable) was primarily picking up the presence of NA or SI main effects, indicating that this method can falsely suggest a Type D effect. Moreover, this method failed to detect the *combined* presence of the NA and SI main effects, resulting in significant Type D effects when only one of the NA/SI main effects was present. The method that best detected a synergistic Type D effect included the continuous NA/SI main effects and their statistical interaction in a regression analysis. Reanalysis of two empirical Type D personality datasets confirmed the patterns found in our simulation.

Conclusion: This study showed that the Type D effect should be assessed with a continuous variable approach. If the Type D effect is synergistic, the focus should be on the interaction effect between NA and SI. If the Type D effect is additive, the focus should be on the NA and SI main effects. Other methods showed either more bias, more false positive findings or lower power. We recommend against using subgroup approaches to assess a Type D effect, as these methods are biased, regardless of whether the Type D effect is synergistic or additive in nature. Our results suggest that part of the Type D literature likely contains overestimated effects or false positive findings, highlighting the importance of reanalyzing all earlier work on Type D personality that did not assess the Type D effect with a continuous variable approach.

PAPER SESSION:

AFFECTIVE MODULATION OF PATHWAYS AND OUTCOMES

Friday, March 13 from 1:30 to 2:30 pm

Abstract 1314

DISPOSITIONAL EMPATHY AND AUTONOMIC REACTIVITY DURING A COMFORT INTERACTION

Alaina G. Tiani, M.S., Savanna Sparks, B.S., Francesca Folio, B.S., Kevin T. Larkin, Ph.D., Department of Psychology, West Virginia University, Morgantown, WV

Engaging in empathic behavior requires an individual to “put themselves in another’s shoes,” but doing so may have physiological consequences for empathic individuals. Numerous studies have examined the relation between empathy and autonomic response to emotions using various means for eliciting emotion; however, no consistent pattern of findings has emerged. The purpose of this study was to examine the association between dispositional empathy (DE) and autonomic reactivity (AR) during dyadic interactions among undergraduate women (N = 32). The primary research question was: do women higher in DE according to self-report exhibit differential AR patterns during a task in which they are asked to comfort another student in distress than those lower in DE? To expand on the work of previous studies that only used static emotion laden photos or videos, this study utilized an in vivo interaction between a participant and a confederate. Measures of heart rate, heart rate variability, and blood

pressure were recorded continuously while participants engaged in the emotion-evoking comfort task as well as a neutral comparison task. A 2 (Empathy Group: High, Low) x 2 (Task Type: Comfort, Neutral) mixed factors ANCOVA was conducted for each cardiovascular parameter, covarying resting measures, to determine whether there were significant differences in AR during the interactions between high and low empathy groups. Results revealed no significant main effect of Empathy Group (EG) for any of the cardiovascular measures. A significant interaction between EG and Task Type was detected for systolic blood pressure, $F(1, 29) = 4.54, p = .04, \eta_p^2 = .14$, as well as high frequency heart rate variability, $F(1, 29) = 4.92, p = .04, \eta_p^2 = .15$; however post-hoc simple main effects analyses revealed no significant mean differences between EGs. Analyses of observed behaviors showed that women in the high EG exhibited more social network support behaviors ($p < .04$), like offering to spend time with the confederate, and reported encountering the types of interactions used in this study ($p < .03$) more frequently than women in the low EG. Although findings failed to confirm study hypotheses, several methodological issues were uncovered that should be considered in future empirical work examining the impact of empathy on students pursuing careers in health science professions.

Abstract 1790

CROSS-CULTURAL DIFFERENCES IN EMOTIONAL INHIBITION AMONG PRESCHOOL-AGED CHILDREN

Elizabeth Ochoa Sierra, BA, Morgan Morrison, Bachelor's of Science, Edith Jimenez, Bachelor's of Art, Sara Bufferd, Ph.D, Kimberly D'Anna-Hernandez, Ph.D, Psychology, California State University, San Marcos, San Marcos, CA

Behavioral inhibition in childhood is associated with better mental health outcomes. However, cultural values relating to the ability to inhibit behavior may differ across ethnic groups. The construct of early behavioral inhibition has not been widely studied from a cross-cultural perspective. This project examines the differences in expressive emotional reactions between children of Mexican descent and White preschool-aged children. Values pertinent to Mexican and non-Hispanic populations differ and may contribute to emotional and behavioral differences among the populations. However, this theory has not been tested with young children completing a structured behavioral task. It is important to examine whether potential differences exist and whether such differences can impact mental health. It was hypothesized that children of Mexican descent ($n = 51$) would display less emotionality than White children ($n = 39$). Emotional reactions were assessed with a structured observational task from the Laboratory Temperament Assessment Battery (Lab-TAB). In the episode selected for this study, children were repeatedly criticized while being told to draw a perfect green circle. Typically, this episode elicits both positive and negative emotions. Here, positive affect, fear, sadness, and anger as expressed through facial, bodily, and vocal reactions were coded using a standardized coding scheme. An independent samples t -test was used to compare the difference in overall expressive affect between children of Mexican descent and White children. Consistent with our hypothesis, children of Mexican descent ($M = .63, SD = 2.37$) showed significantly less fear than White children ($M = 5.64, SD = 6.62$) $t(88) = 5.01, p < .01$. Additionally, children of Mexican descent ($M = 2.45, SD = 3.70$) expressed less anger than White children ($M = 5.54, SD = 6.07$) $t(88) = 2.98, p < .01$. Overall, this research may indicate that children of Mexican descent are less likely to visibly express emotions compared to White children. One possible explanation for these findings is that children of Mexican descent may be more likely to regulate and inhibit their emotional reactions in response to stress.

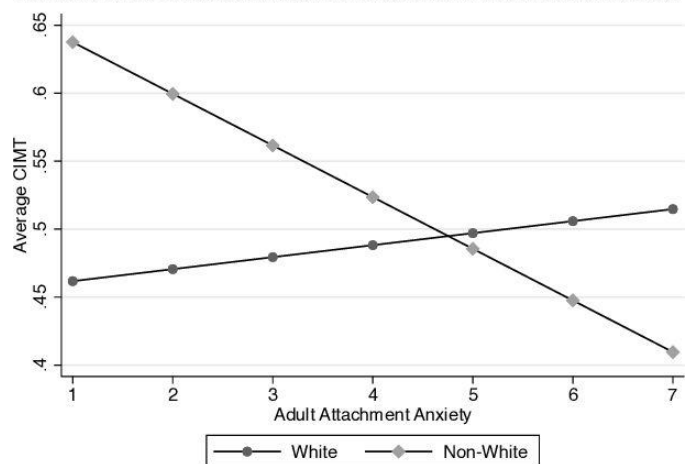
Abstract 1789

ADULT ATTACHMENT ANXIETY MODERATES THE ASSOCIATION BETWEEN RACE AND CAROTID INTIMA-MEDIA THICKNESS AMONG SEXUAL MINORITY MEN

Stephanie H. Cook, DrPH, Depts. of Social and Behavioral Sciences and Biostatistics, Erica Wood, MPH, Social and Behavioral Sciences, New York University, New York, NY

Sexual and racial minorities are at greater risk for cardiovascular disease (CVD) than heterosexual and racial majority individuals. A burgeoning body of research focuses on understanding how attachment to peers and romantic partners affects CVD risk. This research shows that having a more secure attachment style is associated with decreased CVD risk. However, most of this work has been conducted with samples lacking in racial and sexual orientation diversity. This is important to explore as the intersection of sexual orientation and race-related stigma may be associated with a poorer ability to form and maintain social relationships, which may, in turn, exacerbate the negative effects of minority stress on CVD risk. Thus, the current study uses an intersectional approach to explore racial differences in the association between adult attachment and CVD risk among young sexual minority men (YSMM). Fifty-one participants were recruited in a large urban city via snowball sampling. The mean age was 23.11 ($SD = 3.49$) and the sample was majority non-white (66.20%). A sonographer obtained B-mode images from four locations on each left and right common carotid arteries (CCA). An average CIMT measurement for was calculated by taking the mean measurement across the CCA images. The validated Experiences in Close Relationships Scale-Revised (ECR-R) scale was used to assess adult attachment (AA) avoidance (i.e. a need to distance oneself from peers/romantic partners) and AA anxiety (i.e. a preoccupation with being abandoned by peers/romantic partners). Linear regression analyses assessed the moderating effect of AA on the association between race and CIMT. All analyses controlled for age, race, body mass index (BMI), smoking status, and family history of a cardiac episode. Results indicated that AA anxiety moderated the association between race and CIMT ($b = -.043; se = .015, p = 0.006$). Non-white YSMM high on AA anxiety had lower CIMT than White YSMM high on AA anxiety. Further, non-White YSMM lower on AA anxiety (i.e., more secure) had higher average CIMT compared to White YSMM lower on AA anxiety. AA avoidance was not significant in any of the models. Our results suggest that having less AA anxiety may be protective for White YSMM, but not for Non-White YSMM. Future research should explore social factors that can help situate the findings.

The Moderating Effect of Adult Attachment Anxiety on the Association Between Race and Average CIMT



Abstract 1482**SLEEP AND FEAR EXTINCTION RECALL IN PTSD IMPROVES WITH MORNING BLUE LIGHT EXPOSURE THERAPY**

John R. Vanuk, M.A., *Psychology, Anna Alkozei, Ph.D, Anna I. Burns, B.A., Ayla D. Bullock, B.S., William S. Killgore, Ph.D, Psychiatry, University of Arizona, Tucson, AZ*

Disrupted sleep is a major feature in numerous clinical disorders and related to decrements in affective memory processing. The prevalence of sleep disruption in post-traumatic stress disorder (PTSD) is suggested to be a key feature that exacerbates the impaired ability to recall extinction memories during experimental fear conditioning for individuals with this disorder when compared to healthy controls. We hypothesized that an intervention employing blue-wavelength light therapy to regulate sleep and stabilize circadian rhythms in patients with PTSD (i.e., via regulated morning exposure) would be associated with improved consolidation and retention of extinction memories during a fear conditioning/extinction paradigm.

Thirty-eight individuals with PTSD (18 male; Age=30.8, SD=9.0) underwent a well-validated fear conditioning/extinction protocol with subsequent assignment to receive morning BLUE (469 nm; n=20) or placebo AMBER (578 nm; n=18) light therapy daily for 30-minutes over 6-weeks. Participants returned after the intervention for post-treatment extinction recall, comprised of exposure to the previously conditioned stimuli, with the difference in skin conductance response between the “extinguished” and the “never-extinguished” stimuli at follow-up calculated as Extinction Recall Magnitude (ERM). BLUE light therapy was associated with an increase in sleep duration relative to AMBER light ($p=.016$). Participants in the BLUE group sustained retention of the extinction memory, while those in the placebo AMBER group showed impairment, characterized by the restoration of the extinguished fear response after 6-weeks ($p=.016$). Improvement in sleep on the Insomnia Severity Index also correlated with the ERM for the BLUE ($r=.44$, $p<.05$) but not the AMBER group ($r=-.09$).

Daily BLUE-wavelength morning light exposure was associated with increased sleep duration and greater retention of extinction learning in patients with PTSD when compared to AMBER-wavelength light. We speculate that improved sleep facilitated by a stabilized circadian rhythm, after fear-learning, led to greater consolidation of the fear extinction memory. Prominent exposure treatments for PTSD incorporate principles of fear extinction, and our findings suggest that blue light treatment may help facilitate treatment gains by promoting the consolidation of extinction memories via improved sleep.

PAPER SESSION:

CAREGIVING, BEREAVEMENT, AND INFLAMMATION
Thursday, March 12 from 10:30 to 11:30 am

Abstract 1419**LONELINESS OF CANCER CAREGIVING GETS UNDER THE SKIN THROUGH INCREASED EXPRESSION OF PROINFLAMMATORY GENES**

Youngmee Kim, PhD, *Psychology, University of Miami, Coral Gables, FL, Steve Cole, PhD, Medicine, UCLA, Los Angeles, CA, Charles S. Carver, PhD, Michael Antoni, PhD, Frank Penedo, PhD, Psychology, University of Miami, Coral Gables, FL*

Background: Several studies have linked caregiving for a family member with chronic disease, mainly dementia, to various morbidities. Cancer caregiving is relatively acute yet intense. The effects of cancer caregiving on the development of physical morbidities remained understudied. The conserved transcriptional response to adversity (CTRA), characterized by increased expression of proinflammatory genes and decreased expression of antiviral genes, could potentially be a biological pathway for such effects. This study tested the associations of cancer caregiving with CTRA gene expression.

Method: Family caregivers of newly diagnosed colorectal cancer patients (51 years old, 72% female, 47% Hispanic, 33% spouse of the patient) completed questionnaires and provided blood samples around 3 (T1) and 12 months post-diagnosis (T2). Psychosocial factors analyzed included self-reported caregiving stress, loneliness, and social support. Blood samples were collected for assessment of a pre-specified CTRA indicator gene contrast at T1 (n=40) and T2 (n=38). Caregivers' age, gender/sex, ethnicity, BMI, smoking and heavy alcohol drinking status, and their patients' cancer stage served as covariates.

Results: Mixed linear models analyzing average expression of a 44-gene CTRA indicator score revealed positive associations with caregiving stress ($p=.0122$) and loneliness ($p=.0023$); and a negative association with social support ($p=.0473$). When the three psychosocial predictors were simultaneously tested, only loneliness ($p=.0172$) remained significant (with a near-significant additional contribution from caregiving stress; $p=.0543$). These associations were independent of demographic characteristics, BMI, smoking, and alcohol use status.

Conclusion: These findings suggest that alterations in CTRA gene expression might constitute one biological pathway through which lonely, stressed cancer caregivers become vulnerable to biological ill-health and premature aging. Future studies identifying unique correlates of loneliness, as opposed to those of lack of social support, are warranted. Given previous research linking eudaimonic well-being to reduced CTRA gene expression, meaning-centered interventions might constitute one potential approach for mitigating the adverse molecular profile observed in lonely, stressed cancer caregivers.

Abstract 1184**EFFECTS OF PSYCHOSOCIAL INTERVENTIONS AND CAREGIVING STRESS ON CARDIOVASCULAR BIOMARKERS IN FAMILY DEMENTIA CAREGIVERS: THE UCSD PLEASANT EVENTS PROJECT (PEP) RANDOMIZED CONTROLLED TRIAL**

Roland von Känel, MD, *Consultation-Liaison Psychiatry and Psychosomatic Medicine, University Hospital Zurich, Zurich, Switzerland, Paul J. Mills, PhD, Family Medicine and Public Health, Joel E. Dimsdale, MD, Psychiatry, Michael G. Ziegler, MD, Medicine, Matthew A. Allison, MD, Family Medicine and Public Health, Thomas L. Patterson, PhD, Sonia Ancoli-Israel, PhD, Psychiatry, Christopher Pruitt, BS, Family Medicine and Public Health, Igor Grant, MD, Brent T. Mausbach, PhD, Psychiatry, University of California San Diego, La Jolla, CA*

Background: This study examined whether biological mechanisms linking dementia caregiving with an increased risk of coronary heart disease can be modified by psychosocial interventions and which caregivers might benefit the most from an intervention. **Methods:** Spousal dementia caregivers were randomized to 12-week treatment with either a behavioral activation intervention (i.e., Pleasant Events Program PEP; n=60), or an active control Information and Support (IS; n=63) condition. Indicators of caregiving stress were assessed pre-treatment and circulating cardiovascular biomarkers were measured pre- and post-treatment. **Results:** There were no significant changes in biomarker levels from pre- to post-treatment both by treatment condition and across all caregivers. Regardless of the treatment condition, logistic regression analysis revealed that caregivers were more likely to show significant decreases in C-reactive protein (CRP) and D-dimer when their spouse had severe functional impairment; in interleukin (IL)-6 and CRP when they had greater distress due to care recipient's problem behaviors; in tumor necrosis factor (TNF)- α when they had higher levels of negative affect; and in IL-6, CRP, TNF- α and D-dimer when they had higher personal mastery. Within the PEP group, caregivers with higher negative affect and those with higher positive affect were more likely to show a reduction in von Willebrand factor and D-dimer, respectively. Within the IS group, caregivers whose spouse had severe functional impairment were more likely to show a decrease in IL-

6. Conclusions: Dementia caregivers high in burden/distress and resources may benefit from psychosocial interventions in terms of improved cardiovascular risk. These findings are valuable for precision medicine.

Abstract 1713

SLEEP PATTERNS, INFLAMMATION, GRIEF COPING, AND SEX DIFFERENCES THROUGHOUT THE FIRST YEAR OF BEREAVEMENT

E-Lim L. Wu, B.S., Ryan L. Brown, B.A., Christopher P. Fagundes, PhD, Psychological Sciences, Rice University, Houston, TX

Stressful life events and the negative emotions they generate promote immune dysregulation, disease, and premature mortality. Spousal bereavement, a particularly stressful life event, is characterized by poor sleep quality and symptoms of grief, which include strong negative emotions such as rumination and sadness related to the death. Within the first year of spousal bereavement, widow(er)s report poorer sleep quality compared to those who are not widowed. Poor sleep quality and night-to-night sleep variability are associated with elevated inflammation, an indicator of immune dysregulation, and a risk factor for heart disease. Though the associations between sleep and inflammation are well-established, little is known about *how* sleep patterns are characterized longitudinally in the first year of bereavement, *how* these patterns may differentially exacerbate immunological health and grief coping, and *who* may be more susceptible to maladaptive sleep patterns and negative health outcomes. For example, women exhibit greater vulnerability to the inflammatory effects of sleep disturbance. Thus, bereaved women may be at greater risk for poor mental and physical health if they exhibit maladaptive sleep behaviors. **Hypothesis:** We hypothesize that greater variability in sleep parameters (e.g., bedtime, sleep duration, time in bed, sleep efficiency, sleep quality) throughout the first year of bereavement, will be associated with elevated inflammation and poor grief coping. Women, compared to men, will exhibit poorer sleep quality and worse negative physical health outcomes (i.e., elevated inflammation) as a result of poor sleep quality. **Methods:** We followed 160 spousally bereaved individuals throughout the first year of bereavement (2, 4, 6 and 12 months post-loss). At each visit, blood was collected in the morning to evaluate proinflammatory cytokines; widow(ers) also answered-report questionnaires including the Inventory of Complicated Grief and Pittsburgh Sleep Quality Index. After each visit, participants completed a 7-day sleep diary. We will utilize random effect mixed models to test our hypotheses. This study will contribute to our understanding of the complex links between mental and physical health outcomes among widow(er)s.

Abstract 1665

SPOUSAL BEREAVEMENT AFTER DEMENTIA CAREGIVING: A TURNING POINT FOR IMMUNE HEALTH

Stephanie J. Wilson, PhD, Psychology, Southern Methodist University, Dallas, TX, Avelina C. Padin, MS, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH, Brittney E. Bailey, PhD, Statistics, Amherst College, Amherst, MA, Bryon Laskowski, BS, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH, Rebecca Andridge, PhD, Biostatistics, The Ohio State University, Columbus, OH, William B. Malarkey, MD, Internal Medicine, Janice K. Kiecolt-Glaser, PhD, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH

Losing a spouse can increase the risk for premature mortality, and declines in immune health are thought to play a role. Most of the supporting data have come from cross-sectional studies comparing already-bereaved individuals to matched controls, which provides valuable information about health disparities between groups but does not reveal health changes over time. Moreover, the health consequences of bereavement may be unique for dementia family caregivers, a large and growing segment of the population. The current

study sought to evaluate the course of health around 52 dementia spousal caregivers' bereavement by capturing lymphocyte proliferation to mitogens Con A and PHA and self-rated health before and after spousal loss. To investigate the moderating role of the social environment, we examined associations between social integration and health trajectories before and after spousal loss. Using piecewise linear mixed models to allow for turning points in caregivers' trajectories, we found that, for the average caregiver, lymphocyte proliferation to both mitogens weakened as bereavement neared and continued to decline after the loss, but at a slower pace. In tandem, perceived health degraded as bereavement approached but rebounded thereafter. Further, we found that socially isolated caregivers showed marked declines in immune responses to Con A and PHA over time both before and after bereavement, whereas their socially integrated counterparts had shallower declines to PHA and maintained a level immune response to Con A. In addition, socially isolated caregivers reported poorer health before and after bereavement compared to their socially integrated counterparts, whose self-rated health declined as the loss neared but later recovered to exceed prior levels. These findings shed new light on the dynamics of immune function in response to spousal bereavement after dementia caregiving: longitudinal data reveal a pattern of health recovery following caregivers' loss, particularly among those with more robust social networks prior to bereavement.

PAPER SESSION:

CHRONIC AND DAILY STRESS MEASUREMENT AND OUTCOMES

Saturday, March 14 from 3:15 to 4:30 pm

Abstract 1415

CHRONIC NEIGHBORHOOD SAFETY CONCERNS AND DAILY WELL-BEING: A NATIONAL DIARY STUDY

Jennifer Robinette, Ph.D., Psychology, Chapman University, Orange, CA, Jennifer Piazza, Ph.D., Public Health, California State University, Fullerton, Fullerton, CA, Robert Stawski, Ph.D., Human Development and Family Sciences, Oregon State University, Corvallis, OR

Background. People living in unsafe neighborhoods often report poor health. The reasons for this are multi-faceted, but one possibility is that unsafe neighborhoods create a situation of chronic stress, which may deplete people's resources to cope with daily stressors. How people respond to daily stressors (e.g., with increased self-reported negative affect and physical symptoms) is positively associated with health problems and may thus be one pathway linking perceptions of neighborhood safety to poor health. **Purpose:** The current study investigated the relationship between neighborhood safety concerns, daily stressors, affective well-being and physical health symptoms in a national sample of adults. **Methods:** Participants from the Midlife in the United States Study ($n = 1748$) reported perceived neighborhood safety and history of chronic stress exposure. Across eight days, they also reported their experience with daily stressors, physical symptoms and negative affect. **Results:** Greater neighborhood safety concerns were associated with higher negative affect and more physical symptoms, adjusting for other sources of chronic stress. Moreover, lower perceived neighborhood safety was related to greater increases in negative affect and physical symptoms on days that stressors were reported, even after taking into account established interactions between subjective daily stressors and other sources of chronic stress. **Conclusions:** Exposure to neighborhoods perceived as unsafe is associated with poorer daily well-being and exacerbated responses to daily stressors, which may serve as an individual-level pathway contributing to poorer health in neighborhoods perceived as unsafe.

Abstract 1796**THE STRESS OF THE DAY: A SYSTEMATIC REVIEW OF EVERYDAY STRESS AND CARDIOVASCULAR OUTCOMES**

Amanda K. Small, B.A., Matthew J. Zawadzki, PhD, Psychological Sciences, University of California, Merced, Merced, CA

Objective: Everyday stress is the most commonly experienced type of stress with the potential to impact cardiovascular health on a daily basis. Yet, everyday stress by definition concerns minor and frequent events that may not produce consistent physiological responses. More so, everyday stress is most commonly measured with ambulatory methodologies (e.g., ecological momentary assessment; EMA) in which there is no consensus for how to operationalize stress and when such measures should be deployed. To address these gaps, the current study presents a systematic review of the everyday stress literature to determine (1) if everyday stress reliably affects cardiovascular outcomes, and (2) to test if measurement methodology affects this relationship. **Methods:** The PsychInfo database was searched, and 36 unique studies with relevant data were identified. Inclusion criteria specified that everyday stress and cardiovascular outcomes must be directly measured in human participants and that the stress be naturalistic and not lab-induced. Cardiovascular outcomes were coded as blood pressure, heart rate, and heart rate variability. Everyday stress methodology was coded as using a retrospective survey, daily diary, or EMA. **Results:** Findings support a relationship between everyday stress and cardiovascular outcomes with more stress predicting more system arousal – increased blood pressure and heart rate measures and decreased heart rate variability. However, pronounced differences were seen across methodologies, with the majority of EMA and daily diary studies finding consistent relationships, while most retrospective survey studies did not. **Conclusions:** Everyday stress is typically understudied. Yet, this review found that it is both common and capable of evoking frequent and reoccurring cardiovascular responses indicating a critical focus for future research. Moving forward there is a pressing need to develop consistent means of measuring everyday stress and standardizing assessment protocols. Finally, an additional aim of the review was to explore whether chronically stressed or diseased populations showed heightened responses to everyday stress, yet too few studies included these populations making conclusions impossible. Future work should systematically study these individuals to explore potential vulnerabilities to everyday stress.

Abstract 1366**A NOVEL APPROACH TO CAPTURING WITHIN-PERSON FLUCTUATIONS IN EVERYDAY STRESS RESPONSES**

Meynard John L. Toledo, PhD, Department of Biobehavioral Health, Pennsylvania State University, University Park, PA, Stacey B. Scott, PhD, Department of Psychology, Stony Brook University, Stony Brook, NY, David Marcusson-Clavertz, PhD, Department of Psychology, Lund University, Lund, Sweden, Matthew J. Zawadzki, PhD, Psychological Sciences, University of California, Merced, CA, Martin J. Sliwinski, PhD, Center for Healthy Aging, Jilian A. Johnson, PhD, Joshua M. Smyth, PhD, Department of Biobehavioral Health, Pennsylvania State University, University Park, PA

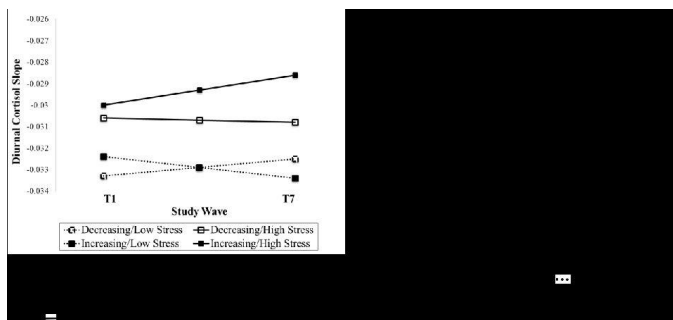
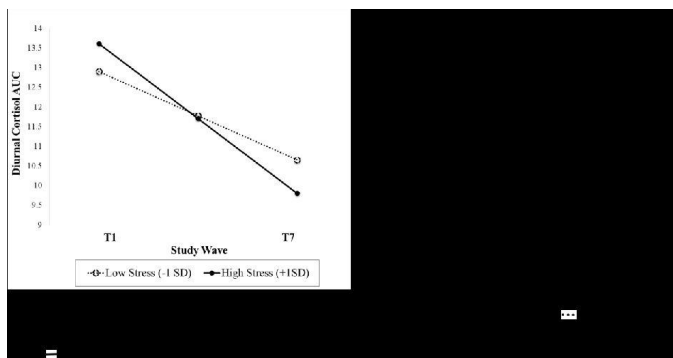
Maladaptive responses to everyday stressors can disrupt the enactment of health behaviors and lead to negative health consequences. Stress responses are highly variable within individuals, but we lack good methods to characterize moment to moment variation in stress responses. We developed a novel approach using ecological momentary assessment (EMA) to better capture within-person stress response components (i.e., Reactivity: the response following a stressor, Recovery: the return to baseline after a response, and Pile-up: the accumulation of stressors over time; or RRP) in everyday life. As a first step to determine the utility of this approach, we evaluated the proportion of variance in RRP attributed to (1) between-person, (2) within-person, between-days, and (3) within-person, within-day variation. Healthy adults ($n=123$; aged 35-65 ($M=46.8$; 79% women; 91% Caucasian) participated in a 14-day study assessing stress and momentary affective and cognitive states (to indicate stress

responding) via EMA six times a day; RRP were constructed from EMA reports. Multilevel models with moments nested within days, nested within persons were used to decompose variances in conventional indicators (i.e., affect, cognition, and stress), as well as the novel RRP measures. Consistent with prior work, conventional measures of momentary affective, cognitive, and subjective stress states reflected substantial between person differences ($M=44\%$), along with between-days ($M=14\%$) and within day ($M=42\%$) variance. As intended, the novel Reactivity and Recovery measures largely captured variance within-day (i.e., moment to moment; $M=80\%$), with minimal between-person ($M=9\%$) or between-day ($M=11\%$) variance. For Pile-up, most variation was due to differences between days ($M=56\%$), with the remainder between-person ($M=31\%$) and within-day ($M=13\%$). These results demonstrate that our RRP approach was superior to conventional EMA measures in capturing the dynamic within-person components of the stress response, particularly moment to moment variation in specific aspects of a stress response. Our goal is to implement this approach to better identify moments of vulnerability characterized by specific aspects (i.e., Reactivity, Recovery, or Pile-up) of maladaptive stress responding and to precisely deliver just-in-time interventions to reduce the negative effects of stress.

Abstract 1187**STRESS-RELATED TRAJECTORIES OF DIURNAL CORTISOL IN OLDER ADULTHOOD ACROSS 12 YEARS**

Heather Herriot, MA, Carsten Wrosch, PhD, Psychology, Concordia, Montréal, QC, Canada, Jeremy Hamm, PhD, Psychology, Concordia University, Montréal, QC, Canada, Jens Pruessner, PhD, Psychology, University of Konstanz, Konstanz, NA, Germany

Chronic stress can trigger cortisol dysregulation and create vulnerability towards poor health outcomes (Cohen, Janicki-Deverts, & Miller, 2007). These processes may be particularly important in the elderly population, a life phase when people frequently experience a host of age-related stressors, cortisol dysregulation, and physical disease (Heckhausen et al., 2019; Piazza et al., 2010). Less is known, however, about the conditions that link stress experiences with either hypo- and hyper-secretion of cortisol. One explanation for differential effects of stress on increased or reduced cortisol relates to the possibility that timing since the onset of stressors is inversely related to cortisol levels (Miller et al., 2007). However, the extant evidence lacks a longitudinal examination of changes in cortisol. We addressed this gap in the literature by predicting changes in cortisol slope and AUC by both levels and changes in stress over 12 years among older adults. Growth-curve modeling showed an effect of stress levels on the time slope of AUC, documenting that as compared to participants who reported low stress levels ($T\text{-ratio} = -5.32, p < .01$), their counterparts with high stress levels showed significantly steeper declines in cortisol levels over time ($T\text{-ratio} = -8.72, p < .01$). With respect to daily cortisol slopes, higher stress levels were on average associated with increasingly flatter cortisol slopes. In addition, an interaction between levels and changes in stress indicated that among participants with high and increasing stress levels over 12 years, cortisol slopes became increasingly flatter over time ($T\text{-ratio} = 2.73, p < .01$). By contrast, cortisol slopes remained relatively low and stable among participants with low stress levels regardless of changes in stress ($T\text{-ratios} = -1.01$ and $1.02, ps > .05$), or participants with high stress levels that decreased over the course of the study ($T\text{-ratio} = -0.42, p > .05$). The observed effects of stress experiences explained between 8% and 13% of the variance in cortisol change, and the results were independent of relevant covariates (i.e., age, sex, BMI, SES, smoking, cortisol medication). Implications for theory and research on the associations between stress and cortisol in aging populations are discussed.



Abstract 1496

HEART RATE AND BLOOD PRESSURE TRAJECTORIES DURING STRESS: A NEW SOURCE OF INTER-INDIVIDUAL VARIABILITY IN STRESS REACTIVITY

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Stressful experiences increase disease risk by provoking phenotypic changes in heart rate (HR) and blood pressure (BP). Methodologically, such changes are characterized by measuring HR and BP during both a baseline period and laboratory stressor and computing the difference in phase averages, yielding a single reactivity score. However, such characterizations fall short in reflecting the observation that stress responses are time-dependent and dynamic during mental stress. The current study aimed to characterize the continuous trajectory of HR during 10 minutes of mental stress and determine if individuals exhibit phenotypic HR trajectories. Young adults ($N = 177$, 146 females, $M(SD) = 18.03(0.43)$ years) completed a 10-minute baseline period and 10-minute socially evaluative mental arithmetic stressor while HR was continuously measured with a 3-lead electrocardiogram. Average HR was calculated on a minute-by-minute basis and modelled using group-based trajectory analysis. This approach identifies clusters of individuals who follow similar trajectories over time. Five distinct HR trajectories emerged from the data. One group exhibited a moderate initial response to stress (+15bpm) followed by a modest HR decline (-5bpm) over the stress period. Two groups mounted equally large increases in HR at the onset of the stress (+35bpm), but while one group maintained a high HR for the duration of the stressor, the other exhibited a sizable decrease (-20bpm) in HR as the stressor progressed. A fourth group exhibited very little initial reactivity but steadily increased in HR as the stress continued, ending roughly 12bpm above baseline. Finally, a fifth group showed no response at all, maintaining a HR equal to baseline for the duration of the stress task. These results demonstrate how cluster- and trajectory-based analytics can be used to explore novel sources of inter-individual variability; variability that may hold valuable insight into the connection between stress and disease.

PAPER SESSION:

CLINICAL CARDIOLOGY

Friday, March 13 from 10:45 am to 12:00 pm

Abstract 1677

THE PREDICTIVE VALUE OF EMERGENCY DEPARTMENT CROWDEDNESS FOR PTSD IN ACUTE CORONARY SYNDROME: A MACHINE LEARNING APPROACH USING QUANTILE RANDOM FORESTS

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Background: There are 633,000 hospitalizations for acute coronary syndrome (ACS) in the United States every year. Approximately 1 in 8 ACS patients develops elevated symptoms of posttraumatic stress disorder (PTSD) one month or later following the emergency department (ED) care. PTSD in ACS patients is associated with a higher risk of recurrent cardiovascular events and a higher mortality. An accurate, predictive model is needed to target strategies aimed at preventing the onset of PTSD following ACS in those most at risk. **Methods:** We conducted a prospective longitudinal cohort study of 764 consecutive patients with suspected ACS evaluated in an urban quaternary academic medical center ED. PTSD symptoms were measured using the PCL-S at 1, 6, and 12 months, with a PCL-S score ≥ 44 indicating probable PTSD diagnosis. Quantile random forest regression, a machine learning methodology, was used to predict probable PTSD and PTSD symptom severity at 1 month, 6 months and 12 months after ED admission. The predictor variables comprised of self-reported patient-level factors such as the early psychological response to ACS, sociodemographic characteristics, and objective factors of the ED environment extracted from the electronic medical record, such as ED crowding, operationalized by hourly occupancy rate. **Results:** The quantile random forest model predicted probable PTSD at 1 month with high discriminatory accuracy ($AUC=0.86$; sensitivity=.77, specificity=.73). Crowdedness was the most significant predictors for PTSD symptom severity at 1 month, 6 months and 12 months. The association between ED environment variables and PTSD was moderated by the early acute psychological response to the ACS event. **Conclusion:** This study shows that machine learning models may be useful for identifying ACS patients at risk for PTSD who could benefit from PTSD preventive interventions. Further, our machine learning models showed that objective data about the ED environment such as crowdedness yields important probabilistic information to forecast clinically relevant ACS-related PTSD symptoms at 1, 6 and 12 months. This suggests that interventions targeting the crowdedness of the ED may be beneficial for mitigating the risk of PTSD, and possibly other forms of psychological distress after ACS.

Abstract 1706

SOCIAL SUPPORT, PHYSICAL ACTIVITY AND TYPE A PREDICT SURVIVAL 15 - 25 YEARS AFTER FIRST CORONARY EVENT IN WOMEN WITH CORONARY ARTERY DISEASE - RESULTS FROM THE STOCKHOLM FEMALE CORONARY RISK STUDY

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Introduction: Behavioural and physiological risk factors are known to worsen prognosis of CAD in women. Social isolation, sedentary lifestyle and depression are psychosocial predictors of CAD in a short term follow up. We investigated whether these factors were associated in women with survival in a long run.

Methods: We examined 284 women (mean age 56 ± 7 y) with CAD from the Fem Cor Risk study. Their cardiac, behavioural and psychosocial risk profiles, exercise, smoking and dietary habits were assessed by standardized processes. The physiological mechanisms included a full lipid profile, the clotting cascade and autonomic dysfunction (HRV). The impact of physiological mechanisms was compared to standard risk factors. The impact of mortality was assessed in the national register, follow up period was 15 to 25 years.

Results: Using logistic regression for survival rates in 15-year time intervals, we could demonstrate the influence among social risk factors of age ($p=.002$) and a social class ($p=.03$), among standard coronary risk factors and unhealthy behaviour, of diabetes ($p=.02$), Apo B/Apo A ($p=.03$), sedentary life style ($p=0.002$) and waist-hip-ratio ($p=.002$). Type A behaviour ($p=0.007$) - but not depression - was a significant psychological predictor for mortality in women. From physiological mechanisms the total power as indicator of HRV ($p=0.001$) and from the coagulation cascade fibrinogen ($p=.04$) and v. Willebrand factor ($p=0.007$), but not CRP, were significant predictors. Reanalysing our study by means of boosted regression for survival times these findings could be confirmed and modified. The predictors were re-evaluated in two age classes. In addition we found in patients >55 years at the first coronary event as predictors for survival LV, DHEAS, social class, smoking, attachment and tangible in social support scales. Patients ≤ 55 y. showed exercise and cholesterol as predictors for survival.

Conclusion: The data confirmed our hypothesis of the influence of psychosocial risk factors for long term outcome in female CAD patients. In men and women, social class, social support, and exercise play an important role also in the long run. Interestingly, type A was different to men, beneficial for women. Coagulation and autonomic imbalance seem to be important mechanisms for the transition to coronary arteries. Exact survival-times can underscore results.

Abstract 1734

ASSOCIATION OF PSYCHOLOGICAL FACTORS WITH NON-CARDIAC CHEST PAIN PRESENTATIONS TO THE CARDIAC EMERGENCY DEPARTMENT AND EMERGENCY CENTRE IN ICELAND: IMPLICATIONS FOR PRIMARY HEALTH CARE UTILIZATION

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Objective: As chest pain is the main symptom of Coronary Heart Disease (CHD), a major contributor to mortality worldwide, reports of chest pain symptoms can cause major concerns to both patients and physicians. However, numerous patients present to hospitals each year with chest pain which has no cardiovascular related cause. Psychological factors can affect the interpretation of chest pain and influence health-care utilization. This study investigated the association of psychological factors with prevalence of non-cardiac related chest pain visits to hospitals, and the co-occurrence of non-cardiac chest pain visits and primary health-care contacts. **Method:** The sample included 390 patients (18-65 years, $M=52 \pm 11$) who presented with chest pain to the Cardiac Emergency or Emergency Department of Landspítali National Hospital, Iceland. Of these, 75% had no history of cardiovascular disease (representing non-cardiac chest pain patients (NCCP)) while 25% had documented CHD. Patients answered questionnaires assessing psychological factors 1-8 months post discharge. Medical history and health-care utilization was collected from medical files, dating 5-years pre- to 1-year post discharge. **Results:** In total, 92% of participants had

presented to the hospital with non-cardiac related chest pain. Of these, 24% of CHD patients and 34% of NCCP patients had two or more non-cardiac related chest pain visits. Prevalence of non-cardiac chest pain visits was positively correlated with somatic symptoms ($r=0.42$), depression ($r=0.40$), health anxiety ($r=0.22$) and number of contacts with primary care ($r=0.20$) in CHD patients, and somatic symptoms ($r=0.22$), anxiety ($r=0.15$), healthy anxiety ($r=0.33$) and number of contacts with primary care ($r=0.20$) in NCCP patients. In further adjusted regression analyses, depression ($\beta=0.34$) and somatic symptoms ($\beta=0.38$) in CHD patients, and health anxiety ($\beta=0.30$) and somatic symptoms ($\beta=0.23$) in NCCP patients, were associated with more non-cardiac related chest pain visits, independent of age, gender and other psychological factors (all p 's <0.05).

Conclusion: Prevalence of non-cardiac related visits was associated with various psychological factors in CHD and NCCP patients. Specifically, depression symptoms in CHD patients and health anxiety in NCCP were linked with more frequent non-cardiac chest pain visits in cardiovascular health services.

Abstract 1720

INVESTIGATION OF C-REACTIVE PROTEIN CUT-OFF LEVELS PREDICTIVE OF COGNITIVE DECREMENTS IN PATIENTS WITH STAGE B HEART FAILURE

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Stage B or pre- heart failure (HF), consists of patients with structural or functional cardiac changes, but do not exhibit symptoms of HF. Stage B HF is linked with substantial risk for developing symptomatic Stage C HF. More than half of patients who develop symptomatic Stage C HF develop cognitive impairment. Elevated levels of inflammation biomarker, C-reactive protein (CRP > 3 mg/L), predicts HF disease progression. Moreover, elevated CRP predicts cognitive impairment in various clinical populations. However, less is known about CRP levels predictive of cognitive decrements in patients with Stage B HF. **Methods.** Participants were 326 patients determined to have Stage B HF (age = 66.3 , SD = 9), recruited from VA and University of California, San Diego Healthcare Systems. All the participants had plasma CRP levels and Montreal Cognitive Assessments (MoCAs) obtained at baseline, and high-risk patients (B-type natriuretic peptide, BNP levels > 64 pg/mL, $n = 109$) had follow-up MoCAs obtained at 6- and 12- months. **Results.** 37% of Stage B patients met criteria for mild cognitive impairment (MCI) based on MoCA scores < 24 ; mean CRP = 4.7 mg/L, SD = 5 . Among all patients, analysis of variance (ANOVA) revealed MoCA scores differed across two CRP level categories: low (< 3 mg/L; $n = 187$) and high (≥ 3 mg/L; $n = 139$) $F(325,6)$ $p = .039$, adjusting for age, sex, BMI, and race. The high CRP group had lower MoCA scores (23.8 ; 95% CI $23.3 - 24.3$) than the low CRP group (24.6 ; 95% CI $24.1 - 25.0$). For high-risk Stage B patients, mixed-model analyses revealed a main effect of group ($F(86,1)$ 9.7 , $p = .002$, where the high CRP group ($n = 51$) had lower MoCA scores (23.5 , 95% CI $22.6 - 24.4$) than the low CRP group ($n = 55$) (25.5 , 95% CI $24.6 - 26.4$) across time, adjusting for multiple comparisons. There was no interaction effect of group \times time ($p = .47$). **Conclusion.** Cross-sectionally, among all Stage B HF patients CRP ≥ 3 predicted lower cognitive function; longitudinally, among patients at high risk for symptomatic HF, CRP ≥ 3 also predicted lower cognitive function. Determining CRP cut-off levels associated with cognitive impairment may lead to more focused targets of treatment to prevent cognitive decline in patients with Stage B HF.

Abstract 1384**ADOPTION AND EFFECTIVENESS OF AN EHEALTH INTERVENTION FOR HYPERTENSION IN OLDER ADULTS: A PILOT CLINICAL TRIAL**

Matthew F. Muldoon, MD, Julian Einhorn, BA, Danielle Burton, BS, Medicine, Taya Irizarry, PhD, Nursing, Daniel E. Forman, MD, Bruce Rollman, MD, Medicine, Thomas Kamarck, PhD, Psychology, Jonathan Yabes, PhD, Medicine, Lora Burke, PhD, Nursing, Brian Suffoletto, MD, Emergency Medicine, University of Pittsburgh, Pittsburgh, PA

Hypertension is uncontrolled in 50% of diagnosed adults in the US, particularly in association with older age. Home blood pressure monitoring (HBPM) can improve hypertension management by providing clinicians with reliable and up-to-date data on BP control, and by reinforcing patients' adherence to prescribed medications and other healthy behaviors. MyBP is a patient-facing HBPM aide that provides video-based education and supports BP self-monitoring with proactive, bidirectional, automated texting. Summary reports are routed to primary care providers. Here we examined the effectiveness of MyBP and the value of innovative ehealth technologies in older adults.

Non-demented, community-dwelling adults ≥ 55 y/o were recruited from primary care offices based on a diagnosis of hypertension, office systolic BP ≥ 150 mm Hg, and ownership of a cell phone. Enrollees were provided a standard automatic BP cuff and randomized 2:1 to MyBP vs no further intervention (control group). Engagement with MyBP was defined as submission of ≥ 4 of a maximum of 8 BP readings during each 2-week monitoring period. Study BP data were acquired independently of MyBP from all participants by single-blind, phone-supervised home BP measurements on 2 days at enrollment and on 2 days at trial completion. Trial duration median was 5 months.

Enrolled participants (N=62; 40 women, 33 Blacks, 38 without a college degree, mean age 66, mean office BP 164/91, mean # BP medications 2.6) were randomized to MyBP (41) vs. control (n=21). Six participants withdrew, all in the MyBP group, three who had never responded to MyBP prompts. In the MyBP group, engagement with HBPM averaged 82% throughout the 5-month period. Mean BP fell substantially in both groups and was similar at study completion (control=134.9/76.8 vs MyBP=130.5/80.5, p 's >0.10). At study completion, participants assigned to MyBP rated their confidence in BP measurement and management as higher ($p=0.016$), and their overall "heart health" as better ($p=0.037$), compared to control participants.

In this pilot trial of older adults with uncontrolled systolic hypertension, participants in the MyBP group reported improved perceived health and hypertension self-efficacy but did not achieve lower BP than those in the control group. The MyBP participants used the technology consistently, demonstrating effective engagement in an older population.

PAPER SESSION:**CURRENT DIRECTIONS IN HIV RESEARCH**

Thursday, March 12 from 10:30 to 11:30 am

Abstract 1456**INCREASING UPTAKE OF VOLUNTARY MEDICAL MALE CIRCUMCISION IN ZAMBIA: PRELIMINARY REGIONAL UPTAKE**

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Behavioral Sciences, University of Miami Miller School of Medicine, Miami, FL

Voluntary Medical Male Circumcision (VMMC) decreases the risk of HIV infection for men in Southern and Eastern Africa by up to 73% at 5.5 years post-VMMC without accompaniment of behavioral disinhibition (e.g., reduced condom use), and could avert 3.4 million HIV infections and 300,000 deaths over the next 10 years. Though the best HIV prevention option in areas of high HIV incidence and low VMMC prevalence such as Zambia, Zambian men have the lowest VMMC acceptability in sub-Saharan Africa. Thus, VMMC uptake in Zambia requires both demand generation and service provision. The Spear & Shield (S&S) intervention is a comprehensive VMMC demand creation program emphasizing that VMMC significantly reduces risk of HIV infection. In a clinical trial, S&S was 2.4 times more effective than the control condition and 8.5 times more effective than the observation-only condition at increasing VMMCs among Zambian men with no prior interest. This study describes the dissemination and implementation of the Spear & Shield 2 Program (SS2) to 300 community health centers (CHCs) across 4 Zambian provinces. SS2 provides CHCs in each province with both the S&S program and VMMC services (intervention) and compares them with CHCs offering only VMMC services (observation). A preliminary comparison of VMMC data over the 12 months prior to the study's start (historical data) with intervention site data and observation site data was conducted. SS2, which did not offer financial incentive for attendance, has been attended by $>33,000$ men and women; those attending the 4 S&S sessions receive a certificate. In a Stepped-Wedge Analysis to evaluate SS2 in the current 3 provinces, intervention clinics had significantly more VMMCs in comparison with both the historical period and the observation clinics. This effect did not differ between provinces, $\chi^2(2)=4.03$, $p=.133$. When SS2 ran in the clinics, each month resulted in greater numbers of VMMCs, $\chi^2(1)=4.72$, $b=0.041$, $SE=0.02$, $p=.03$. Intervention clinic VMMCs were 33% greater than observation clinic VMMCs and 22% greater than during the historical period, after accounting for CHC differences. Results suggest that CHC staff can be trained to effectively provide S&S and VMMC services, men and women are enthusiastic about attending S&S, and offering VMMC plus S&S appears to increase uptake of VMMC in comparison with VMMC alone.

Funding: R01MH095539

Abstract 1471**EFFECT OF CUMULATIVE BURDEN OF MENTAL HEALTH FACTORS ON ENGAGEMENT IN HIV CARE IN ARGENTINA**

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Background: The National AIDS Program in Argentina guarantees free access to HIV diagnosis, care, and treatment for people with or without health insurance coverage. Yet of the approximately 129,000 people living with HIV in Argentina in 2017, an estimated 80% had been diagnosed, 84% of those diagnosed were on antiretroviral therapy (ART), and only 68% of those on ART had a suppressed viral load of < 50 copies/mL. The cumulative burden of multiple mental health conditions may worsen physical health outcomes in vulnerable

populations. Accordingly, identifying cumulative burdens of mental health conditions that may affect HIV treatment and care can guide public health strategies to reduce their impact on HIV-related health outcomes. This study examined the contribution of cumulative burden of mental health conditions to factors associated with engagement in HIV care in Argentina.

Method: Participants ($N = 360$) were patients living with HIV who were lost to care, recruited from 7 clinics serving people living with HIV in 4 Argentine urban centers. The impact of the cumulative burden of mental health conditions (i.e., depressive symptoms, drug abuse, alcohol abuse, and perceptual anomalies) on patient-provider communication, self-efficacy, motivation for adherence, and viral load was assessed.

Results: Participants were men and women, 79% were white, 71% were heterosexual, and 56% were employed. The cumulative burden of mental health conditions did not differ between participant populations, though men were more likely than women to abuse drugs or alcohol. Overall, every 1-point increase in the number of mental health conditions present was associated with a decrement in patient-provider communication ($b = -0.22, p < .001$), self-efficacy ($b = -0.13, p = .007$), and motivation for adherence ($b = -0.12, p = .024$).

Conclusions: This study found cumulative burden of depression, drug abuse, alcohol abuse, and perceptual anomalies to negatively impact factors associated with engagement in HIV care. However, though individual burden factors have been associated with adherence, they were not associated with viral load, conceivably due to recent re-engagement in care to participate in the study. Results highlight the importance of identification and treatment of mental health challenges in order to ameliorate their influence on engagement in HIV care.

Funding: R01MH110242

Abstract 1106

AGING WITH HIV: INFLAMMATION IS ASSOCIATED WITH PAIN, POORER PHYSICAL FUNCTION, AND FRAILTY

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People living with HIV now have life expectancies similar to their HIV-negative peers, due to advances in antiretroviral therapies. Yet, they experience elevated multi-morbidity and aging-related syndromes that can compromise their quality of life. Drawing on links between inflammation and accelerated aging may inform interventions, but these links are understudied in older adults with HIV. We investigated cross-sectional relationships between inflammation, well-being, and geriatric syndromes among 161 HIV-positive older adults (mean age=61, SD=6). Participants provided fasting blood samples (for serum cytokines and CRP) and completed surveys (MOS-HIV; falls history) and cognitive (MoCA) and frailty assessments (using Fried criteria: grip strength, gait speed, exhaustion, low physical activity, and unintentional weight loss). Adjusted linear and logistic regression models tested relationships between inflammatory markers and age-related health outcomes, controlling for age, gender, BMI, race, and comorbidity burden. While 93% had suppressed HIV-1 viral load (< 200 copies/mL), 10% had CRP levels suggesting possible acute illness (>10 mg/L) and were excluded from analyses. Participants with higher IFN- γ reported greater pain ($p=0.001$), greater cognitive complaints ($p=.02$), and slightly worse physical function ($p=0.06$), than those with lower IFN- γ . Similarly, higher IL-6 levels were related to greater cognitive complaints ($p=0.03$) and worse physical function ($p=0.008$) but not significantly related to pain ($p=0.58$) in adjusted models. Compared to those with lower IL-6, those with higher IL-6 levels were also more likely to be frail ($p=0.04$). Conversely, CRP was not significantly related to these outcomes. Self-rated emotional well-being, falls in the past 6 months, and objective cognitive scores were not significantly related to the assessed inflammatory markers. Our

results illustrate key, expected links between inflammatory processes, frailty, physical function, and pain among older adults with HIV. As HIV researchers turn to addressing disparities in quality (vs. length) of life, strategies to reduce inflammation have the potential to mitigate age-related health declines among older adults with HIV. Alternatively, improving physical function, pain, and frailty components could limit inflammatory processes that drive excessive health risk in this group.

Abstract 1565

ATTITUDES TOWARDS TREATMENT, RACIAL DISPARITIES, AND SURVIVAL IN HIV OVER 17 YEARS

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Introduction: Very little has been done relating attitudes towards treatment (ATT) and survival. One study of 18,000 adults found skepticism towards medical care predicted mortality over 5 years. The purpose of this study was to determine whether ATT would predict survival in a diverse sample of people with HIV. A secondary purpose was to determine the extent to which there are racial disparities on ATT.

Methods: We used a 17-year longitudinal design. Participants were in the mid-stage of HIV (150-500 CD4s) at baseline with no prior AIDS-defining symptoms. Attitudes towards treatment (ATT) was measured at baseline by a 20 item questionnaire assessing a variety of treatment related attitudes and behaviors (e.g. towards doctors, medications, side effects, interacting with others, gaining information, and coping with information etc.) More "adaptive" attitudes yielded a higher score. Alpha is .813. Survival was assessed by deaths reported to the Social Security Death Master File in April 2014.

Results: Our sample of 177 PLWH was diverse: 70% male, 36% African American, 30% White, 28% Hispanic, 5% other. Whites scored significantly higher (mean=50.07, SD=6.61) on ATT than African Americans (43.04, SD=7.16), who scored similarly to Hispanics (44.46; SD=6.81). By 2014, 34% had died. Higher ATT predicted significantly lower mortality (Wald = 11.307, $p = .001$) controlling for biological covariates (age, CD4 and VL at baseline, antiretroviral medications). ATT remained a significant predictor (Wald = 5.25, $p = .022$) even after additional controls for demographics - gender, race, education and income. Those above the median on ATT were 2.14 times more likely to survive than those below the median. Interestingly, each of the demographic variables predicted survival controlling for biological covariates until ATT was added into the model, suggesting the importance of attitudes towards treatment in potentially explaining disparities in survival.

Conclusion: Attitudes towards treatment predicts greater survival among people living with HIV. Whites, African Americans and Hispanics were significantly different on this measure. Encouraging collaborative relationships with doctors, having a healthy relationship with information about HIV and treatment effects, and other aspects of ATT may help improve survival and reduce health disparities among ethnic/racial groups.

PAPER SESSION:

DEPRESSION, CARDIOVASCULAR DISEASE MORBIDITY, AND INTERVENTION PATHWAYS

Saturday, March 14 from 2:00 to 3:00 pm

Abstract 1299

8-YEAR DEPRESSIVE SYMPTOM TRAJECTORIES AND RISK OF INCIDENT STROKE: A 10-YEAR FOLLOW-UP OF THE HEALTH AND RETIREMENT STUDY (HRS)

Yenee Soh, S.M., Social and Behavioral Sciences, Henning Tiemeier, MD, PhD, Social and Behavioral Sciences, Epidemiology, Ichiro

Kawachi, MD, PhD, Social and Behavioral Sciences, Lisa F. Berkman, PhD, Social and Behavioral Sciences, Epidemiology, Global Health and Population, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Background

Evidence suggests a link between depressive symptoms and risk of subsequent stroke, however the majority of studies assess depressive symptoms at only one timepoint. The dynamic relationship between depressive symptom trajectories and risk of incident stroke is not well understood.

Methods

Data are from the Health and Retirement Study (HRS), an ongoing cohort of U.S. individuals aged >50 years. The sample included individuals who were stroke-free at study baseline, covering the 8-year period over which depressive symptoms were assessed (N=12,343). Depressive symptoms were measured at 4 consecutive timepoints biennially, using the 8-item Center for Epidemiologic Studies Depression scale (high defined as ≥ 3 symptoms; low < 3 symptoms). Individuals were assigned to pre-defined trajectories based on their scores at each timepoint (consistently low, decreasing, fluctuating, increasing and consistently high). Incident stroke was assessed over a subsequent 10-year period, based on self-reported doctors' diagnoses. Analyses were conducted with Cox proportional hazards models adjusted for demographics, health behaviors and health conditions.

Results

During follow-up, 1,419 incident strokes occurred. Individuals with consistently high depressive symptoms (fully adjusted HR: 1.21, 95% CI: 1.03–1.41), increasing symptoms (fully adjusted HR: 1.28, 95% CI: 1.06–1.56), and fluctuating symptoms (fully adjusted HR: 1.29, 95% CI: 1.06–1.58) all had higher hazards of stroke onset, compared with participants with consistently low symptoms. Individuals in the decreasing symptom trajectory group did not show increased stroke risk relative to those with consistently low symptoms (fully adjusted HR: 0.96, 95% CI: 0.78–1.20). No evidence for effect modification by sex or race was found.

Conclusions

Trajectories of depressive symptoms patterned by high levels of symptoms at multiple time points, were associated with increased stroke risk. However, a trajectory with depressive symptoms that started high but decreased over time was not associated with a higher risk of stroke. These findings suggest a single measure of high depressive symptoms may not adequately determine high risk of stroke. Given the remitting-relapsing nature of depressive symptoms, it is important to understand the relationship between depressive symptoms and stroke risk over time through repeated assessments.

Abstract 1730

ILLNESS SEVERITY AND DEPRESSION IN HOSPITALIZED PATIENTS WITH HEART FAILURE

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Studies of patients with heart failure (HF) have yielded conflicting data on the relationship between severity of illness and depression. Some suggest that the high prevalence of depression may be attributable to systolic dysfunction, but other studies have found no relationship between depression and the presence or severity of left ventricular dysfunction. Associations with the functional severity of HF have been more consistent, and there is growing interest in whether comorbidities contribute to the risk for depression as does the severity of HF per se. The current study compares the associations of these factors to depression in a series of multivariable models. Patients with heart failure (n=374; 50% women, 51% minorities, mean age 58 years) were enrolled during hospitalization at a university medical center. A sequential proportion odds model was used to test the relationships of three sets of variables (demographics and HF severity, comorbidities, depression history) to DSM-5 major and minor depression; least

squares models were fitted to continuous measures of depression. The first step in the DSM-5 model showed associations with younger age (b=-0.02; p=0.007) and NYHA class (b=0.64; p<.0001) but not with gender or left ventricular ejection fraction (LVEF). These effects held when medical comorbidities were added to the model, and an effect was found for renal disease (b=0.64; p=.007) but not for other comorbidities. These effects held in the third step when past history of major depression (b=0.69; p=.003) and current antidepressant medications (b=0.82; p=.0008) were added to the model. Similar results were obtained in least squares regression models of scores on the Patient Health Questionnaire (PHQ-9) and the Hamilton Rating Scale for Depression (HAM-D-17), although renal disease was nonsignificant and sleep apnea was significant in the full PHQ-9 model, and neither comorbidity was significant in the HAM-D-17 model. These results are consistent with previous findings that patients with HF who are relatively young, moderately-to-severely impaired by their heart disease, or affected by major medical comorbidities are vulnerable to depression. They are inconsistent with findings linking systolic dysfunction to an increased risk for depression.

Abstract 1288

DIFFERENCES IN THE PREVALENCE OF SCREEN-DETECTED DEPRESSION AFTER ACUTE CORONARY SYNDROME ACROSS 4 HEALTH SYSTEMS IN THE UNITED STATES: FINDINGS FROM THE CODIACS-QOL TRIAL

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Background: In CODIACS-QoL, a multi-health system RCT of depression screening in acute coronary syndrome (ACS) patients, universal depression screening and notification of treating clinicians of positive depression screens with or without provision of enhanced depression care (N=1000) did not improve quality of life or depressive symptoms compared to no depression screening (N=500). Overall, only 8% of patients screened positive for depression 2-12 months after ACS. We sought to determine if there were differences in the prevalence of screen-detected depression between health systems, and whether these differences could be attributed to differences in patient characteristics.

Methods: Electronic health records were screened to identify individuals with ACS who were eligible for depression screening; patients with a past history of depression or current receipt of mental health treatment were excluded. The telephone-administered PHQ-8 was used to screen for depression; PHQ-8 score ≥ 10 indicated a positive screen. Logistic regression was used to assess the association between health system and screen-detected depression, with and without adjusting for patient demographics and physical health.

Results: The prevalence of screen-detected depression was 0.5% (1 of 202) at HealthPartners, Minneapolis, MN; 6.0% (21 of 348) at Kaiser Permanente, Portland OR; 10.2% (43 of 421) at Columbia-NYP, New York, NY; and 20.7% (6 of 29) at Duke University Health System, Durham, NC. Health system was associated with screen-detected depression, even after controlling for patient characteristics (**Table**). Older age and better physical health were also associated with lower odds of screen-detected depression in the adjusted model.

Discussion: There was substantial heterogeneity in the prevalence of screen-detected depression in ACS survivors between health systems that was not explained by differences in the measured characteristics of health system populations. The prevalence of screen-detected depression should be assessed before implementing systematic depression screening programs, as low detection rates may reduce the potential for cost-effective depression screening. Future studies should

seek to understand the reason for health system differences in screen-detected depression and whether novel approaches to depression screening are needed to accurately screen for depression.

Table. Association between Health System and Odds of Screen-Detected Depression in the CODIACS-QoL Trial (N=1,000)

	Model 1 Unadjusted OR, 95%CI	P- value	Model 2 Adjusted OR, 95%CI	P- value
Health system				
Duke (Durham, NC)	2.28, 0.81-5.60	0.09	2.88, 0.86-8.81	0.07
Kaiser (Portland, OR)	0.57, 0.32-0.96	0.04	0.76, 0.36-1.61	0.47
HealthPartners (Minneapolis, MN)	0.04, 0.002-0.20	0.002	0.09, 0.005-0.48	0.02
Columbia-NYP (New York, NY)	1 (referent)		1 (referent)	-
Age, per year increase			0.95, 0.93-0.98	<0.001
Male			0.64, 0.35-1.17	0.14
Ethnicity				
Hispanic			1.25, 0.48-3.18	0.64
Declined			1.31, 0.07-8.20	0.81
Non-Hispanic			1 (referent)	-
Race				
Black			1.39, 0.56-3.29	0.47
Other			1.76, 0.78-3.93	0.17
White			1 (referent)	-
Born outside the US			1.30, 0.50-3.06	0.57
First language English			2.51, 0.74-8.18	0.13
Married			0.97, 0.54-1.75	0.91
Education				
College or higher			0.60, 0.30-1.16	0.13
Some college			0.67, 0.32-1.33	0.26
Less than college			1 (referent)	-
Employed			0.67, 0.34-1.29	0.23
Problem affording health care			1.20, 0.46-2.80	0.69
Physical health, per point increase (SF-12 Physical Composite Scale)			0.95, 0.93-0.97	<0.001

PAPER SESSION:
DEPRESSIVE SYMPTOMS AND CARDIOMETABOLIC RISK
Thursday, March 12 from 11:45 am to 12:45 pm

Abstract 1451
SYNERGISTIC ASSOCIATIONS OF DEPRESSIVE SYMPTOMS AND EXECUTIVE FUNCTIONS WITH LONGITUDINAL TRAJECTORIES OF DIABETES BIOMARKERS AMONG URBAN DWELLING ADULTS WITHOUT DIABETES

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Background: Already known as common consequences of diabetes, depressive symptoms and executive functions (EF) have emerged as novel risk factors for diabetes onset. However, it is unclear how depressive symptoms and EF interact to influence diabetes incidence across the lifespan. Consequently, we examined synergistic associations of depressive symptoms and EF with longitudinal trajectories of diabetes biomarkers among middle-aged and older adults without diabetes at baseline.

Methods: Participants were 1,574 African American (AA) and White, urban-dwelling adults (mean (SD) age at baseline = 46.8 (9.3) years, 58% female, 57% AA, 40% living in poverty) from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study who were assessed on up to 3 time points over a 13-year period (2004-2017). Participants completed the Center for Epidemiological Studies-Depression (CES-D) scale and measures of EF – Trails Making B, verbal fluency and Digits Backwards – at baseline, and provided blood samples at each time point for measurement of glycated hemoglobin (HbA_{1c}) and fasting glucose. EF measures were z-transformed and combined into a composite EF value.

Results: Linear mixed effects regression models estimating interactive relations of depressive symptoms and EF on age-related change in HbA_{1c} and fasting glucose and adjusting for age, race, sex, poverty status, and literacy revealed significant three-way interactions of CES-

D, EF, and age on change in HbA_{1c} ($B = -.0001, t(2933) = -2.3, p = .02$) and in fasting glucose ($B = -.003, t(2715) = -2.3, p = .02$), such that among individuals with low EF, greater depressive symptoms were associated with the greatest increase in HbA_{1c} and fasting glucose, respectively, across time points. Age, AA race, and literacy predicted change in HbA_{1c} (all $ps < .01$) while age, and male sex predicted change in fasting glucose (all $ps < .001$) across time points.

Conclusions: These findings suggest that depressive symptoms and lower EF may interactively accelerate trajectories of diabetes biomarkers thereby increasing risk for earlier diabetes incidence. Implications for screening of adults in this high-risk group for earlier intervention warrants further study.

Abstract 1691
DEPRESSIVE SYMPTOMS ARE ASSOCIATED WITH CARDIAC FUNCTION AMONG HISPANICS: RESULTS FROM THE PREVENCIÓN STUDY

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Background: Depressive symptoms are common among patients with heart failure and are often associated with adverse outcomes, including re-hospitalization rates and mortality. However, little is known about the association between depressive symptoms and cardiac function in pre-clinical or community-based samples, and no study to date has focused on Andean Hispanics. In this study, we examined the cross-sectional association between depressive symptoms and cardiac function in Andean Hispanic community-based adults.

Methods: Participants included 527 adults (57.1% female, mean age=51.0, SD=16.7) enrolled in the Peruvian Study of Cardiovascular Disease (PREVENCIÓN). Depressive symptoms were assessed with the Hospital Anxiety and Depression Scale (HADS). Markers of cardiac function were assessed by impedance cardiography and included cardiac output, cardiac index, stroke volume, and stroke volume index. Multiple regression models were used to examine the association between depressive symptoms and markers of cardiac function.

Results: Mean depressive symptom scores were 5.7 (SD=3.5). Depressive symptoms were associated with reduced cardiac output ($\beta=-0.200, p<0.001$), cardiac index ($\beta=-0.161, p<0.001$), stroke volume ($\beta=-0.194, p<0.001$), and stroke volume index ($\beta=-0.154, p=0.001$) in unadjusted analysis. After controlling for demographic (age, gender, education) and cardiovascular risk factors (smoking, body mass index, low- and high-density lipoprotein cholesterol, triglycerides, fasting glucose, diabetes mellitus, and serum creatinine), depressive symptoms remained independently associated with cardiac output ($\beta=-0.106, p=0.013$), cardiac index ($\beta=-0.099, p=0.030$), and stroke volume ($\beta=-0.091, p=0.028$). A trend was observed in the association between depressive symptoms and stroke index ($\beta=-0.077, p=0.083$).

Conclusions: Depressive symptoms are independently associated with cardiac function among Andean Hispanic adults. Future studies should determine whether depressive symptoms are prospectively associated with systolic dysfunction, and examine the bio-behavioral pathways involved in this association.

Abstract 1494
CARDIOMETABOLIC RISK ASSOCIATED WITH LIFETIME PTSD AND DEPRESSION IN THE HEALTH OF VIETNAM ERA WOMEN'S STUDY (HEALTHVIEWS)

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Background: Stress-related mental health conditions such as posttraumatic stress disorder (PTSD) and major depressive disorder (MDD) can have negative implications for health, including increased risk for cardiovascular disease (CVD). However, these associations are understudied among older women. We examined associations between both PTSD and MDD and cardiometabolic-related risk—obesity, hypertension, and CVD—in the Health of Vietnam-Era Women's Study (HealthViEWS).

Methods: 4219 women veterans ($M_{age}=68$) who were active duty during the Vietnam era stationed in Vietnam (VN; $N=1956$), near Vietnam (NV; $N=657$), or in the U.S. (US; $N=1606$) completed a mail survey and telephone interview. Participants reported on diagnosed health conditions, including angina or coronary artery disease, congestive heart failure, myocardial infarction, stroke/transient ischemic attack, and other CVDs, as well as hypertension. Current obesity was determined from self-reported height and weight. Lifetime PTSD and MDD were assessed using the Composite International Diagnostic Interview. Multivariable logistic regression analyses examined associations linking PTSD and MDD with cardiometabolic outcomes, with adjustment for military service characteristics, demographics, current smoking status, and alcohol abuse.

Results: 33% of the total sample had been diagnosed with a CVD, 56% had been diagnosed with hypertension, and 37% were obese. The VN cohort showed significantly higher prevalence for coronary artery disease, other cardiovascular conditions, and any CVD relative to the NV and US cohorts. With adjustment for demographics, wartime location and other service characteristics, and smoking and alcohol abuse, lifetime MDD was associated with increased risk for any cardiovascular condition ($OR=1.23$), hypertension ($OR=1.21$), and obesity ($OR=1.30$). Lifetime PTSD was associated with increased risk for any cardiovascular condition ($OR=1.55$) and obesity ($OR=1.20$).

Conclusions: In addition to serving in Vietnam (relative to NV or US service), study results suggest that PTSD and MDD are associated with increased cardiometabolic risk in Vietnam Era women veterans. These findings highlight the importance of examining the health effects of stress and related mental health conditions across the life course, especially in this understudied population of older women who served during the Vietnam Era.

Abstract 1492

DEPRESSIVE SYMPTOMS MEDIATE THE RELATIONSHIP BETWEEN DISPOSITIONAL MINDFULNESS AND DIET QUALITY AMONG HEALTHY MIDLIFE ADULTS

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Background: Emerging evidence suggests that mindfulness, a practice of non-judgmental awareness of present experience, may reduce eating psychopathology and emotion-driven eating. However, few studies have explored the relationship between dispositional mindfulness and diet quality or sought to identify factors that mediate the effect of dispositional mindfulness on diet quality.

Methods: Community-dwelling midlife participants ($N=406$; $M_{age}=43.19$, $SD=7.26$; $M_{BMI}=27.08$, $SD=5.28$; 52% female) reported dispositional mindfulness using the Mindful Attention

Awareness Scale, depressive symptoms using the Center for Epidemiological Studies Depression Scale, and perceived stress using the Perceived Stress Scale. Dietary intake was assessed using the Block Food Frequency Questionnaire, from which the 2015 Healthy Eating Index (HEI) was derived. Direct and mediating effects of dispositional mindfulness, depressive symptoms, and perceived stress on overall HEI scores were analyzed using the mediation package in R with bias-corrected bootstrapped confidence intervals (BootCI). Age, sex, education and BMI were entered as covariates in all models.

Results: Higher dispositional mindfulness was associated with higher diet quality ($\beta=0.095$, $p=0.04$). Depressive symptoms significantly mediated the relationship between dispositional mindfulness and overall diet quality (average causal mediation effect [ACME]=0.6962, $BootCI=0.104-1.42$, $p=0.03$) such that higher mindfulness was associated with higher overall diet quality through lower depressive symptoms. Perceived stress was significantly negatively correlated with dispositional mindfulness ($\beta=-0.310$, $p<0.01$) but was not related to diet quality ($\beta=-0.039$, $p=0.44$) and therefore did not mediate the relationship between mindfulness and diet quality (ACME=0.173, $BootCI=-0.261-0.65$, $p=0.46$).

Conclusions: These cross-sectional data provide initial evidence that dispositional mindfulness may relate to diet quality among midlife adults, an effect that may be explained in part by lesser depressive symptomatology. Given that lifestyle behaviors in midlife are leading determinants of risk for cardiovascular and neurocognitive disease in late life, interventions targeted at enhancing mindfulness in midlife may plausibly mitigate disease risk. Additional research assessing the impact of mindfulness interventions on diet quality are warranted.

PAPER SESSION:

DEPRESSIVE SYMPTOMS AND INFLAMMATION Thursday, March 12 from 4:15 to 5:30 pm

Abstract 1581

AGE, DEPRESSIVE SYMPTOMS, AND ANTIBODY PRODUCTION FOLLOWING INFLUENZA VACCINATION

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Depressive symptoms are associated with impaired adaptive immunity, including dampened antibody production following vaccination (Bennett & Cohen, 1993). This research has been conducted mostly with older adults, and there is mixed evidence in younger samples (Weisse, 1992). Moreover, research has not explored how changes in depressive symptoms over a year might shape changes in antibody production. This study extends the literature in two ways. First, we examined whether age moderated the link between depressive symptoms and antibody production following vaccination across two consecutive flu seasons. Second, we explored whether changes in depressive symptoms across the year predicted changes in antibody production and whether this pattern differed by age.

Adults ($n=102$, $M_{age}=42.5$ yrs, range 18-80 yrs) participated in two years of data collection during the 2017-18 (Y1) and 2018-19 (Y2) influenza seasons. Participants completed two study visits each year. At Visit 1, participants reported on their depressive symptoms, provided blood samples, and received the flu vaccine (FluZone). Four weeks later, participants provided a second blood sample. Hemagglutination inhibition (HAI) antibody titers were examined pre- and post-vaccination. For each strain, we corrected for pre-vaccination antibodies (Beyer et al., 2004). We used these corrected values to form a standardized composite score of all four strains representing general vaccine response (Segerstrom et al., 2012).

First, we tested whether age moderated the association between depressive symptoms and antibody production four weeks post-vaccination within each year. For both Y1 and Y2, neither depressive symptoms nor the interaction with age were significant (see Tables 1 and 2). Second, we tested whether age moderated the association between change in depressive symptoms and antibody production.

Here, the interaction was significant ($p < .01$; see Table 3). Older adults who became less symptomatic from Y1 to Y2 showed an increase in antibody production in Y2, controlling for Y1 levels, but this effect was not significant for younger adults. These analyses show that reductions in depressive symptoms were associated with corresponding increases in antibody production for older adults. This study illustrates new insights that can be gained when participants complete multiple vaccine challenges over time.

Table 1: Age \times Depressive Sx on Y1 Ab Production

Predictors	β	t	p
Constant	0.873	1.644	0.102
Depressive Sx	-0.269	-0.861	0.39
Age	-0.022	-2.142	0.034
Age \times Depressive Sx	0.008	1.266	0.207

Table 2: Age \times Depressive Sx on Y2 Ab Production

Predictors	β	t	p
Constant	-0.206	-0.327	0.744
Sex (M = 0, F = 1)	-0.37	-2.54	0.013
Depressive Sx	0.28	0.724	0.471
Age	0.007	0.478	0.634
Age \times Depressive Sx	-0.006	-0.664	0.509

Table 3: Age \times Change in Depressive Sx on Y2 Ab Production

Predictors	β	t	p
Constant	0.047	0.281	0.779
Sex (M = 0, F = 1)	-0.518	-3.886	<0.001
Y1 Ab Production	0.449	3.514	<0.001
Change in Depressive Sx	0.471	2.42	0.018
Age	0.005	1.283	0.203
Age \times Change in Depressive Sx	-0.013	-2.917	0.005

Note. Change in depressive symptoms measured as the standardized difference between Y2-Y1 symptoms. Positive scores indicate that participants had more symptoms at Y2 than at Y1.

Abstract 1272

PERIPHERAL INFLAMMATORY SIGNALING IS ASSOCIATED WITH DISTINCT REWARD-RELATED BRAIN FUNCTION IN INDIVIDUALS WITH VS. WITHOUT A DEPRESSION HISTORY

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Background: Human and animal research indicates that elevated peripheral inflammation is linked with altered reward-related brain function. In a separate literature, reward-related neural abnormalities also have been found in current depression and extended to individuals with vs. without a history of depression. Given a distinct reward profile among individuals with a history of depression, it is possible that the association between inflammation and reward-related brain function

differs by a history of depression. However, research investigating this question is sparse. To address this issue, the present study examined the association between peripheral inflammation and reward-related neural activation among individuals with vs. without a history of depression. **Method:** Complete data were available from a demographically diverse subset ($N=79$; $M_{\text{age at scan}}=18.33$ years; 60% female) of participants in a longitudinal study examining risk for the development of depression. Participants were dichotomized into Depression History (DH) and No Depression History (NDH) groups using the Kiddie Schedule for Affective Disorders and Schizophrenia interview. The Card Guessing fMRI task was administered to assess activation in two a priori regions of interest during monetary reward anticipation, the nucleus accumbens (NAcc) and orbitofrontal cortex (OFC). Blood was collected via antecubital venipuncture and assayed for inflammatory proteins, IL-6, IL-8, TNF α and C-reactive protein. To measure inflammatory signaling, an inflammation composite score (ICS) was generated from these measures. Gender, number of days between the scan and blood draw, and current medication use were included as covariates. **Results:** Hierarchical linear regressions revealed a significant interaction between depression history and ICS for activation in the OFC ($b=-.226$, $p=.004$, $\Delta R^2=.107$) and NAcc ($b=-.296$, $p=.030$, $\Delta R^2=.064$) during reward anticipation. Specifically, within the DH group, a higher ICS was associated with *less* OFC and NAcc activation. However, within the NDH group, higher ICS was associated with *more* OFC activation, with no difference in NAcc activation. **Conclusion:** Reward-related brain function is related to peripheral inflammatory activity in a differential manner depending on a history of depression, with implications for intervention targets for inflammation-associated depression.

Abstract 1801

PARENTAL DEPRESSIVE SYMPTOMS AND CHILD ANTIBODY RESPONSE TO INFLUENZA VACCINATION

Aishat Sadiq, BA, Kelsey Corallo, MS, Sarah Lyle, MS, Deborah Bastien, MBMS, Isabel Wasilewski, BS, Katherine Ehrlich, PhD, Psychology, University of Georgia, Athens, GA

Parental mental health has been associated with a range of negative outcomes for children (e.g., Smith, 2004). For example, parental psychiatric symptoms have been linked to child immune system functioning (Caserta et al., 2008), and some evidence suggests that in particular, parental depressive symptoms may be related to poor physical health in childhood (e.g., Wolf, Miller, & Chen, 2008). The current study explored whether parental depressive symptoms are associated with children's antibody response to influenza vaccination. We predicted that greater parental depressive symptoms would be associated with dampened antibody response.

Child participants ($n = 148$; $M_{\text{age}} = 14.6$, $SD = 1.6$) and a parent completed two study visits. At the first visit, parents and children completed questionnaires, and children provided a blood sample and were administered the 2018-2019 inactivated influenza vaccine. Approximately 28 days later, children provided a second blood sample. Hemagglutination inhibition (HAI) antibody titers were examined pre- and post-vaccination. Standard correction methods (Beyer et al., 2004) were used to control for baseline antibodies. Parental and child depressive symptoms were measured via the Center for Epidemiological Studies – Depression questionnaire (CES-D; Radloff, 1977).

Regression analyses evaluated the association between parental depressive symptoms and antibody response to each of the four strains included in the vaccine, as well as a standardized mean composite of all strains (Table 1). Parental depressive symptoms were negatively associated with children's antibody response to the B/Phuket strain and was suggestive for being negatively associated with the composite of all strains ($p = .065$). However, there was no association between parental depressive symptoms and the other strains. Of note, the links between parental depressive symptoms and children's antibody production remained unchanged when controlling for children's depressive symptoms.

These findings suggest that greater parental depressive symptoms are related to dampened antibody response to influenza vaccination in childhood, providing further evidence for the importance of parental mental health in child health outcomes.

Table 1

<i>Regression Analysis Summary of Parental Depression on Child Ab Production</i>			
Variable	β	SE	p
A/H1N1 (n = 139)	-0.085	0.339	0.315
A/H3N2 (n = 144)	-0.092	0.27	0.273
B/Phuket (n = 146)	-0.169	0.247	0.041
B/Colorado (n = 147)	-0.103	0.284	0.212
All strains composite (n = 147)	-0.152	0.171	0.065

Abstract 1300

DEPRESSIVE SYMPTOMS, DAILY POSITIVE EVENTS, AND INFLAMMATION: TESTS OF BUFFERING VERSUS BLUNTING HYPOTHESES

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Previous research has linked depressive symptoms and daily positive events to higher and lower levels of inflammation, respectively. However, the possible moderating effects of daily positive events on the association between depressive symptoms and inflammation remain unclear. The buffering hypothesis suggests that the association between depressive symptoms and inflammation will be reduced among people with more positive events, whereas the blunting hypothesis suggests that the link between daily positive events and lower inflammation will only be observed among those with lower depressive symptoms. The purpose of the study was to test two competing hypotheses (buffering vs. blunting) regarding the interaction between depressive symptoms and daily positive events on inflammatory markers. Using data from the Midlife in the United States Refresher Study, the sample of 343 adults ages 25-75 (55% women, 83% white) completed daily diary telephone interviews for 8 evenings about their daily positive events and affect. Depressive symptoms were assessed with the 20-item Center for Epidemiological Studies Depression Scale, and blood samples obtained at a clinic visit were assayed for inflammatory markers interleukin-6 (IL-6) and C-reactive protein (CRP). On average, depression scores ranged from 0 to 44 (mean = 9.31 indicating non-clinical depressive symptoms, SD = 7.80), and participants reported a mean of 1.25 (SD = .70) positive events per day (range: 0-5). In a model controlling for age, sex, race, and mean daily positive affect, depressive symptoms predicted elevated log IL-6 and CRP, and more frequent daily positive events were associated with lower log IL-6 and CRP. These main effects were modified by an interaction between depressive symptoms and positive events, such that daily positive events predicted lower IL-6 and CRP only among people with lower depressive symptoms (blunting hypothesis). There was no evidence of daily positive events as a buffer against the link between depressive symptoms and inflammation. Thus, these findings support the blunting hypothesis, in which the

protective association between daily positive events and inflammatory markers were blunted under the context of elevated depressive symptoms. Future work should further examine the role of positive experiences in depression and inflammation.

Abstract 1171

IS WELLBEING RELATED TO INFLAMMATION INDEPENDENTLY OF DEPRESSION? LONGITUDINAL ANALYSES OF THE RELATIONSHIP BETWEEN CHANGES IN HEDONIA, EUDEMONIA AND CHANGES IN DIFFERENT INFLAMMATORY MARKERS OVER TIME

Daisy Fancourt, PhD, Department of Behavioural Science and Health, University College London, London, NA, United Kingdom, Andrew Steptoe, DSc, Department of Behavioural Science and Health, University College London, London, United Kingdom

Objectives

There is a large literature linking inflammation with mental ill health, but a much smaller literature focusing on mental wellbeing. Specifically, it remains unclear whether mental wellbeing is longitudinally independently associated with inflammation or only via associated changes in mental ill health.

Methods

This study used data from 8,780 adults aged 50+ in the English Longitudinal Study of Ageing. Hedonic wellbeing (both positive affect and life satisfaction) and eudemonic wellbeing (self-realisation and control-autonomy) were measured at data collection waves 2 (2004/05), 4 (2008/09) and 6 (2012/13), along with measures of C-reactive protein (CRP), fibrinogen and white blood cells (WBC). Fixed effects modelling was performed to identify the longitudinal relationship between wellbeing and inflammation over the three time-points, adjusting for time-varying mental ill health and other identified confounders.

Results

Both aspects of hedonic wellbeing were associated with lower WBC count, independent of mental ill health (positive affect -0.051, 95%CI -0.077 to -0.026; life satisfaction -0.012, 95%CI -0.021 to -0.002). For life satisfaction, this relationship was explained by confounders, whilst for positive affect it persisted (-0.034, 95%CI -0.059 to -0.009). Both aspects of eudemonic wellbeing were associated with lower CRP, fibrinogen and WBC, independent of mental ill health (self-realisation -0.063, 95%CI -0.083 to -0.043; life satisfaction -0.030, 95%CI -0.053 to -0.007). For control-autonomy, this relationship was explained by confounders, whilst for self-realisation it persisted (-0.044, 95%CI -0.064 to -0.024). Results were present in both men and women, although more strongly in men, with no moderation by age or BMI. Sensitivity analyses showed consistency when testing a range of model assumptions.

Conclusions

This study builds on the strong literature showing a relationship between mental ill health and inflammation by showing that there is also an apparently independent relationship between mental wellbeing, in particular eudemonic wellbeing, and inflammation that is unexplained by socio-economic or other time-constant factors and in some instances persists independent of time-varying confounders.

PAPER SESSION:

EARLY LIFE EXPERIENCES AND BIOBEHAVIORAL IMPRINTING

Friday, March 13 from 1:30 to 2:30 pm

Abstract 1545

PROSPECTIVE ASSOCIATIONS BETWEEN LIPID PROFILES AT BIRTH AND MENTAL HEALTH AT SCHOOL ENTRY

Erika Manczak, PhD, Psychology, University of Denver, Denver, CO, Ian Gotlib, PhD, Psychology, Stanford University, Stanford, CA

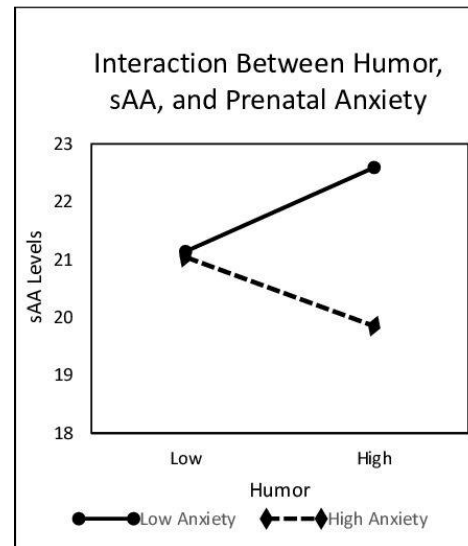
The fetal environment is increasingly implicated in later psychological health, but the role of lipids is unknown. Furthermore, although cross-sectional associations between lipid profiles and mental health have previously been identified, researchers have largely assumed a causal model in which mental health states contribute to lipid levels, such as through alterations in health behaviors. Guided by a psychoneuroimmunological model, the current study sought to test a reverse-directionality pathway by investigating whether lipid profiles in umbilical cord blood forecast patterns of psychological functioning five years later. Specifically, assessments of high-density lipoprotein (HDL), very low-density lipoprotein (VLDL), and triglycerides in umbilical cord blood were assessed in 1,369 children participating in the ethnically diverse Born in Bradford (BiB) birth cohort and then examined in relation to teacher-rated psychosocial competence during children's Reception Year (equivalent to kindergarten in the United States). Results of ordinal logistic regressions indicated that low levels of HDL, high levels of VLDL, and high levels of triglycerides predicted greater likelihood of being rated as less competent in domains of emotion regulation, self-awareness, and interpersonal functioning. Furthermore, these results generalized across ethnic background and child sex and were not accounted for by variables reflecting mothers' psychological or physical health, children's physical health, or children's special education status. Together, this work identifies fetal exposure to anomalous lipid levels as possible contributors to subsequent psychological health and social functioning; results will be discussed within an elaborated psychoneuroimmunological model of mental health risk.

Abstract 1724

THE RELATIONSHIP BETWEEN COPING STYLES AND PRENATAL SALIVARY ALPHA-AMYLASE AMONG LOW-INCOME MOTHERS

Janet Tran, Pre-BA, John Lucero, Pre-BA, Morgan Shakeshaft, BA, Isabel Barros, BS, Karissa G. Miller, PhD, Guido G. Urizar, PhD, Psychology, California State University, Long Beach, Long Beach, CA Salivary alpha-amylase (sAA) is a non-invasive biomarker of stress which reflects activation in the sympathoadrenal medullary system. Previous studies have shown high sAA is associated with psychological distress and anxiety during pregnancy as well as adverse outcomes such as low birth weight and preterm birth; however, little research has explored coping strategies that might influence sAA during pregnancy. The current study examined whether 14 different coping strategies were associated with prenatal sAA during early pregnancy (17 weeks or less) and the 2nd trimester among a group of 100 low-income women derived from a larger stress management study who were either low ($n=53$) or high ($n=47$) on prenatal anxiety (Prenatal Anxiety Scale). Coping strategies were measured using the Brief COPE, and total sAA was assessed using Area Under the Curve analysis of saliva samples collected by participants 7 times/day (four morning samples, 12pm, 4pm and 8pm). Linear regression analyses showed that greater use of active coping ($R^2 = .10$, $B = -1.05$, $SE = .38$, $p = .006$) and planning ($R^2 = .07$, $B = -.72$, $SE = .35$, $p = .044$) were related to lower sAA in early pregnancy, while acceptance was marginally related to lower sAA during the second trimester ($R^2 = .07$, $B = -.95$, $SE = .49$, $p = .056$), and that these relationships did not differ by level of prenatal anxiety (PA). On the other hand, the relationship between the use of humor and sAA during early pregnancy was moderated by prenatal anxiety ($R^2 = .07$, $B = -.14$, $SE = .07$, $p = .045$). Specifically, greater use of humor was associated with lower sAA among women with high prenatal anxiety, but higher sAA among women with low prenatal anxiety (see Figure 1). These results suggest that the use of humor may be an adaptive coping strategy for women with prenatal anxiety, and highlight specific coping strategies (active coping, planning, acceptance) that may be most beneficial for reducing biological indicators of stress among low-income women during pregnancy. Future studies should examine ways to increase the usage of these coping strategies during pregnancy to potentially mitigate the negative effects of sAA on birth outcomes and maternal mental health.

Figure 1. Relationships between salivary alpha amylase and humor in low and high anxiety individuals.



Abstract 1327

HOW EARLY LIFE AND RECENT LIFE STRESS EXPOSURE SHAPES CORTISOL REACTIVITY AND DECISION MAKING IN MIDLIFE-TO-OLDER ADULTHOOD

Sara D. McMullin, M.S., Tony W. Buchanan, PhD, Psychology, Saint Louis University, Saint Louis, MO

Experiencing chronic stress is related to poor mental and physical health outcomes. Different models emphasize the timing of chronic stress as a key factor, some suggesting that early life exposure to chronic stress results in worse outcomes than overall life exposure. The effects of lifetime stress exposure as well as the acute experience of stress may both lead to poor decision making. Greater lifetime stress exposure is paradoxically associated with a blunted physiological response to acute stress. Therefore, research investigating stress and decision making should not only measure responses to acute stress, but also lifetime stress exposure to better understand individual differences in decision making under stress. This study is testing which life stress model best predicts deficits in decision making within a sample of 160 middle-to-older aged adults. Lifetime stress exposure is measured using the Stress and Adversity Inventory which is a comprehensive measure of stress occurring across the lifespan from early childhood stressors to more recent stressful events. Participants are also completing a decision making task before and after an acute stressor (i.e., Trier Social Stress Test), to compare decision making performance with and without acute stress. Salivary cortisol is also assessed to measure acute stress reactivity. We predict that greater early life stress and recent stress will be related to poorer decision making and blunted stress physiology in older adults. The study will be completed by February 2020 with current recruitment at $N = 25$. Overall, results of this study will inform how acute and lifetime stress impacts decision making in older adults, specifically financial decisions like those made in the real-world.

Abstract 1455

INTRANASAL OXYTOCIN ENHANCES STRESS-PROTECTIVE EFFECTS OF SOCIAL SUPPORT IN WOMEN WITH NEGATIVE CHILDHOOD EXPERIENCES DURING A VIRTUAL TRIER SOCIAL STRESS TEST

Madelon Riem, PhD, Laura Kunst, M.Sc., Marrie Bekker, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, NA, Netherlands, Monica Fallon, PhD, Business School, monica.fallon@arizona.edu, Mannheim, NA, Germany, Nina Kupper,

PhD, Medical and Clinical Psychology, Tilburg University, tilburg, NA, Netherlands

Oxytocin is considered a biological mechanism underlying stress-protective effects of positive social interactions. It is assumed to underlie the women-specific tend-and-befriend response to stress, although few studies have tested this assertion with female samples. The aim of the present study was, therefore, to test whether oxytocin enhances stress-protective effects of social support during stress in women, taking into account the moderating role of childhood adversity. The sample consisted of 180 female undergraduate students who had reported on experiences of childhood abuse and how often their mother used love withdrawal as an insensitive disciplinary strategy. Women participated in a virtual version of the Trier Social Stress Test (TSST) and were randomly assigned to receive 24 IU oxytocin or a placebo and to receive support or no support from a female friend (sub-groups N = 45). Results showed that oxytocin reduced heart rate variability during the TSST in participants who received support, possibly indicating that oxytocin increases attention and stimulates a challenge motivational state in the presence of a friend (see Figure 1). In addition, we found that, in the presence of a friend, oxytocin reduced state anxiety levels and cortisol levels after the TSST, but only in women with higher levels of adverse childhood experiences (see Figure 2). Our findings may indicate that oxytocin is a neurobiological means to attain and benefit from social support under stressful circumstances, which may be particularly adaptive for women with a history of adversity. Thus, oxytocin may function as motivator for affiliative disposition during stress exposure in women with a history of childhood adversity.

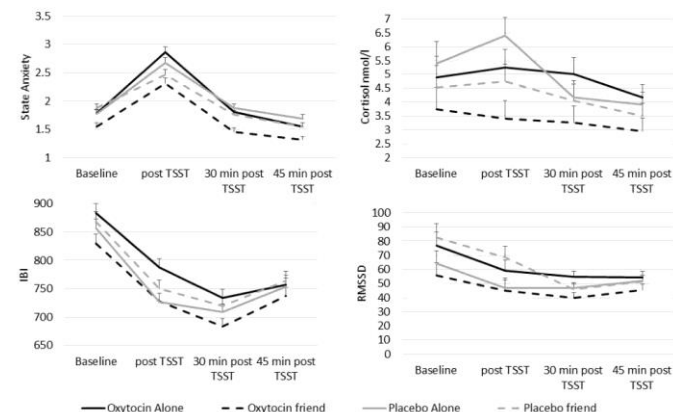


Figure 1. Mean (SE) anxiety and cortisol levels at baseline, immediately after virtual TSST, and 30 minutes, and 45 minutes after speech onset, and RMSSD and IBI at baseline, during the preparation, speech, and math part of the virtual TSST.

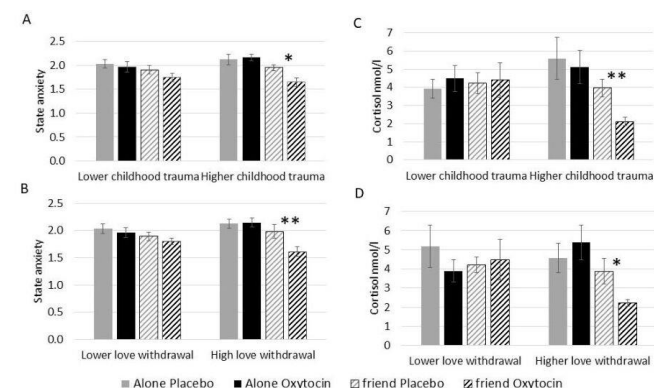


Figure 2. Mean (SE) state anxiety and cortisol levels after virtual TSST for participants in the alone-placebo, alone-oxytocin, friend-placebo, friend-oxytocin condition, stratified for individuals with higher or lower levels of childhood trauma.

PAPER SESSION:

ECONOMICS AND HEALTH

Thursday, March 12 from 11:45 am to 12:45 pm

Abstract 1174

PREVALENCE OF UNMET BASIC NEEDS AND ASSOCIATION WITH DIABETES CONTROL AND CARE UTILIZATION AMONG INSURED PERSONS WITH DIABETES

Stephanie L. Fitzpatrick, PhD, Teresa M. Kimes, MS, Dea Papajorgji-Taylor, MPH, Matthew P. Banegas, PhD, Center for Health Research, Kaiser Permanente, Portland, OR

Unmet basic needs (e.g., food insecurity, inadequate housing, and lack of transportation) are major barriers to diabetes self-management, including healthy eating and medication adherence. The purpose of this study was to identify the prevalence of unmet basic needs among insured persons with diabetes (DM) who receive care at a large, integrated health system and examine the associations of unmet basic needs with DM control, care utilization, and medication adherence.

There were 4,043 adult patients with DM who either had existing social diagnosis codes data in the electronic health record (EHR) or completed the Your Current Life Situation, a 9-item screener for unmet basic needs, during the study period (January 1, 2016 - August 31, 2017). Hemoglobin A1C, care utilization (outpatient, emergency department, hospitalization), and DM oral medication refill data were extracted from the EHR 12 months prior to screening for unmet basic needs. A1C and care utilization data were also extracted from the EHR 6 months post-screening. Poor DM control was defined as A1C $\geq 8\%$. DM-related oral medication non-adherence was defined as having a gap of ≥ 7 days for refills. We compared patients with unmet basic needs to those with no needs on DM control, care utilization, and gaps in medication refills using multivariable regression models.

Of the 4,043 patients with social data, 25% endorsed one or more unmet basic need (21% with financial hardships, 8.3% with concerns about their living situation, and 6.8% with food insecurity). Adjusting for demographics, Charlson, and number of years with diabetes, the presence of unmet basic needs was associated with an increased likelihood of having an A1C $\geq 8\%$ (OR = 1.8, 95%CI 1.47,2.13), more outpatient visits (Incidence Rate Ratio [IRR] = 1.3, 95%CI 1.2,1.4), more ED visits (IRR = 2.3, 95%CI 2.0,2.6), more hospitalizations (IRR = 1.8, 95%CI 1.5,2.2), and more gaps in oral DM medication refills (IRR = 1.2, 95%CI 1.1,1.3) 12 months prior to screening. There were similar findings at 6 months post-screening for DM control and care utilization.

Findings indicate that unmet basic needs are highly prevalent even among an insured patient population. Future studies to determine strategies for universal screening and implementation of this information in treatment planning are warranted.

Abstract 1653

FINANCIAL STRAIN MODERATES THE RELATIONSHIP BETWEEN EMA-ASSESSED POSITIVE AND NEGATIVE EMOTIONS AND IL-6 IN HEALTHY MIDLIFE WOMEN

Megan M. Fritz, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Pauline Maki, PhD, Psychiatry, Psychology, and Obstetrics & Gynecology, University of Illinois at Chicago, Chicago, IL, Rebecca C. Thurston, PhD, Psychiatry, Epidemiology, and Psychology, University of Pittsburgh, Pittsburgh, PA

Background: Trait positive and negative affect are associated with circulating levels of inflammatory markers. However, this work has primarily used retrospective emotion reports, and less is known about associations between inflammation and emotions assessed via ecological momentary assessment (EMA). Additionally, indices of low socioeconomic status such as financial strain have been linked with inflammation. Yet, little is known about whether financial strain may moderate associations between emotions and inflammation. The current investigation sought to test the relationship between EMA-assessed emotions, financial strain, and inflammation.

Method: A sample of 163 midlife women completed 3 consecutive days of EMA assessments, during which they were prompted 5 times/day to report current positive and negative emotions (i.e., energetic, involved, calm, happy, lonely, stressed, sad, angry). They also completed questionnaires including financial strain, and underwent fasting phlebotomy for indices of inflammation (i.e., IL-6, CRP, and IL-10). Associations between individual emotions (averaged across the 3-day EMA period), as well as positive and negative emotion composites, and inflammation were tested in linear regression models adjusted for age, race/ethnicity, and body mass index. Interactions with financial strain were tested. Results: Financial strain significantly moderated the relationship of individual emotions, and positive and negative emotion composites, to IL-6, (composite interaction p 's $< .01$, see Figures 1-2), but not CRP or IL-10 (p 's $> .05$). In the context of financial strain, feeling energetic, calm, and happy was associated with lower levels of IL-6, (interaction p 's $< .05$). Financial strain also interacted with feeling angry, stressed, lonely, and sad to predict higher levels of IL-6 (interaction p 's $< .05$). These associations persisted with additional adjustment for education, depression, and antidepressant or immune medications.

Conclusion: Financial strain significantly moderated the relationship between daily emotions and IL-6. For financially strained women, EMA reports of negative emotions were associated with higher IL-6, and EMA reports of positive emotions were associated with lower IL-6. Financial strain may be an important consideration in the link between emotions and inflammation among midlife women. Supported by RF1AG053504.

Figure 1.

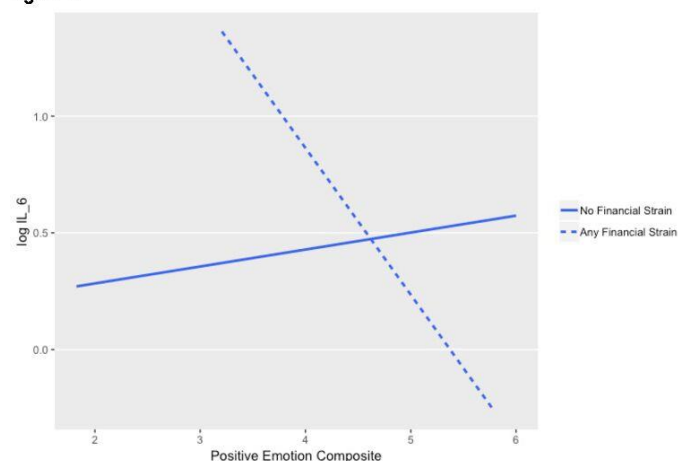
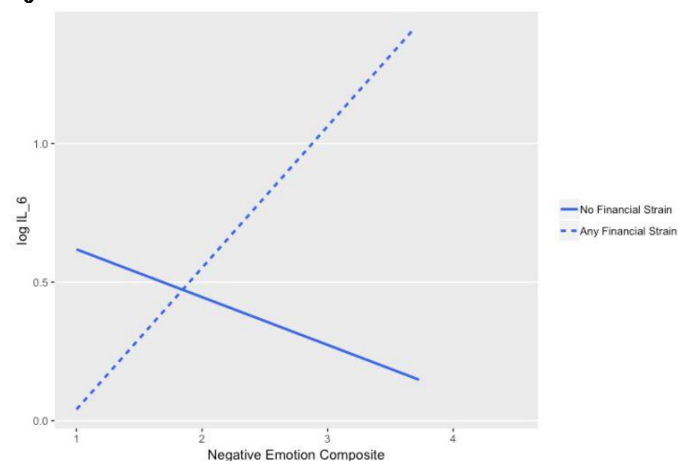


Figure 2.



Abstract 1624

HOW COST EFFECTIVE ARE THERAPIST DELIVERED AND WEB-DELIVERED VERSIONS OF COGNITIVE BEHAVIOURAL THERAPY WHEN COMPARED TO TREATMENT-AS-USUAL FOR IRRITABLE BOWEL SYNDROME?

Rona Moss-Morris, PhD, Psychology, King's College London, London, United Kingdom, Paul McCrone, PhD, Education, Health and Human Sciences, University of Greenwich, London, United Kingdom, Hazel Everitt, PhD, Primary Care, University of Southampton, Southampton, United Kingdom, Trudie Chalder, PhD, Psychological Medicine, Sabine Landau, PhD, Biostatistics & Health Informatics, King's College London, London, United Kingdom

Background: Irritable bowel syndrome (IBS) affects between 12-20% of the population. Many patients continue to suffer distressing and often disabling symptoms despite first line medical treatments. The ACTIB randomised controlled trial (RCT) showed that both telephone therapist delivered CBT (TCBT) and web-based CBT with guided support (WCBT) were significantly more effective than treatment as usual (TAU) at reducing IBS symptom severity and impact at 12 months in adults with refractory IBS. Both CBT groups also showed significant reductions in anxiety and depression when compared to TAU. The aim of this nested study was to assess the cost-effectiveness of TCBT and WCBT compared to treatment as usual TAU for refractory irritable bowel syndrome (IBS).

Design 558 patients were recruited in the ACTIB RCT from 74 general practices and 3 gastroenterology centres. Patients were randomised into three arms, TCBT + TAU; WCBT+TAU and TAU alone. Interventions costs were calculated for 12 months post randomisation. Costs included the CBT intervention, other service use (e.g. GP visits, secondary care, social care) and lost employment. Quality-adjusted life years (QALYs), generated with the EQ-5D-5L, were combined with the costs to determine cost-effectiveness of TCBT and WCBT compared to TAU.

Results TCBT cost £956 more than TAU (bootstrapped 95% CI, £601 to £1435) and generated 0.0429 more QALYs. WCBT cost £224 more than TAU (bootstrapped 95% CI, -£11 to £448) and produced 0.029 more QALYs. Compared to TAU, TCBT had an incremental cost per QALY of £22,284 and WCBT £7724. After multiple imputation these ratios increased to £27,436 and £17,388 respectively. Including lost employment and care from family/friends, TCBT had costs that were on average £866 lower than TAU (bootstrapped 95% CI, -£1133 to £2957), and WCBT had costs that were £1028 lower than TAU (bootstrapped 95% CI, -£448 to £2580).

Conclusion TCBT and WCBT resulted in more QALYs but increased healthcare cost than TAU. If societal costs are included, then TCBT and WCBT show economic savings. Complete case analysis suggests both therapies are cost-effective from a healthcare perspective. Imputation for missing data reduces cost-effectiveness. WCBT appears to be the most cost effective option for delivering CBT and is a highly scalable intervention as it requires minimal therapist contact.

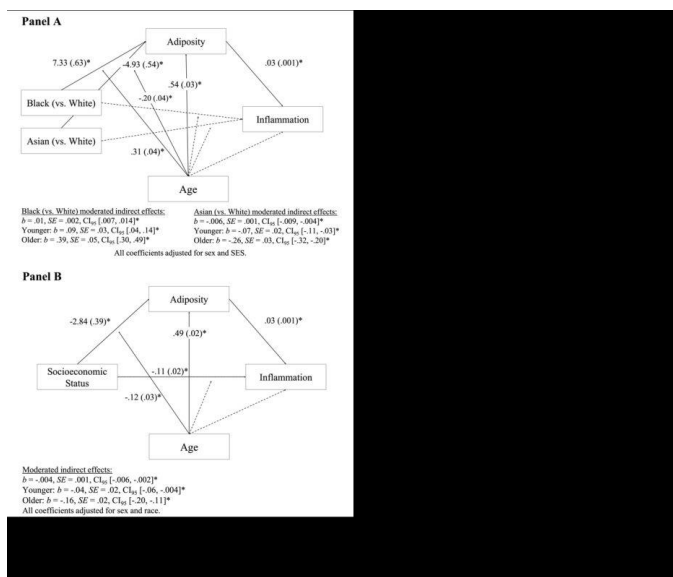
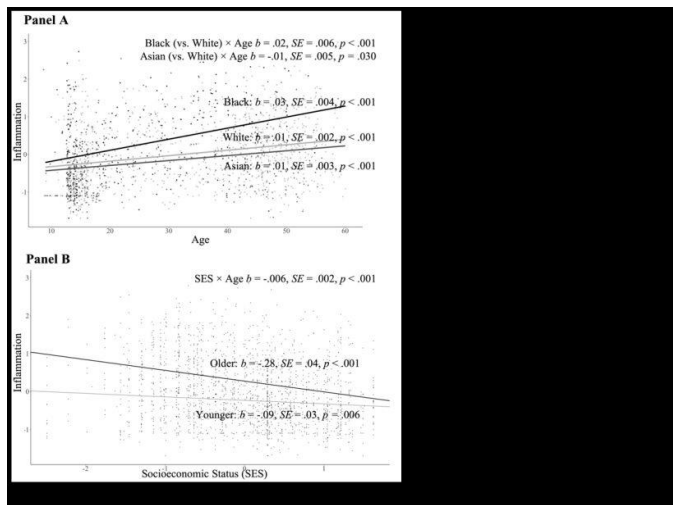
Abstract 1241

RACE, SOCIOECONOMIC STATUS, AND INFLAMMATION ACROSS THE LIFESPAN: A MEGA-ANALYSIS

Phoebe H. Lam, MS, Psychology, Northwestern University, Evanston, IL, Jessica J. Chiang, PhD, Psychology, Georgetown University, Washington, DC, Edith Chen, PhD, Gregory E. Miller, PhD, Psychology, Institute of Policy Research, Northwestern University, Evanston, IL

A plethora of health conditions, including cardiovascular diseases, respiratory diseases, and cancer, are patterned by race and socioeconomic status (SES), and low-grade chronic inflammation is proposed as a key underlying mechanism. Importantly, theories for how race and SES foster a state of chronic inflammation emphasize a lifecourse approach: stress associated with racial and SES minority status drive alterations in biological, psychosocial, and behavioral processes that modulate inflammatory activities, and notably, these

alterations unfold, accumulate, and solidify over time. As such, racial and SES disparities in inflammation should strengthen across the lifespan as these putative pathways become established. Testing this hypothesis is challenging as single samples rarely include multiple racial and SES groups that each spans a wide age range, resulting in underpowered cell sizes that preclude proper testing of race and SES by age effects. To overcome these challenges, we conducted a mega-analysis by integrating data from eight studies, producing a sample of over 1700 individuals aged 11 to 60 years. Using these data, we examined whether race (White, Black, and Asian) and SES (income, savings, education) associations to inflammation (CRP and IL-6) varied by age and whether adiposity (waist circumference) operated as an explanatory factor. Compared to Whites, Blacks exhibited higher ($\beta = .18, p < .001$), whereas Asians exhibited lower ($\beta = -.16, p < .001$), levels of inflammation, and these racial differences were explained by higher and lower adiposity, respectively (indirect effect for Black: $b = .19, SE = .03, p < .001$; Asian: $b = -.13, SE = .02, p < .001$). Similarly, lower SES was associated with greater inflammation ($\beta = -.19, p < .001$) via elevated adiposity (indirect effect $b = -.09, SE = .01, p < .001$). Importantly, these associations varied across the lifespan. Racial and SES differences in inflammation strengthened as age increased (interaction $\beta s > .08$, depicted in Figure 1) and so did the adiposity pathways linking race and SES to inflammation (moderated indirect effects $ps < .001$, depicted in Figure 2). Collectively, these findings suggest that racial and SES differences in inflammation, and their pathways via adiposity, strengthen across the lifespan, highlighting the importance of considering the developmental context when examining health disparities.



PAPER SESSION:

EFFECTS OF PERCEIVED DISCRIMINATION ON HEALTH PATHWAYS AMONG UNDERREPRESENTED POPULATIONS

Saturday, March 14 from 3:15 to 4:30 pm

Abstract 1255

HEALTH BEHAVIORS AND PERCEIVED DISCRIMINATION AMONG LATINXS

Carlos E. Rosas, M.A., Catherine Pichardo, M.A., Psychology, Lisa Sánchez-Johnsen, Ph.D., Psychiatry, Surgery, & Psychology, University of Illinois at Chicago, Chicago, IL

Introduction. Perceived discrimination has a detrimental effect on the health of Latinxs (Lee & Ahn, 2012). However, the mechanisms that underlie this relationship remain understudied. Theoretical models and emerging research suggest that health behaviors serve as coping responses to discrimination (Corral & Landrine, 2012). To date, no study has reviewed the literature on the association between perceived discrimination and health behaviors among Latinxs. Thus, the aim of this presentation is to synthesize the research and conduct a systematic review of the literature on perceived discrimination and alcohol use, marijuana use, smoking, sleep quality, and physical activity. The secondary aim is to provide specific recommendations for future research in these areas. **Methods.** A comprehensive review of published articles in PsycINFO, PubMed, Sociological Abstracts, and Ethnic NewsWatch was conducted. These search engines were selected because of their focus on social science and health. **Results.** A total of 33 peer-reviewed articles were obtained. Findings suggest that perceived discrimination is related to increased alcohol use (e.g., Acosta et al., 2015), marijuana use (e.g., Basáñez et al., 2013), smoking (e.g., Lorenzo-Blanco et al., 2011), and poor sleep (e.g., Zeiders et al., 2017). No studies on physical activity were found. Alcohol use ($n = 8$; 24.2%) was the most common health behavior examined, followed by smoking ($n = 6$; 18.2%). Only two (6.1%) studies examined sleep. All studies used self-report tools to assess health behaviors. Most studies ($n = 20$; 60.6%) were longitudinal. **Discussion.** Critical issues regarding methodology include the use of scales not previously validated and inconsistent assessment in terms of the timeframe and type of discrimination and health behaviors across studies. Important gaps found in previous reviews persist, including the lack of research on Latinx groups others than Mexicans and in new immigrant settlements. Future research should examine the mechanisms through which perceived discrimination influences health behaviors and the factors that may buffer against the dire effects of discrimination. The use of objective measures is recommended for future studies. In addition, research that examines the role of perceived discrimination on other health behaviors, such as physical activity and eating behaviors, is needed.

Abstract 1381

DAILY DIARY ASSESSMENTS OF PERCEIVED DISCRIMINATION AND SELF-REPORTED SLEEP IN A COMMUNITY SAMPLE OF BLACK AND WHITE ADULTS

Kimberly G. Lockwood, PhD, Center for Health and Community, University of California, San Francisco, San Francisco, CA, Peter J. Gianaros, PhD, Psychology, Karen A. Matthews, PhD, Psychiatry, Anna L. Marsland, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Perceived discrimination is associated with poorer physical and mental health. Sleep may be one mechanism that contributes to this relationship, as poor sleep is related to both discrimination and adverse health outcomes. Prior studies linking discrimination with sleep have assessed discrimination using single-occasion global or retrospective reports of perceived discrimination. It is unknown if more ecologically valid measures of discrimination (e.g., daily diaries) are also associated with sleep. As such, this study tested whether daily diary reports of perceived discrimination were related to self-reported sleep at baseline

and during the daily diary period. Participants were 123 healthy White and Black adults recruited from the Pittsburgh community (25-52 years, 65% female, 52% Black). At baseline, participants completed the Pittsburgh Sleep Quality Index (PSQI) and covariate measures. Participants then completed brief daily surveys for 14 days, including a modified version of the Everyday Discrimination Scale and self-reported sleep quality, duration, and disturbances. Individual difference variables were created for the diary variables by averaging across diaries. Due to skew, participants were split into 3 discrimination groups: none, low, and high. ANCOVAs controlling for age, sex, and BMI showed that PSQI total score and disturbance subscale differed by discrimination group ($F=8.05$, $\eta_p^2=.12$, $p=.001$; $F=6.33$, $\eta_p^2=.10$, $p=.002$). Diary sleep quality and disturbances also differed by discrimination group ($F=9.54$, $\eta_p^2=.14$, $p<.001$; $F=4.77$, $\eta_p^2=.08$, $p=.010$). Effects were driven primarily by worse sleep quality and more disturbances among the high discrimination group compared with no discrimination. Effects were attenuated with negative affect in the model. The PSQI duration subscale and diary sleep duration did not differ significantly by discrimination group. Race did not moderate the effects. These results provide initial evidence that daily experiences of discrimination are associated with self-reported sleep quality and disturbances. Our analyses also suggest that negative affect may play a role in the relationship between daily discrimination and poor sleep. Taken together, these results align with prior studies on discrimination and sleep, and add to our knowledge by showing that daily experiences of unfair treatment may also contribute to poor sleep.

Abstract 1707

EXAMINING DISCRIMINATION, CRP LEVELS, AND ASSOCIATED CVD RISK AMONG YOUNG GAY AND BISEXUAL MEN

Laura Scrimbolo, BS, Epidemiology, Nicholas Mirin, BA, Erica Wood, MPH, Social and Behavioral Sciences, Esther Fleharty, BS, Epidemiology, New York University, New York, NY, Minerva Francis, MA, Health Behavior, Columbia University, New York, NY, Raven Barrett, ., Public Health, Stephanie H. Cook, DrPh, Depts. of Social and Behavioral Sciences and Biostatistics, New York University, New York, NY

Background: Cardiovascular disease (CVD) is one of the leading causes of mortality within the United States. Evidence also suggests that sexual minorities have a greater risk for morbidity and mortality than heterosexuals due to the disproportionate burden of stress, stigma, and discrimination affecting that population. Everyday experiences of discrimination can take a physical toll on the health of an individual, elevating inflammatory biomarkers such as C-reactive protein (CRP). High CRP levels are indicative of a sustained inflammatory response, which over time leads to plaque build-up and cellular wall damage in the arteries.

Methods: Participants were recruited from the P18 cohort of the Center for Health, Identity, Behavior, and Prevention Studies Center (N = 60). This cohort consists of young gay and bisexual men (YGBM). The validated Everyday Discrimination Scale – Expanded (EDS) was used to evaluate frequency of everyday discrimination. Higher scores indicated greater exposure to discriminatory events. Mean age was 26.58 (SD = 0.87) and the majority of the sample was non-white (75.86%). Blood draws followed the questionnaire to assess high-sensitivity C-reactive (hsCRP) protein concentrations. Collected values were categorized into levels of clinical CVD risk: low (< 1.00 mg/L), average (1.00 - 3.00 mg/L), and high (> 3.00 mg/L).

Results: Multinomial regression models were conducted to evaluate the association between everyday discrimination and CRP. The relative risk (RR) of being in the high-risk CRP group (> 3.00 mg/L) was greater for YGBM who experienced more everyday discrimination compared to YGBM in the low risk CRP group (< 1.00 mg/L; RR = 2.13, $p = 0.047$).

Conclusions: Study findings suggest that those that experience more everyday discrimination have higher CRP values compared to those

with fewer experiences. Findings underscore the need to further investigate the association between everyday discrimination and markers of inflammation among sexual minority youth.

Abstract 1211

RACE, THREAT BIAS, AND HEART RATE VARIABILITY IN HIGH TRAIT ANXIOUS INDIVIDUALS

Raimy T. Jamal, High school diploma, Sirena A. St.Ours, high school diploma, Karissa G. Miller, PhD, psychology, california state university, long beach, long beach, CA

Individuals with anxiety tend to show attentional biases favoring threat related information as well as lower cardiac vagal tone [(often indexed via high frequency heart rate variability (HF-HRV)]. Threat biases have been linked to lower HF-HRV among non-anxious individuals, though associations among individuals with anxiety are less clear, and few have examined race differences in the relationships among threat processing and HF-HRV. The current study aimed to examine associations of race and threat bias with HF-HRV among a group of 71 high trait anxious individuals ($M_{age}=22.18$, $SD=7.31$, 57.7% female) taken from a larger threat bias modification study conducted at the University of Pittsburgh. We hypothesized that individuals with more threat bias would have the lowest HF-HRV, and that this association would be strongest among nonwhite individuals who may be more likely to experience threats in their environment. Participants scored in the upper tertile of trait anxiety ($M_{STAI}=45.69$, $SD=7.05$), and because of the low number of nonwhite individuals, we dichotomized race as “white” (65%) and “nonwhite” (35%). Threat bias scores were calculated via response times from a computerized attention bias measure (ARDPEI), which assesses extent of vigilance toward, and difficulties disengaging from threat (both of which were dichotomized into high vs. low bias). Respiration-adjusted HF-HRV was derived from a 5 minute ECG taken at rest. Separate 2x2 ANOVAs were conducted to examine whether race and each threat bias measure influenced HF-HRV, as well as whether relationships of threat bias and HF-HRV differed by race. Results indicated that mean HF-HRV did not differ by race or disengagement. However, individuals with more vigilance to threat had higher HF-HRV ($M=6.44$, $SD=1.30$) relative to those with lower vigilance [$(M=6.02$, $SD=1.19)$, $F(1,67)=4.39$, $p=.04$], and a marginally significant interaction suggested that greater vigilance was related to higher HF-HRV, but only among nonwhite individuals $F(1,67)=3.87$, $p=.05$. These results indicate that relationships among threat bias and HF-HRV may differ by race, and that among nonwhite individuals, vigilance toward threat is related to higher HF-HRV. Because higher HF-HRV is considered adaptive, future studies should examine whether greater vigilance to threat may be beneficial among individuals who have been exposed to threat.

Abstract 1540

RACIAL AND ETHNIC DISPARITIES IN CORTISOL REACTIVITY AND THE MODERATING ROLE OF DISCRIMINATION

Kimberly A. Dienes, PhD, Division Psychology and Mental Health, University of Manchester, Manchester, United Kingdom, Justin Garber, PsyD, Psychology, Private Practice, Waldwick, NJ

Objectives: Research has shown the existence of racial and ethnic health disparities. Understanding possible biological mechanisms (e.g. cortisol secretion) is essential for reducing these disparities. Experiences of discrimination may be acute stressors that influence cortisol secretion over time. Discrimination may moderate the relationship between race and altered biological stress processes such that blunted cortisol occurs only for racial and ethnic minorities who experience discrimination. We compared cortisol reactivity across an acute social stress task among racial and ethnic minorities and examined the moderating role of discrimination.

Design: Experimental study with race/ethnicity (Black/White/Hispanic), discrimination (lifetime and recent), and their

interaction predicting cortisol reactivity (Area Under the Curve ground and increase (AUCg, AUCi)) across the Trier Social Stress Test (TSST). An ANOVA with a Tukey post hoc test and regression analyses were conducted.

Method: Participants were 48 students (age 18-58, 62.5% female, 37.5% Non-Hispanic White, 14.6% Hispanic, and 41.7% Black) at a Midwestern university in the USA. Salivary cortisol samples were taken at baseline, post task, 10, 25, and 40 min.

Results: There was a statistically significant difference among racial groups at 10 and 40 min post task, and for AUCg. Black participants had significantly less cortisol secretion across the TSST than Hispanic participants, and the difference between Black and White participants approached significance. Black participants reported significantly more discrimination than White participants. Recent discrimination significantly moderated the relationship between race and cortisol secretion. Discrimination led to a blunted pattern of cortisol secretion for White and Hispanic, but not for Black participants.

Conclusions: Black participants had blunted cortisol reactivity across an acute social stress task compared to White and Hispanic participants. Blunted cortisol reactivity has been associated with chronic stress and fatigue in past research. Contrary to prediction, Black participants had less variability in cortisol reactivity following recent discrimination than the other racial groups. Lack of variability in cortisol reactivity may be a biological marker of risk for negative health outcomes based on recent research.

PAPER SESSION:
GENETIC SUSCEPTIBILITY, DEPRESSIVE SYMPTOMS, AND PHYSIOLOGICAL PATHWAYS
Friday, March 13 from 1:30 to 2:30 pm

Abstract 1265
GENETIC SUSCEPTIBILITY, INFLAMMATION AND SPECIFIC TYPES OF DEPRESSIVE SYMPTOMS: EVIDENCE FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING
Philipp Frank, MSc, Olesya Ajnakina, PhD, Andrew Steptoe, DSc, DPhil, Dorina Cadar, PhD, Behavioural Science and Health, University College London, London, NA, United Kingdom

Background: Genetic susceptibility to depression has been established using polygenic scores (PGS), but the underlying mechanisms and the potential differential effects on specific types of depressive symptoms remain unexplored. Emerging evidence supports a link between systemic low-grade inflammation and depressive symptoms. However, previous studies have not yet examined whether the relationship between PGS and symptom-specific dimensions of depression is mediated through systemic low-grade inflammation.

Aim: To examine whether C-reactive protein (CRP) mediates the association between PGS for depressive symptoms and subsequent somatic versus cognitive-affective depressive symptoms.

Method: The sample consisted of 3,510 men and women (aged 50+) recruited from the English Longitudinal Study of Ageing (ELSA). PGS were derived using the results of a recent genome-wide association study. High sensitivity CRP was measured at wave 6 (2012/13) and depressive symptoms at wave 8 (2016/17), using the 8-item version of the Centre for Epidemiological Studies Depression Scale (CES-D). CES-D items were divided into cognitive-affective and somatic symptoms. Baseline covariates (wave 2, 2004/05) included age, sex and 10 principal components to account for potential ancestry differences in population structures. Longitudinal structural equation modelling was performed to investigate the mediating role of CRP in the relationship between PGS and cognitive-affective versus somatic symptoms.

Results: The longitudinal measurement model fitted the data well (RMSA = 0.018, CFI = 0.972). Participants with higher PGS were significantly more likely to report cognitive-affective ($\beta = 0.092$, 95% CI: 0.048; 0.135) and somatic ($\beta = 0.081$, 95% CI: 0.039; 0.123) symptoms at follow-up. CRP mediated the relationship between PGS

and somatic symptoms ($\beta = 0.006$, 95% CI, 0.002, 0.011), explaining a total of 7.41% of this association. In contrast, CRP did not mediate the association between PGS and cognitive-affective symptoms ($\beta = 0.002$, 95% CI, -0.001, 0.004).

Conclusion: Systemic low-grade inflammation may represent one plausible biological pathway linking genetic liability for depressive symptomatology to the development of somatic symptoms of depression, but not cognitive-affective symptoms.

Table 1: Mediation of the association between polygenic scores for depressive symptomatology and specific types of depressive symptoms through C-reactive protein

Independent variable	Mediator	Outcome	Total indirect effect	Total effect	Total direct effect	Total effect mediated
			Standardised Coefficient (Bc CI)	Standardised Coefficient (Bc CI)	Standardised Coefficient (Bc CI)	%
PGS	C-reactive protein	Cognitive-affective factor	0.002 (-0.001, 0.004)	0.092 (0.048, 0.135)	0.090 (0.047, 0.133)	-
PGS	C-reactive protein	Somatic factor	0.006 (0.002, 0.011)	0.081 (0.039, 0.123)	0.075 (0.033, 0.117)	7.41%

Data source: ELSA, waves 2-8; Bc CI: bias adjusted confidence interval. Estimator: WLSMV. Model adjusted for age, sex and 10 principal components to account for ancestry differences

Abstract 1339
GENE SIGNATURES RELATED TO INSULIN SIGNALING AND TYROSINE METABOLISM DEFINE A SUB-TYPE OF DEPRESSION WITH ANHEDONIA AND HIGH CRP

Mandakh Bekhbat, PhD, David R. Goldsmith, MD, Department of Psychiatry and Behavioral Sciences, Michael T. Treadway, MD, Department of Psychology, Bobbi J. Woolwine, MSW, Ebrahim Haroon, MD, Andrew H. Miller, MD, Jennifer C. Felger, PhD, Department of Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA

Background: Inflammation and altered glucose metabolism are two pathways implicated in the pathophysiology of major depressive disorder (MDD). We have shown that high inflammation as measured by C-reactive protein (CRP) in MDD patients is associated with symptoms of anhedonia, a core feature of MDD, along with altered dopaminergic corticostriatal circuitry. Inflammation is associated with cellular re-programming of glucose and lipid metabolism; thus, we assessed immunometabolic changes associated with inflammation and anhedonia in MDD patients. **Methods:** Microarray data from whole blood of unmedicated patients with MDD (n=62) were examined. To assess whether inflammation modified the relationship between anhedonia and metabolic pathways, patients were classified into low (n=32) and high (n=30) anhedonia phenotypes based on an anhedonia subscale of the Inventory of Depressive Symptomatology, then further classified by inflammation based on high-CRP (plasma CRP >3 mg/L) versus low-CRP (≤ 3 mg/L). Functional enrichment of metabolic pathways was assessed in Gene Set Enrichment Analysis using the KEGG pathway database. **Results:** Pathways related to glucose metabolism (insulin signaling, insulin resistance, HIF-1, AMPK, PI3K/AKT signaling) and cancer-related pathways (e.g. genes related to insulin and PI3K/AKT signaling) were significantly enriched in the subset of patients with both high CRP and high anhedonia (all FDR $q < 0.25$). Genes driving enrichment of the insulin signaling pathway (top result in patients with high-CRP and high anhedonia) were predominantly expressed by monocytes ($z = 2.95$, $p < 0.01$). Moreover, in MDD patients with high anhedonia, the tyrosine metabolism pathway was significantly enriched in patients with low versus high CRP (FDR $q < 0.25$). **Conclusions:** Results suggest that gene expression signatures related to glucose metabolism and low tyrosine metabolism define a subset of depressed patients with high inflammation and anhedonia. Enrichment of cancer-related pathways driven by metabolic genes may reflect a shift in immune cell metabolism from oxidative phosphorylation to glycolysis. Together these data suggest that motivational deficits in MDD patients with increased inflammation may be linked to shift in immunometabolism and dopamine availability.

Abstract 1524

ADVERSE CHILDHOOD EXPERIENCES AND POLYGENIC RISK: GENE-ENVIRONMENT INTERPLAY IN LONGITUDINAL TRAJECTORIES OF DEPRESSIVE SYMPTOMS

Eleonora Iob, MSc, Olesya Ajnakina, PhD, Andrew Steptoe, DSc, Behavioural Science and Health, University College London, London, United Kingdom

Background: Adverse childhood experiences (ACE) are linked to greater risk of developing depression. The diathesis-stress model suggests that certain individuals might be more vulnerable to ACE owing to their genetic makeup. Genome-wide association studies indicate that depression is associated with several genetic variants of small effect. However, most research has examined the potential interplay of ACE with specific candidate genes yielding inconsistent results. This study investigated the associations of ACE, polygenic scores (PGS) of major depressive disorder (MDD), and their interactions with trajectories of depressive symptoms.

Methods: We used data from the English Longitudinal Study of Ageing (N=3428; mean age=71 years). Depressive symptoms were ascertained on eight occasions from 2002/03 to 2016/17 using the 8-item Center for Epidemiological Studies Depression scale. ACE (i.e. abuse, dysfunctional household, parent-child bonding, and loss experiences) were assessed retrospectively. Group-based trajectories of depressive symptoms were estimated using Latent Class Growth Analysis. All models were adjusted for sex, age, and five principal components.

Results: We identified three distinct trajectories of depressive symptoms: stable-low (46%), stable-moderate (46%), and stable-high (8%). Each type of ACE ($OR_{Threat}=2.45$ $p<.001$; $OR_{DysHousehold}=2.26$ $p<.001$; $OR_{Bonding}=1.27$ $p<.001$; $OR_{Loss}=1.82$ $p<.001$), the total ACE score ($OR=1.68$ $p<.001$), and the MDD PGS ($OR=1.70$ $p<.001$) were associated with a greater probability of belonging to the high-symptom class compared with the low-symptom class. We found significant interaction effects of the MDD PGS with each type of ACE ($OR_{Threat \times PGS}=1.95$ $p=.015$; $OR_{DysHousehold \times PGS}=1.51$ $p=.001$; $OR_{Bonding \times PGS}=1.10$ $p<.001$; $OR_{Loss \times PGS}=1.73$ $p=.001$) and the total ACE score ($OR=1.29$ $p<.001$). This suggests that the unfavourable effect of ACE on the risk of high- versus low-symptom trajectories was greater amongst those participants at higher polygenic risk. Similar associations were observed when comparing the moderate-symptom class with the low-symptom class, although the effect sizes were weaker than those of the high-symptom trajectory.

Conclusion: Our findings corroborate the evidence for the diathesis-stress model of depression and have relevant implications for interventions to reduce ACE and prevent depression.

Abstract 1250

CHRONIC LIFE STRESS PREDICTS DEPRESSIVE OUTCOMES IN THE FIRST YEAR OF INVASIVE BREAST CANCER: MODERATION BY THE SEROTONIN-TRANSPORTER POLYMORPHISM

Jacqueline H. Kim, Ph.D., Psychology, Steve W. Cole, Ph.D., Medicine and Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA, Karen L. Weihs, M.D., Psychiatry, University of Arizona, Tucson, AZ, Annette L. Stanton, Ph.D., Psychology and Psychiatry/Biobehavioral Sciences, UCLA, Los Angeles, CA

Background: Depression in cancer patients predicts decreased survival, as well as adverse functional and quality of life outcomes, and early identification of risk for depression is needed. Depression is higher in the contexts of both childhood adversity and chronic life stress but their collective influence on depressive outcomes in the first year after breast cancer diagnosis is unknown. Genetic polymorphisms related to socioemotional functioning may moderate the associations among childhood adversity, chronic life stress, and depressive outcomes, specifying which women are most at risk.

Methods: 460 women diagnosed with invasive breast cancer completed 7 assessments of depressive symptoms and CIDI-

determined major depressive episodes across 1 year. Interactions among childhood adversity, chronic life stress, and the serotonin-transporter (HTTLPR) polymorphism were examined with depressive outcomes using multilevel modeling, multinomial logistic regression, and logistic regression.

Results: Higher chronic life stress predicted greater depressive symptoms at study entry, greater relative risk for belonging to a High/Recovery vs. Low depressive symptoms trajectory class, and greater odds of having a major depressive episode during the year. The influence of chronic life stress on depressive symptoms over time was moderated by HTTLPR genotypes, with no decline in symptoms for women with high chronic stress and the ss genotype vs. significant improvement in depressive symptoms in the face of chronic life stress for women with the ll/lS genotype. Childhood adversity did not predict any depressive outcomes, and there was no significant interaction of childhood adversity with chronic life stress or with HTTLPR genotypes.

Conclusion: During the initial period following cancer diagnosis, chronic life stress predicts heightened depressive symptoms. Women with greater chronic life stress are also at risk for high unremitting depressive symptom trajectories and major depressive episodes during the first year after diagnosis. Variation in HTTLPR polymorphisms was relevant for identifying the degree of change in women's depressive symptoms longitudinally. These findings suggest that women with high chronic life stress and the HTTLPR ss genotype may benefit from early intervention to prevent and treat depression after breast cancer diagnosis.

PAPER SESSION:

IMPACT OF INTERPERSONAL CHALLENGES ON PHYSIOLOGY AND HEALTH

Thursday, March 12 from 11:45 am to 12:45 pm

Abstract 1614

THE ROLE OF CHILDHOOD MALTREATMENT AND REGULATORY PROCESSES ON INFLAMMATION DURING SPOUSAL BEREAVEMENT

Michelle A. Chen, BA, Christopher Fagundes, PhD, Psychological Sciences, Rice University, Houston, TX

Early life adversity, such as childhood maltreatment, promotes inflammation throughout the lifespan, increasing vulnerability to cardiovascular disease and other health problems. Childhood maltreatment is characterized by an exaggerated stress-response, which in turn, leads to elevated inflammation, a key mechanism underlying cardiovascular (CVD). Data suggests that spousal bereavement is the most stressful life event one will likely experience in their lives; those who experienced child maltreatment may be at particular risk for the negative physical health consequences related to this stressor. People's capacity for self-regulation, as indexed by heart rate variability (HRV) and self-report, also impacts how people respond to stressful life events. In 160 widow(er)s, followed over the first year of bereavement, we will identify how individual differences in self-regulatory ability affects the relationship between childhood maltreatment, inflammation, and well-being. By understanding how individual differences in a widow(er)'s capacity to cope with stressful life events impact health outcomes, we will be better able to develop targeted interventions for this vulnerable population.

Abstract 1398

INTIMATE PARTNER VIOLENCE AND LOWER RELATIONSHIP QUALITY PREDICT FASTER BIOLOGICAL AGING

Kyle J. Bourassa, PhD, Center for the Study of Aging and Human Development, Duke University Medical Center, Durham, NC, Avshalom Caspi, Ph.D., Terrie E. Moffitt, Ph.D., Psychology & Neuroscience, Duke University, Durham, NC

Being involved in romantic relationships is associated with improved health, and the characteristics of ongoing relationships also have health relevance. For example, better romantic relationship quality and more intimate partner violence (IPV) have been independently linked to poorer health. However, few studies have examined these associations longitudinally during young adulthood and midlife, a developmental window when many romantic relationships are formed and prevention could improve later-life health. The current study examined relationship characteristics and biological aging across 20 years of midlife using participants from the Dunedin Study who reported on their relationship status, relationship quality, and IPV at ages 26, 32, 38, and 45. Biological aging was measured using the pace of aging, a validated measure of 18 biomarkers repeated across the 4 assessments that represented the coordinated decline of organ systems across the body. We first tested the association of relationship history (partnered at 0-4 study waves) and pace of aging among study participants ($n = 974$). We then examined the association of relationship quality and IPV with the pace of aging among partnered participants who reported on these characteristics during at least 50% of the 4 study phases ($n = 912$). As predicted, study members who were more often in a romantic relationship had a slower pace of aging, $\beta = -0.17$, $p < .001$. People with better relationship quality also had a slower pace of aging, $\beta = -0.19$, $p < .001$, whereas those with higher levels of IPV had a faster pace of aging, $\beta = 0.26$, $p < .001$. Relationship quality and IPV were independent predictors of biological aging when combined into a single model. Exploratory analyses suggested that experiencing IPV more strongly predicted a faster pace of aging than perpetrating IPV, and that physical IPV more strongly predictive than psychological IPV. These associations remained significant when controlling for relevant covariates. The results of the current study found that people who were more frequently involved in a romantic relationship had slower biological aging, and those who experienced physical IPV had particularly accelerated aging, suggesting both the presence of romantic relationships and the characteristics of ongoing romantic relationships have health relevance in early adulthood and midlife.

Abstract 1115

NATURALISTICALLY OBSERVED INTERPERSONAL PROBLEMS AND HEALTH OUTCOMES IN A RACIALLY DIVERSE SAMPLE OF EMERGING ADULTS WITH TYPE 1 DIABETES

Jacqueline Rodriguez-Stanley, Bachelor of Science, Psychology, Samuele Zilioli, Doctor of Philosophy, Psychology/ Family Medicine and Public Health Sciences, April Carcone, Doctor of Philosophy, Family Medicine and Public Health Sciences, Wayne State University, Detroit, MI, Richard B. Slatcher, Doctor of Philosophy, Psychology, University of Georgia, Athens, GA, Deborah A. Ellis, Doctor of Philosophy, Family Medicine and Public Health Sciences, Wayne State University, Detroit, MI

Objective. Diabetes management (e.g., blood glucose monitoring, medication adherence) is essential to prevent fluctuations of glucose outside the normal range, which if sustained, can lead to end-organ damage. Studies among children and adolescents suggest that family conflict can disrupt diabetes management. However, previous studies were based on global, retrospective self-report measures of interpersonal conflict. Further, only a few studies have focused on emerging adulthood, a crucial developmental period characterized by the transition from parental dependence to autonomy. This study fills these gaps of knowledge by investigating the links between interpersonal problems (IP; measured both via self-report and naturalistic observation), diabetes management, and glycemic control in a racially diverse sample of emerging adults with Type 1 diabetes (T1D). **Methods.** Sixty-eight young adults (age range: 17- 20 years, 46% African American) wore the Electronically Activated Recorder (EAR) for four days. The EAR recorded participants' acoustic environment, including their interpersonal conflictual interactions. During the daily monitoring period, participants also wore a continuous glucose monitor, which captured real-time levels of blood

glucose and the frequency of blood glucose tests (BGT). At home visits, participants completed the 24-Hour Recall Interview to assess behaviors of diabetes management and a subscale of the Hassles Scale, from which we derived a measure of self-report IP. **Results.** Neither self-report IP ($r = .22$, $p = .07$) or EAR-observed IP ($r = .13$, $p = .28$) were associated with mean blood glucose. In a hierarchical multiple regression, self-report IP at step 1 significantly predicted diabetes management ($R^2 = .143$, $p = .001$) and frequency of BGT ($R^2 = .103$, $p = .007$); however, entering EAR-observed IP at step 2 accounted for an additional 10% variance in diabetes management ($R^2 = .241$, $p < .001$) and 17% variance in frequency of BGT ($R^2 = .268$, $p < .001$). **Conclusions.** Our study shows that IP captured through naturalistic observation are associated with diabetes management among emerging adults with T1D. Accordingly, the present findings support the predictive validity of the EAR beyond traditional measures of interpersonal conflict and its potential to better capture the daily dynamics that link psychosocial stressors to health outcomes.

Abstract 1519

INTERGENERATIONAL TRANSMISSION OF ORIENTATION TO BODILY SIGNALS: THE TRANSGENERATIONAL IMPLICATIONS OF TRAUMA WITHIN THE MOTHER-DAUGHTER DYAD

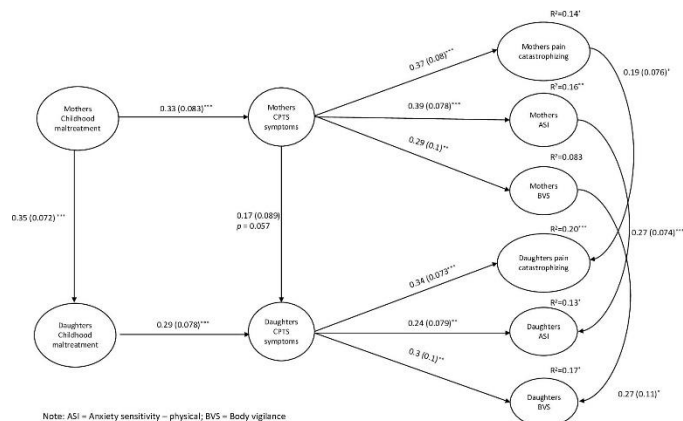
Noga Tsur, PhD, Social Work, Tel Aviv University, Tel Aviv, Israel

Orientation to bodily signals reflects the ways in which individuals interpret their bodily sensations. Such orientation is formed at initial stages of life, and develops within an interpersonal context. Findings reveal that trauma may alter the basic trust in one's body, which may result in catastrophic and fearful orientation towards bodily signals. However, not much is known regarding the link between early interpersonal trauma and the orientation towards the body as manifested within a family transgenerational context. This study examines the intergenerational link between childhood maltreatment, complex posttraumatic stress symptoms (CPTS symptoms), and a posttraumatic orientation to bodily signals among dyads of mothers and their young adult daughters.

One hundred and ninety-four mother-daughter dyads ($N=388$) completed self-administered questionnaires, assessing childhood maltreatment (CTQ), CPTS symptoms (ITQ), and orientation to bodily signals (pain catastrophizing, anxiety sensitivity-physical, body vigilance). Dyadic path analysis was used to test the hypothesized model.

The results show that orientation to bodily signals was associated with childhood maltreatment, through the mediation of CPTS symptoms among mothers ($0.28 > \text{indirect effect} > 0.13$; $p > 0.021$) and daughters ($0.21 > \text{indirect effect} > 0.11$; $p > 0.032$). Mothers' childhood maltreatment was associated with daughters' childhood maltreatment (effect=0.35; $p < 0.001$), and mothers' orientation to bodily signals was associated with daughters' orientation ($0.19 < \text{effect} < 0.27$; $p < 0.016$). Daughters' orientation to bodily signals was partially associated with mothers' childhood maltreatment through mothers' CPTS symptoms and orientation to body (indirect effect = 0.064; $p = 0.023$).

The findings of this study reveal that childhood maltreatment may have a long-lasting effect on the way individuals orient to their normal day-to-day bodily sensations, such as hunger, temperature, and pain. Such catastrophic and fearful orientation to bodily signals may be intergenerationally transmitted from mothers to their daughters, even in cases where the daughters did not experience trauma. Clinical implications will be discussed.



PAPER SESSION:
LATE BREAKING CLINICAL TRIALS
Friday, March 13 from 4:15 to 5:30 pm

Abstract 1867 NEURAL CORRELATES OF THE HEALTH BENEFITS OF GRATITUDE

Laura I. Hazlett, B.A., Naomi I. Eisenberger, Ph.D., Mona Moieni, Ph.D., Kate E. Byrne Haltom, B.A., Ivana Jevtic, B.A., Psychology, University of California, Los Angeles, Los Angeles, CA, Meghan L. Meyer, Ph.D., Psychological and Brain Sciences, Dartmouth College, Hanover, NH, Elizabeth C. Breen, Ph.D., Psychiatry and Biobehavioral Sciences, Steven W. Cole, Ph.D., Medicine, Psychiatry and Biobehavioral Sciences, Michael R. Irwin, M.D., Psychology, Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA

Gratitude has received growing interest as an emotion that can bring greater happiness and health. However, we know relatively little about the effects of gratitude on objective measures of physical health or the neural mechanisms that underlie these effects. Given the strong links between gratitude and giving behavior, and between giving behavior and health, gratitude may benefit health through the activation of a caregiving system (involving the ventral striatum (VS) and septal area (SA)), which downregulates amygdala responding and downstream physiological processes (e.g. inflammation). To test this hypothesis, 66 healthy female participants between 35-50 years of age, with access to the Internet and a computer, completed a six-week online gratitude intervention or control condition. Pre- and post-intervention, participants provided blood samples to assess inflammatory markers (circulating plasma levels and intracellular monocyte production in response to stimulation of TNF- α , IL-6), and reported on supporting behavior. Post-intervention, participants completed a gratitude task and a threat reactivity task designed to elicit amygdala activity in an fMRI scanner. There were no significant differences between those in the gratitude vs. control interventions in VS or SA activity during the gratitude task or in amygdala reactivity to the threat task. However, across the sample, results showed significant VS activity during the gratitude task. Moreover, those who showed larger pre-to-post increases in giving support to others showed a larger gratitude-related reduction in amygdala reactivity. Those who showed larger gratitude-related reductions in amygdala reactivity also showed larger pre-to-post reductions in percentage of TNF- α producing cells following stimulation. Furthermore, gratitude-related reduction in amygdala reactivity significantly mediated the relationship between supporting-giving and pre-to-post reductions in stimulated TNF- α production. These data suggest that giving-related reductions in threat responding may be one pathway that links experiences of gratitude with physical health via less response to inflammatory stimuli.

Abstract 1897 EFFECT OF A STRESS MANAGEMENT INTERVENTION ON 24H-HRV - RESULTS FROM THE MAN-GO RANDOMIZED CONTROLLED TRIAL

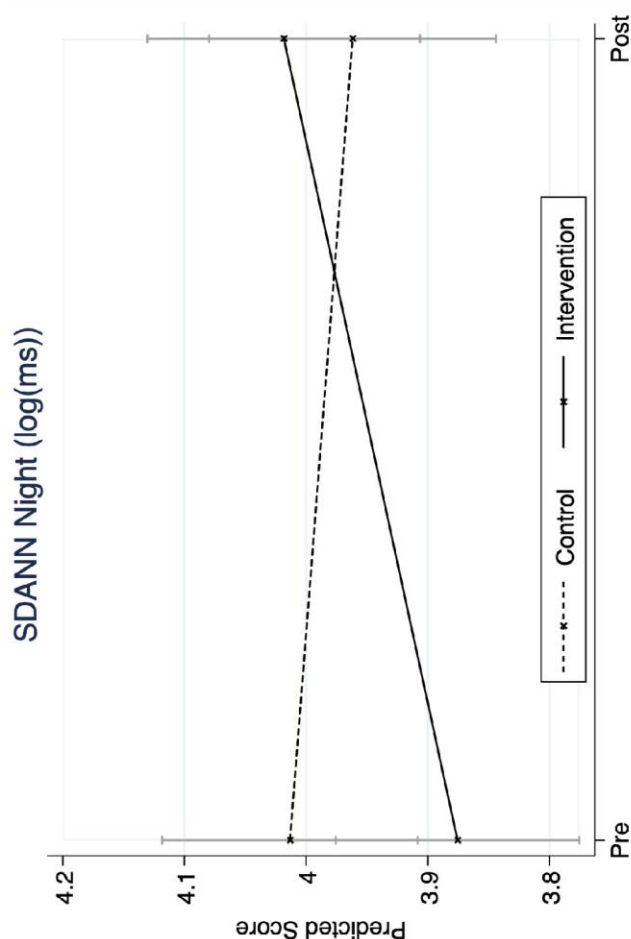
Elisabeth M. Balint, MD, Department of Psychosomatic Medicine and Psychotherapy, Ulm University Medical Center, Ulm, Germany, Peter Angerer, Prof., Institute of Occupational, Social and Environmental Medicine, Centre for Health and Society, Faculty of Medicine, Heinrich-Heine-University of Düsseldorf, Germany, Düsseldorf, Germany, Harald M. Guendel, Prof., Department of Psychosomatic Medicine and Psychotherapy, Ulm University Medical Center, Ulm, Germany, Birgit Marten-Mittag, PhD, Institute and Outpatient Clinic for Psychosomatic Medicine, Psychotherapy and Medical Psychology, Technical University of Munich, Munich, Germany, Munich, Germany, Marc N. Jarczok, PhD, Ulm University Medical Center, Department of Psychosomatic Medicine and Psychotherapy, Ulm, Germany

Objective: The central autonomic network (CAN) reflects the capacity of the body to adapt to environmental challenges such as work demands. The activity of the CAN is indexed by heart rate variability (HRV), which also correlates with measures of stress at work, physical and mental health and predicts mortality. A large, 12-month onsite randomized controlled trial to improve stress management skills at work was conducted to test the effects on HRV.

Material and methods: A total of 174 lower management employees from a truck production company in Southern Germany were randomized to intervention (IG) or waiting list control group (CG). The IG received a stress management training (two days of training, half day booster after 4 and 6 months). Due to missing measurements, dropout, cardiac diagnoses and artifacts, the final sample contained N=153 (pre) and N=145 (post) participants. Stress reactivity was assessed using the Stress Reactivity Scale (SRS) and 24h HRV measurement using Schiller MediLog were conducted pre and at 12 months post intervention. Average heart rate (HR), RMSSD, and SDANN were calculated for 24h and night time. Age-adjusted multilevel-mixed effects linear regressions with unstructured covariance and time as random coefficient as well as time X group interaction with according Likelihood-ratio tests were calculated.

Results: No statistically significant main effects were found for HR, HRnight, RMSSD, RMSSDnight. Also, models did not improve significantly when adding the interaction. Significant reduction in SDANN24 were found for both groups (no interaction). Significant increase for the IG and reduction for CG in SDANNnight were observed (LR $\chi^2(1) = 4.11$; $p = 0.04$). Significant decrease was observed for both groups in SRS (LR $\chi^2(1) = 4.63$; $p = 0.03$), but was more pronounced in the intervention group.

Conclusion: The training reduced successfully stress in both self-reported (SRS) and objective (psychophysiology HRV) measures. Though the effects are small and visible only during the night, it is highly remarkable that three days of intervention in one year of life achieved a measurable effect, as stress is only one of many factors that influence HRV. RMSSD also showed no effects, but RMSSD represents only parts of the Vagus nerve, while SDANN reflects a broader range of autonomic reactions including circadian variation.



Abstract 1908

MINDFULNESS-BASED COGNITIVE THERAPY IN PREGNANCY ON SLEEP QUALITY: SECONDARY ANALYSIS FROM A RANDOMIZED CONTROLLED TRIAL

Lianne M. Tomfohr-Madsen, PhD, Ivan Sedov, PhD, Anna MacKinnon, PhD, Psychology, Gerald Giesbrecht, PhD, Pediatrics, University of Calgary, Calgary, AB, Canada

Background: Poor sleep quality during pregnancy is prevalent, commonly persists into the postpartum period and has been associated with a number of poor maternal and child outcomes including elevated risk of preterm birth and postpartum depression. Women are hesitant to take medication during pregnancy leaving many without evidence-based treatments for sleep problems. Mindfulness interventions have been shown to improve sleep quality in nonpregnant populations, but the impact of mindfulness training on sleep in pregnancy has rarely been investigated. A single-blind randomized controlled trial (RCT) was conducted to evaluate the effectiveness of an 8-week modified Mindfulness-based Cognitive Therapy (MBCT) intervention delivered during pregnancy on psychological distress and physiological outcomes. This paper presents secondary impacts on subjective sleep quality.

Methods: A community sample of pregnant women who self-identified as experiencing high levels of psychological distress were randomized into the experimental MBCT (n=28) or control treatment as usual (n=32) conditions. Participants completed questionnaires assessing symptoms of subjective sleep quality using online survey software during lab visits at enrolment (before allocation), immediately following the intervention, and follow-up 3 months postpartum.

Results: Using an intent-to-treat approach, multilevel modeling indicated that there was a significant effect of MBCT treatment on overall PSQI scores ($b = -6.30$, $SE = .60$, $p = .011$) but that the effect was moderated by baseline PSQI ($b = -.94$, $SE = .19$, $p = .00002$), such

that women who entered the trial with worse subjective sleep quality and received active treatment had the greatest improvement in sleep quality in the post intervention period.

Conclusions: In women with high levels of psychological distress in pregnancy, training in mindfulness was associated with improvements in subjective sleep quality. Further research is warranted to examine whether these effects confer secondary benefits for maternal mood.

Abstract 1922

FEASIBILITY AND ACCEPTABILITY OF A MINDFULNESS-BASED INTERVENTION TO ADDRESS PTSD IN TRAUMA-EXPOSED, HOMELESS WOMEN

Dana Rose Garfin, PhD, Sue & Bill Gross School of Nursing, Alexandra Amador, Undergraduate Student, Krista Sadiwa Ruivivar, Undergraduate Student, Jessica Osorio, BA, Regine Deguzman, BA, Adriana Jones, BA, Department of Psychological Science, Adeline M. Nyamathi, PhD, Sue & Bill Gross School of Nursing, University of California, Irvine, Irvine, CA

Homeless women are at high risk for trauma-exposure, posttraumatic stress disorder (PTSD), and associated physical health problems. Such health disparities can be exacerbated as PTSD can be costly and difficult to treat. Low-cost mindfulness-based interventions (MBI), such as Mindfulness-based Stress Reduction (MBSR) have demonstrated effectiveness in improving health outcomes and can be implemented in community-based, group settings. Yet few studies have evaluated the acceptability and feasibility of MBIs with trauma-exposed homeless women or adapted them for cultural appropriateness and sensitivity. Between 9/29/19-10/16/19, using a community-participatory approach, we conducted a mixed-methods acceptability and feasibility study with 28 trauma-exposed, homeless women. Women participated in focus groups (N=4) and completed a survey. Key components of MBSR (e.g., body scans, gentle yoga, meditation), were demonstrated using a theater-style approach. Participants were, on average 30.3 years old ($SD=8.6$). All 28 had been diagnosed with a substance use disorder, 22 (78%) had an additional doctor diagnosed mental health condition. Trauma-exposure in the sample was exceedingly high. Common trauma exposures included physical assault (n=27; 96%), sexual assault (n=24, 86%), assault with a weapon (n=23, 82%), and sudden violent death (n=13, 46%). Almost 90% of women (n=25) met criteria for probable-PTSD. Quantitative data revealed great enthusiasm for the MBSR program: 89% of participants endorsed that MBSR would be "a great deal" useful for them and 10% "somewhat" useful. Participants endorsed that using gentle yoga (86%), meditation (86%), body scans (71%), worksheets (89%), and discussion with trainers (82%) would help them a "great deal". Focus group recordings were transcribed and analyzed using open coding techniques. Key themes that emerged included adopting language so that it was culturally appropriate and non-triggering; a focus on explaining mechanisms of action; incorporation of art; accountability groups to help with home practice fidelity; scaffolding of practices (e.g., starting with shorter meditations); compassion from the trainer; and non-monetary incentives (e.g., certificate of completion). Results informed the design of a modified-MBSR program for trauma-exposed, homeless women. Implications for reducing health disparities will be discussed.

PAPER SESSION:

LIFECOURSE TRANSITIONS AND BIOMARKERS Friday, March 13 from 1:30 to 2:30 pm

Abstract 1764

LIFETIME TRAUMA EXPOSURE AND HORMONAL SENSITIVITY IN THE MENOPAUSE TRANSITION

Ashley A. Balsom, B.Sc. (Hons) Psychology, Laurie Sykes Tottenham, Ph.D., Julia Grummisch, Ph.D., Jennifer L. Gordon, Ph.D., Psychology, University of Regina, Regina, SK, Canada

Background: The menopause transition (perimenopause) constitutes the 5-6 years leading up to the cessation of menstruation and is characterised by an increase in estradiol fluctuation and an associated two-fold increased risk of depression and emergence of vasomotor symptoms (i.e. hot flashes and night sweats). Mounting research suggests that exposure to traumatic experiences may alter one's neurobiological response to reproductive hormones; the current study therefore examined lifetime trauma exposure in relation to perimenopausal mood sensitivity to reproductive hormone changes and vasomotor symptoms.

Methods: Participants included 101 perimenopausal women from the community, ages of 45-55. At baseline, participants completed a battery of questionnaires, including the Trauma History Questionnaire (THQ), which assesses lifetime exposure to traumatic events. They also completed the Center for Epidemiologic Studies-Depression Scale (CES-D) once weekly for 12 weeks and collected a urine sample for the measurement of estrone-3-glucuronide (E1G), a urinary metabolite of estradiol. Finally, they completed a 24-hour diary to record vasomotor symptoms. For each participant and across the 12 weeks, a Pearson correlation between the absolute week-to-week change in E1G and weekly mood was conducted, providing a coefficient reflecting each participant's mood sensitivity to weekly fluctuation in E1G. Scores on the THQ were then examined in relation to this sensitivity coefficient, as well as vasomotor symptoms.

Results: Total THQ score was positively correlated with mean scores on the CES-D, $r(98) = .370, p = .001$, as well as the coefficient reflecting mood sensitivity to E1G change, $r(94) = .375, p = .001$. Conversely, total THQ score was associated with less bother associated with vasomotor symptoms, $\beta(SE) = -0.03(0.01), p = .018$, as well as fewer moderate hot flashes, $\beta(SE) = -0.12(0.04), p = .006$. These findings remained significant when adjusting for potential confounding variables, including E1G levels and body mass index. Trauma exposure was unrelated to the number of mild or severe hot flashes reported ($ps > .05$).

Discussion: These findings suggest that lifetime exposure to traumatic events may alter an individual's psychological and physiological responses to the reproductive hormone changes that characterise the menopause transition.

Abstract 1685

THE RELATIONSHIP BETWEEN VASOMOTOR SYMPTOMS AND THE CORTISOL AWAKENING RESPONSE DURING THE MENOPAUSE TRANSITION

Tianna Sauer, BSc, Laurie Sykes Tottenham, PhD, Julia A. Grummisch, MSc, Jennifer L. Gordon, PhD, Psychology, University of Regina, Regina, SK, Canada

Background: Triggered by advancing age, the menopause transition (i.e. perimenopause) is characterized by menstrual irregularity and is accompanied by severe hormonal changes, most notably, exposure to extreme estradiol levels. Vasomotor symptoms (VMS), including hot flashes and night sweats, are one of the most common symptoms of the menopause transition and are associated with a poorer cardiovascular risk profile. Though the mechanisms underlying this relationship are poorly understood, alterations of the Hypothalamic-Pituitary-Adrenal (HPA) axis have been hypothesised to play a role. However, the current literature examining VMS and cortisol secretion is conflicting. The aim of this study was to clarify the relationship between VMS and HPA axis activity in perimenopausal women, examining both between- and within-subject effects of VMS, using a repeated measures design.

Methods: 101 perimenopausal women between the ages of 45 and 55 were included in the study. Once a week for 12 weeks, participants collected two saliva samples for the measurement of the cortisol awakening response (CAR) – immediately upon waking and 30 minutes post-waking – and provided a urine sample the following morning for the measurement of the urinary metabolite of estradiol (estrone-3-glucuronide - E1G). A 24-hour hot flash diary was begun the evening prior to each saliva collection day, and self-reported

questionnaires on mood (CES-D) and sleep quality (modified PSQI) were completed on each saliva sample collection day.

Results: Significant between-subject effects of VMS parameters on the CAR were observed: total mean number of hot flashes ($\beta(SE) = -0.05 (.01), p = .03$), mean VMS bother ($\beta(SE) = -0.04 (.06), p = .04$), and mean VMS score ($\beta(SE) = -0.04 (.003), p = .04$) were all associated with a blunted mean CAR. Results remained significant despite statistically adjusting for mean E1G levels and self-reported sleep quality. In contrast, the within-subject effects of weekly VMS change and weekly CAR were not significant ($p > .05$).

Conclusion: Findings suggest that women who report more frequent, more severe, and more bothersome VMS exhibit a blunted CAR, which may help explain the link between VMS and increased cardiovascular disease risk. However, within a given woman, short-term fluctuations in VMS parameters do not appear to be accompanied by changes in the CAR.

Abstract 1330

THE TESTOSTERONE-TO-ESTRADIOL RATIO AND DEPRESSIVE SYMPTOMS DURING THE MENOPAUSE TRANSITION

Bethany Sander, current BSc honours student, Amira Muftah, BSc, Laurie Sykes Tottenham, PhD, Jennifer L. Gordon, PhD, Psychology, University of Regina, Regina, SK, Canada

Background: The menopause transition is associated with an increased risk of depression. While it is hypothesized that the changing perimenopausal hormonal environment may play a role, this hypothesis requires testing. The current analysis examined changes in the relative androgenicity of the hormonal environment (that is, the ratio of testosterone to estradiol) as a potential contributor to depressed mood in the menopause transition.

Methods: 50 non-depressed perimenopausal women ages 45-55 were recruited for this study. Once every three weeks, for a total of four times, the women completed the Centre for Epidemiological Studies-Depression (CES-D) scale for the measurement of depressive symptoms, and provided a first-morning urine sample for the measurement of urinary testosterone (T) as well as estrone-3-glucuronide (E1G), a urinary metabolite of estradiol. The within- and between-person effects of T, E1G, and the T/E1G ratio on CES-D score was examined. Self-reported sleep quality and vasomotor symptoms were also assessed at each of the four time points as these bothersome somatic symptoms may contribute to depressed mood.

Results: Within-person analyses using multilevel modelling revealed that a higher person-centered T/E1G ratio was positively associated with CES-D score ($\beta(SE)=1.3(0.6), p=.029$) but not sleep quality or vasomotor symptoms ($ps>.05$). Levels of T and E1G, each examined on their own, were unrelated to depressive symptoms. Between-person analyses, carried out using Pearson correlations, revealed that mean T/E1G ratio, averaging the 4 measurement points, was positively correlated with mean severity of vasomotor symptoms ($r=0.32, p<.01$) and negatively correlated with mean sleep quality ($r=-0.30, p<.01$) but was unrelated to mean depressive symptoms ($p>.05$).

Conclusion: These results suggest that, within the context of the menopause transition, times that are characterised by a higher T-to-estradiol ratio may be associated with higher depressive symptoms. Furthermore, perimenopausal women with a higher level of T relative to estradiol may experience more sleep difficulties and vasomotor symptoms.

Abstract 1140

SEXUAL SATISFACTION, RELATIONSHIP SATISFACTION, AND THE ROLE OF TESTOSTERONE ACROSS THE TRANSITION TO PARENTHOOD

Hannah Khoddam, MSc, Hannah Rasumussen, MA, Geoffrey Corner, MA, Darby Saxbe, PhD, Psychology, University of Southern California, Los Angeles, CA

Declines in relationship satisfaction following the birth of a child have been consistently found across multiple studies. Understanding potential prenatal factors that predict relationship decline over the transition to parenthood may inform interventions to prevent this decline. Within a longitudinal study of couples transitioning to first-time parenthood, we examined prenatal paternal testosterone in expectant fathers and both partners' prenatal sexual satisfaction as predictors of change in relationship satisfaction from pregnancy to six months postpartum. We invited 61 cohabitating, heterosexual couples to the lab to provide testosterone and report on their sexual and relationship satisfaction prenatally. Study hypotheses were tested using path models and actor-partner interdependence models. The APIM accounts for the interdependence of dyadic data and allows for independent estimation of the impact of a person's characteristics on their own outcomes, *actor* effects, and the impact of a person's characteristics on their partner's outcomes, *partner* effects. We found that relationship satisfaction decreased across the transition to parenthood for mothers but not fathers. We also found that neither prenatal testosterone nor prenatal sexual satisfaction alone predicted changes in relationship satisfaction for mothers or fathers. However, prenatal testosterone moderated associations between both partners' prenatal sexual satisfaction and mothers' (but not fathers') changes in relationship satisfaction. These results point to the importance of considering biological and behavioral data together when investigating couple dynamics across the transition to parenthood. The current investigation is an important first step in understanding how biological and psychosocial indices of relationship satisfaction in couples work together across the transition to parenthood. Higher testosterone in expectant fathers might be an important factor in predicting changes in their partner's relationship satisfaction only when accounting for prenatal sexual satisfaction. It is important for future research on expectant and new parents to include both fathers and mothers, integrate hormonal, self-report, and behavioral data, and further explore the mechanisms by which testosterone might shape relationship quality during a challenging and meaningful life stage.

Table 1.

Means and standard deviations for study variables

	Mothers <i>M (SD)</i>	Fathers <i>M (SD)</i>	<i>t</i> -test ^b
Partner Variables			
Change in Relationship Satisfaction ^a	-2.93 (10.55)	-2.03 (8.26)	-0.65
Prenatal Sexual Dissatisfaction	27.41 (15.00)	26.59 (13.90)	0.51
Prenatal Relationship Satisfaction	137.82 (11.82)	134.34 (13.94)	2.47*
Postpartum Relationship Satisfaction	134.89 (14.44)	132.31 (14.72)	2.01
Prenatal Age	31.44 (4.43)	33.57 (6.29)	-3.32**
Dyadic variables			
Father's Prenatal Testosterone	54.67 (26.09)		
Days Pregnant	205.06 (26.21)		
Baby Age at Postpartum visit	28.82 (2.82)		

Note. ^a prenatal relationship satisfaction subtracted from postpartum relationship satisfaction, i.e., positive values indicate increases in relationship satisfaction; ^b paired samples *t*-test.

p* < .05, *p* < .01, ****p* < .001

Table 2.

Bivariate correlations of main study variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 Days Pregnant	---											
2 Baby Age	-.11	---										
3 F PreN. Testosterone	.06	.11	---									
Mother self-report variables												
4 M Change in Relationship Sat.	.15	-.20	-.08	---								
5 M PreN. Sexual Dissatisfaction	.06	-.15	.23	.08	---							
6 M PreN. Relationship Sat.	.17	.10	-.27*	-.17	-.55***	---						
7 M Post P. Relationship Sat.	.25	-.06	-.28*	.59***	-.40**	.69***	---					
8 M PreN. Age	-.12	.04	-.08	-.26*	.13	-.06	-.24	---				
Father self-report variables												
9 F Change in Relationship Sat.	-.06	-.09	-.16	.36**	.05	.09	.34**	-.17	---			
10 F PreN. Sexual Dissatisfaction	.08	-.37**	.25	.05	.62***	-.39**	-.28*	.11	.02	---		
11 F PreN. Relationship Sat.	.21	.26*	-.25	.11	-.46***	.63***	.61***	-.16	-.20	-.55***	---	
12 F Post P. Relationship Sat.	.16	.19	-.32*	.31*	-.41**	.66***	.77***	.24	.37**	-.51***	.84***	---
13 F PreN. Age	-.10	-.08	-.22	-.15	.21	.01	-.10	-.61***	.07	-.17	-.13	-.08

Note. Baby Age measured in months; F = father; PreN. = prenatal; M = mother; Sat. = Satisfaction; Post P. = Post Partum. Italics represent across partner correlations on the same variable.

p* < .05 (two tailed), *p* < .01 (two tailed), ****p* < .001 (two tailed).

Table 3.

Unrestricted model with a between-dyads moderator

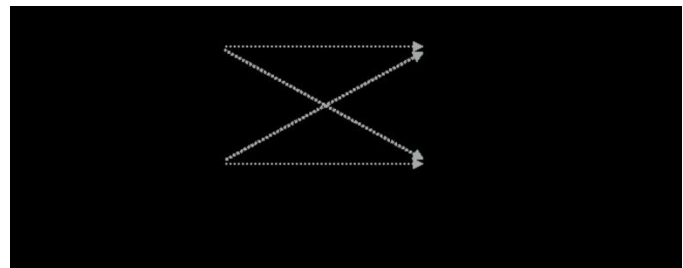
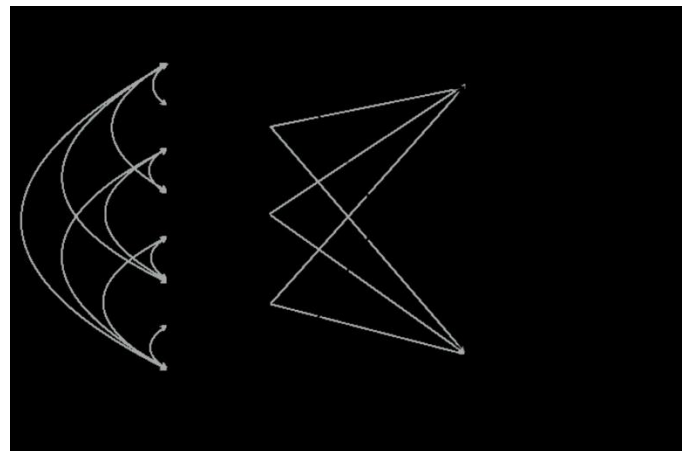
Effect	Coefficient	SE	<i>p</i>
Intercept			
Mother	28.58	21.08	.27
Father	9.84	20.18	.63
Actor effects of sexual dissatisfaction			
Mother	0.00	0.15	.99
Father	-0.09	0.11	.42
Partner effects of sexual dissatisfaction			
Mother	0.08	0.13	.57
Father	0.10	0.10	.30
Prenatal Testosterone			
Mother	-0.09	0.06	.12
Father	-0.06	0.05	.24
Actor sexual dissatisfaction by T			
Mother	-0.02	0.01	.02
Father	0.01	0.01	.22
Partner sexual dissatisfaction by T			
Mother	0.02	0.01	< .01
Father	-0.01	0.01	.17

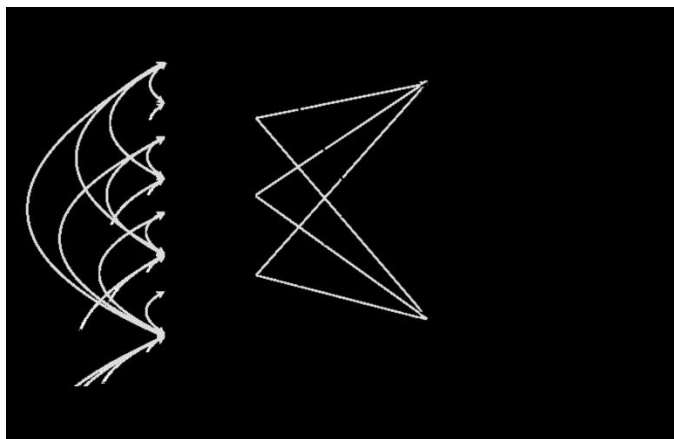
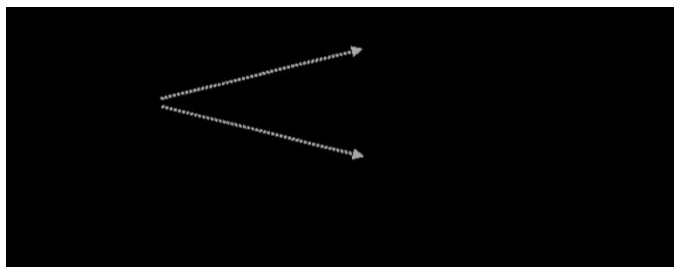
Note. *N* = 61 couples; Bold = significant paths. The outcome variable is change in relationship satisfaction from prenatal to post partum measurements. Model controls for prenatal relationship satisfaction, prenatal age, days pregnant and baby age post partum.

Table 4.

Actor-Partner Interdependence Moderation Submodels

Model	Effect interacting with T				Fit			
	Mother actor by moderator	Mother partner by moderator	Father actor by moderator	Father partner by moderator	χ^2	df	<i>p</i>	SABIC
Unrestricted	-0.02*	0.02**	0.01	-0.01	-	0	-	842.99
Interaction effects zero	0	0	0	0	16.14	4	<.01	855.27
Indistinguishable interaction effects	0.00	0.01	0.00	0.01	11.76	2	<.01	852.81
Actor Only	0.00	0	0.00	0	15.30	2	<.001	856.35
Partner Only	0	0.01	0	0.00	9.83	2	<.01	850.88
Couple Model	0.00	0.00	0.00	0.00	14.05	2	<.001	855.11
Contrast Model	-0.02**	0.02**	0.01	-0.01	0.74	2	.69	841.80





ABP, extending laboratory reactivity findings to the daily lives and natural emotional experiences of individuals. The magnitude of this within-person association is similar to that found between trait anger and ABP on a between-person basis. This field could be strengthened by assessing inter-individual variability in ABP reactivity to emotion, determining inter- and intra-individual moderators (e.g., coping), examining differential associations of discrete negative emotions (e.g., anger vs anxiety vs stress) with ABP, and standardizing EMA-ABP protocols. Although the effect is small, to the extent that repeated emotion-related cardiovascular reactivity may contribute to cardiovascular disease risk, identifying daily life triggers of emotion and ABP fluctuation is important. Future research could explore the use of ecological momentary interventions for modifying reactivity to triggers.

Abstract 1189

THE EMPEROR HAS NO CORTISOL: FREQUENCY OF ESTIMATION ERRORS IN BIOMARKER STUDIES

Suzanne C. Segerstrom, PhD, MPH, Psychology, University of Kentucky, Lexington, KY, Ian A. Boggero, PhD, Behavioral Medicine and Clinical Psychology, Cincinnati Children's Medical Center, Cincinnati, OH

Biomarker studies are costly in supplies, assays, and participant effort. Collecting the fewest feasible number of biomarkers decreases these costs but also desirable study characteristics including sample size and measurement reliability. Such cost-effective design decisions in combination with small underlying effect sizes can lead to misestimation of effects. This study simulated 100,000 datasets for each of 212 study designs used in empirical studies of psychosocial correlates of the cortisol awakening response (CAR). Each dataset had that study's sample size, estimated CAR reliability based on the number of days of sampling in that study (Helhammer et al., 2007), and underlying true effect size derived from meta-analysis ($r = .10$; Boggero et al., 2017). Figure 1 shows the distribution of effects from one sample design with $N = 130$ and 2 days of CAR sampling. Probability of **sign** error for any given study design was the percent of 100,000 simulated effects that were in the opposite direction from the "true" effect; the average across designs was 21% for CAR increase and 15% for CAR AUC. Some designs were associated with probability of sign error as high as 40%. Probability of **magnitude** error was the percent of effects more than .10 different from the "true" effect and was double that of sign effects (42% for CAR increase and 30% for CAR AUC). Some designs had a probability of magnitude error as high as 80%. Figure 2 shows the relationships among sample size (x axis), reliability (number of sampling days; dot color), probability of sign error (y axis), and reported effect size in the study (dot size). Studies with designs more likely to result in misestimation also reported larger effect sizes ($r = .44$), a potential consequence of the combination of misestimation and publication bias. Although there are no shortcuts to reliable estimation of effects in biomarker studies, there can be efficiencies in design decisions that balance sample size, number of sampling days, and choice of measure. Ultimately, this simulation tells a cautionary tale for all correlational studies using small samples and unreliable measures: "Your results may vary."

PAPER SESSION: METHODOLOGICAL ADVANCES ACROSS THE BIOMARKER SPECTRUM

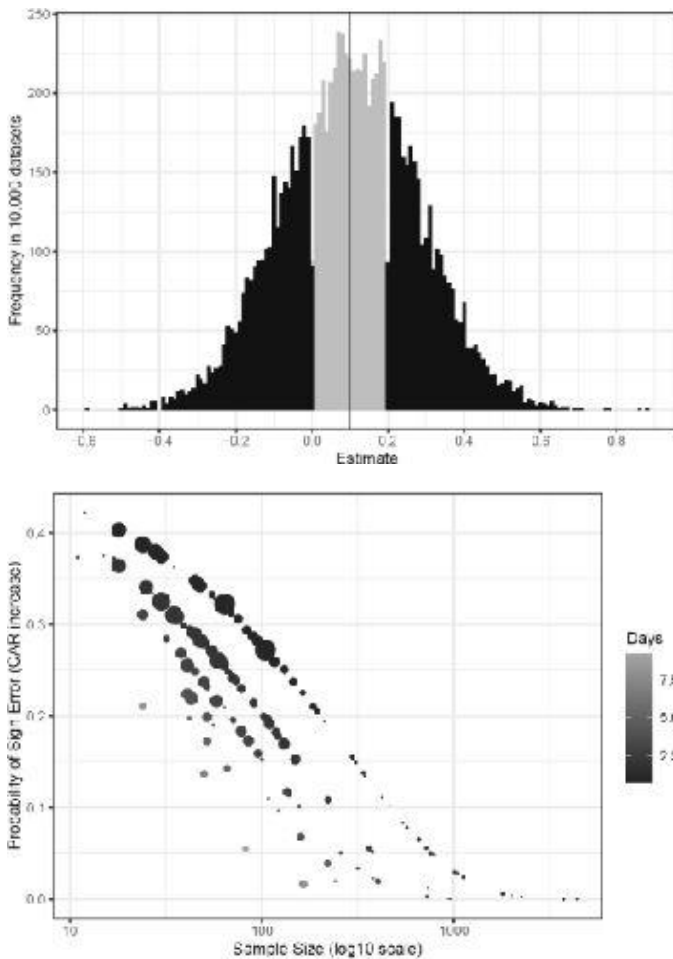
Thursday, March 12 from 10:30 to 11:30 am

Abstract 1791

USING OVER 140,000 MOMENTS OF NEGATIVE EMOTION AND AMBULATORY BLOOD PRESSURE TO ADVANCE THE FIELD: A SYSTEMATIC REVIEW AND META-ANALYSIS

Nataria T. Joseph, PhD, Elvina Chow, MA, Psychology, Pepperdine University, Malibu, CA, Laurel M. Peterson, PhD, Psychology, Bryn Mawr College, Bryn Mawr, PA, Thomas W. Kamarck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Morgan Clinton, H.S. Diploma, Madison DeBruin, H.S. Diploma, Psychology, Pepperdine University, Malibu, CA

Background: For over two decades, researchers have utilized ecological momentary assessment (EMA) and ambulatory blood pressure (ABP) methodology to examine the acute associations between negative emotion and blood pressure as they unfold in daily life moments, but no meta-analysis has been conducted to quantify the magnitude of this association across studies. We conducted this systematic review and meta-analysis to quantify this association, review strengths and weaknesses in conceptual and measurement approaches, and provide recommendations. Methods: We searched databases (PsychInfo, Pubmed) using the search string (blood pressure) AND (ecological momentary assessment or experience sampling or ambulatory or daily life) AND (emotion or affect or mood or feeling) and identified 19 eligible studies for the systematic review. We obtained data from 14 studies for the meta-analysis (total $n = 2,484$; total number of observations = 144,008). Results: Random effects meta-analyses demonstrated small effect r s between momentary negative emotions and systolic ABP, $r = .06$, CI: .04-.08, $p < .001$, and diastolic ABP, $r = .05$, CI: .03-.07, $p < .001$. Egger's test, Kendall's tau (.27 and .02), and funnel plots did not suggest publication bias. Meta-regression follow-up found that scales capturing multiple emotions were associated with larger ABP effects than single-emotion items ($ps < .05$). Conclusions: There is an overall small association between momentary negative emotion and



Abstract 1684

SYSTEMIC INFLAMMATION COVARIES WITH THE LOCAL STRUCTURAL CONNECTOME WITHIN SUSPECTED INTEROCEPTIVE PATHWAYS

Thomas E. Kraynak, MS, Anna L. Marsland, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Timothy D. Verstynen, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA. Communication between the brain and peripheral mediators of inflammatory physiology is implicated in diverse psychological, behavioral, and physiological processes important for health. Mediators of inflammatory physiology, including interleukin(IL)-6 and other cytokines, associate with microstructural integrity in white matter pathways linking large-scale brain networks that support these processes. However, it is unclear to what extent peripheral inflammation associates with individual white matter fiber trajectories and their respective terminal endpoints in the brain. Accordingly, we used a data-driven approach to map the white matter pathways in which the local structural connectome associates with individual differences in circulating IL-6. Participants (138 midlife adults; 67 women; age 30 to 51) underwent a fasting blood draw and diffusion tensor imaging (DTI). DTI data were reconstructed in a common stereotaxic space using q-space diffeomorphic reconstruction to obtain the spin distribution function (SDF), and connectometry analyses (Yeh, Badre, & Verstynen, 2016) were conducted to map the white matter pathways in which the local connectome SDF associated with individual differences in circulating IL-6. Additional analyses were conducted adjusting for age, sex, body mass index, and motion. Results showed that circulating IL-6 covaried negatively with the local connectome in white matter fascicles along the corticothalamic-brainstem tract (FDR-corrected $p < .05$). Tract endpoints of these fascicles were observed near the brainstem,

thalamus, and posterior insula. IL-6 also covaried negatively with the local connectome in the cerebellar peduncle and corpus callosum. Findings were similar when adjusting for a priori covariates. In contrast, IL-6 did not covary positively with the local connectome in any fascicles. Taken together, these findings are consistent with prior studies reporting negative associations between systemic inflammation and white matter architecture in the brain. Moreover, they complement experimental models that report effects of inflammation on microstructural properties within visceral interoceptive pathways. Finally, we speculate these findings support a role for a previously characterized “neural route” linking the brain and peripheral inflammatory physiology across health and disease contexts.

Abstract 1804

DISTINCT BRAIN-GUT MICROBIOME ALTERATIONS IN FEMALE IBS SUBJECTS: AN ANALYSIS OF FUNCTIONAL BRAIN NETWORKS AND FECAL AMINO-ACID METABOLITES

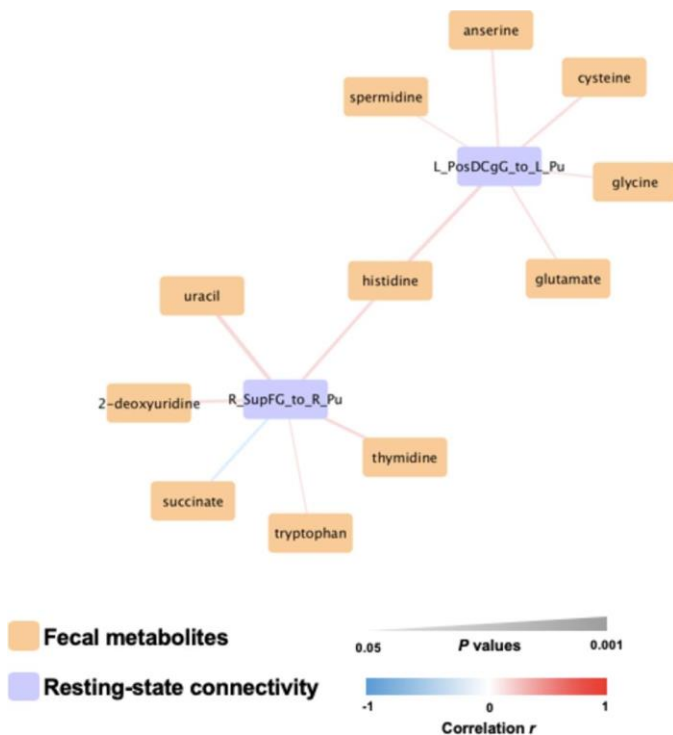
Vadim Osadchiy, BS, Emeran A. Mayer, MD, PhD, Kan Gao, BS, Gastroenterology, David Geffen School of Medicine at UCLA, Los Angeles, CA, Jennifer S. Labus, PhD, Gastroenterology, David Geffen School of Medicine, Los Angeles, CA, Bruce Naliboff, PhD, Lin Chang, MD, Jonathan Jacobs, MD, PhD, Arpana Gupta, PhD, Gastroenterology, David Geffen School of Medicine at UCLA, Los Angeles, CA

Background: Evidence from preclinical and clinical studies suggests that alterations in brain-gut-microbiome (BGM) interactions play an important role in the pathogenesis of irritable bowel syndrome (IBS). Here, we use a systems biology approach, leveraging neuroimaging and fecal metabolite data to characterize these BGM interactions.

Methods: Fecal samples and resting state fMRI imaging were obtained from 138 female subjects (99 IBS, 39 healthy controls (HCs)). Partial least squares discriminant analysis (PLS-DA) was conducted to explore group differences. Metabolites and brain regions with values of the first principal component of variable interest in PLS-DA greater than 1.0 were assessed by Student's t-test. We then performed partial correlation analysis between significantly changed metabolites and neuroimaging data. All correlational tests were performed controlling for age, BMI, and diet; results are reported after FDR correction, with $q < .05$ as significant.

Results: Compared to HCs, IBS showed increased connectivity of the putamen with the default mode and somatosensory networks. Metabolite pathways involved in nucleic acid and amino acid metabolism differentiated the two groups. Only a subset of metabolites (Figure 1), primarily amino acids, were associated with IBS-specific brain changes, including tryptophan, glutamate, and histidine. Histidine was the only metabolite positively associated with both IBS-specific alterations in brain connectivity.

Conclusions: Our findings suggest a role for several amino acid metabolites in modulating brain function in IBS. These metabolites may alter brain connectivity directly, by crossing the blood-brain-barrier, or indirectly through peripheral mechanisms. Previous work in IBS subjects has demonstrated that the gut microbiota can impact visceral sensitivity through alteration of putamen connectivity. This is the first study to integrate both neuroimaging and fecal metabolite data supporting the BGM model of IBS, building the foundation for future mechanistic studies into the influence of gut microbial metabolites on brain function in IBS.



**PAPER SESSION:
MODERATORS OF ACUTE STRESS RESPONSES IN THE
LAB**

Thursday, March 12 from 4:15 to 5:30 pm

Abstract 1784

**FRONTOSTRIATAL BRAIN ACTIVATION DURING
MENTAL STRESS PREDICTS PROGRESSION OF
CARDIOMETABOLIC RISK**

Ben Allen, PhD, Psychology, University of Tennessee, Knoxville, TN, John R. Jennings, PhD, Psychiatry & Psychology, Matthew F. Muldoon, MD, School of Medicine, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Cardiometabolic risk refers to a set of interconnected factors of vascular and metabolic origin associated with both cardiovascular disease and various brain disorders. While midlife cardiometabolic risk is associated with future brain dysfunction, emerging evidence suggests that alterations in autonomic and central nervous system function may precede increases in cardiometabolic risk. The present study tested whether patterns of cerebral blood flow responses to mental stress predict increases in overall cardiometabolic risk. A community sample of 109 middle-aged adults with resting systolic blood pressure between 120-139, diastolic blood pressure between 80-89, or both, underwent pseudocontinuous arterial spin labeling to quantify cerebral blood flow responses to mental stress tasks. Cardiometabolic risk and cerebral blood flow measurements were collected at baseline and at a two-year follow-up. Regression analyses showed that greater frontostriatal cerebral blood flow responses to mental stress predicted higher cardiometabolic risk at follow-up ($\beta = 0.26$ [95% C.I. = 0.07, 0.45], $t = 2.72$, $p = 0.008$, $\Delta R^2 = 0.03$). These findings were specific to frontostriatal brain regions, as frontoparietal, insular-subcortical, and total cerebral blood flow did not predict progression of cardiometabolic risk. Moreover, cardiometabolic risk did not predict frontostriatal cerebral blood flow responses two years later. Frontostriatal brain function during mental stress may precede and possibly forecast the progression of cardiometabolic risk.

Abstract 1380

**SELF-CONTROL DURING AND AFTER COUPLES'
DISCUSSIONS: DOES HIGH-FREQUENCY HEART RATE
VARIABILITY INDEX SELF-REGULATORY CAPACITY IN
A DYADIC CONTEXT?**

Theodore Robles, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA, Ben Shulman, Ph.D., Indigo Ag, Boston, MA

Self-control challenges, such as resisting tempting foods, may lead to relationship conflict. However, previous studies have relied on retrospective self-reports, hypothetical scenarios and false-feedback provocations. We tested how a self-control challenge affected the quality and consequences of couples' interactions and examined participants' high-frequency heart rate variability (HF-HRV), to test theories that HF-HRV may index self-regulation capacity and effort. We hypothesized that in romantic couples, resisting a tempting food (chocolate chip cookies vs. radishes in the control condition) would lead partners to have more negative interactions, less positive feelings, and more aggressive behaviors towards one another. We also hypothesized that higher baseline HF-HRV would be associated with less negative interactions, and more positive and less aggressive feelings towards one another. In addition, we hypothesized that the effect of resisting a tempting food on affect and behavior would be weaker among participants with higher baseline HF-HRV.

Undergraduate couples ($N = 148$ individuals in 74 couples) were randomly assigned to sit with a bowl of cookies (or radishes), and not eat any. In this design, neither, one, or both partner(s) were assigned to the cookie condition. Both partners' HF-HRV was recorded at baseline and throughout the laboratory session. Afterwards, they discussed points of disagreement and appreciation in their relationship. The self-control challenge worsened observer ratings of their behavior, self-reports of affect and attitudes, and a behavioral measure of aggression. Many effects were stronger for couples with lower relationship quality. This study provides experimental evidence that facing a self-control challenge can worsen couples' interactions, and their feelings afterwards, and may generalize to the 40% of adults who report trying to lose weight. While participants with higher baseline HF-HRV acted more positively during the appreciation discussion, we found little support for the hypothesized associations between HF-HRV and self-regulation. Thus, our findings add to the mixed results in the few studies of HF-HRV and self-regulation in social situations.

Abstract 1152

**THE RELATIONSHIP BETWEEN PERSEVERANCE AND
CARDIOVASCULAR REACTIVITY TO ACUTE
PSYCHOLOGICAL STRESS**

Anna C. Whittaker, PhD, Division of Sport, Health & Exercise Research & Education, University of Stirling, Stirling, NA, United Kingdom, Erika Steward, MSc, Sport, Exercise & Rehabilitation Sciences, University of Birmingham, Birmingham, NA, United Kingdom

Background: Difficulties with motivation and behavioural regulation is associated with attenuated cardiovascular responses to acute stress. For example, high impulsivity and risk-taking have been associated with blunted cardiovascular reactivity. More recently, we have shown preliminary evidence in a moderate sample that low perseverance in terms of fewer impossible puzzle attempts related to low BP reactivity to acute stress.

Aim: The present study investigated the relationship between perseverance and cardiovascular stress reactions in depth by examining both self-reported and behavioural perseverance and cardiovascular reactivity to acute stress.

Method: Participants ($N=147$; 85% female; 69% white) completed a self-report Grit questionnaire to measure perseverance, then heart rate (HR) and blood pressure (BP) were measured at rest and in response to a 10-minute mental arithmetic and a 4-minute cold pressor (CP) socially evaluated stress task followed by an unsolvable puzzle tracing task. The number of impossible puzzle attempts and time spent on the

puzzle as well as time spent persevering at the CP task were recorded as behavioural perseverance measures.

Results: Self-reported perseverance was not related to stress reactivity. However, less time spent on the insoluble puzzle was associated with blunted SBP and DBP reactivity to the PASAT, and less time spent persevering at the CP task related to blunted SBP, DBP and HR reactivity to the PASAT (all $p \leq .05$). Following adjustment for potential confounders (gender, ethnicity, PASAT performance, ratings of task) all associations remained significant.

Conclusion: These findings add to the evidence which implicates blunted reactivity as a marker for poor behavioural regulation, and specifically for low perseverance. This suggests that acute stress reactivity may tap into otherwise unconscious motivational processes and might be used to identify those most in need of support in settings requiring high perseverance such as rehabilitation or lifestyle interventions.

Abstract 1489

DO TRAIT INDICATORS OF WELL-BEING ASSOCIATE WITH PHYSIOLOGICAL REACTIVITY AND RECOVERY TO ACUTE LABORATORY STRESSORS IN HEALTHY ADULTS? A SYSTEMATIC REVIEW AND META-ANALYSIS

Caitlin M. DuPont, MS, Trevor M. Weis, HSDG, Stephen B. Manuck, PhD, Anna L. Marsland, PhD, Karen A. Matthews, PhD, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA Historically, there has been an emphasis on studying the link between negative psychosocial traits and greater risk for disease; however, more recent research is shifting to a focus on positive psychological factors that may protect against disease risk. Various facets of well-being have been associated with reduced mortality, lower disease risk, and less subclinical cardiovascular disease. One postulate is that well-being may reduce cardiovascular disease risk by buffering against psychological stress and dampening stressor-evoked physiology. Here, we report a systematic review and meta-analysis of published studies investigating the effects of trait indicators of well-being on physiological reactivity and recovery to acute laboratory stressors. Well-being was subdivided into the categories of hedonic well-being (positive affect and vitality), eudaimonic well-being (mastery, autonomy, positive relatedness, life purpose, personal growth, and self-acceptance), and optimism. Laboratory stressors were categorized by task type, including cognitive (e.g., mental arithmetic), social (e.g., speech presentation), and emotional (e.g., sadness recall) stressors. Physiological variables were collected either during or after the stress task and were aggregated into cardiac (heart rate and cardiac output), hemodynamic (blood pressure), HPA (cortisol), and autonomic (high frequency heart rate variability, skin conductance, and catecholamines) markers. Medline, PsychINFO, and PubMed were used to identify relevant articles. The search yielded 27 studies ($n = 3,390$; 54.6% women). Estimates of effect sizes and confidence intervals were calculated using a random-effects model with pooled variance. Surprisingly, optimism was associated with *greater* cardiac reactivity to cognitive stressors ($r = 0.07$, $CI_{95\%} = 0.01$ to 0.12 ; $p = 0.01$), and showed no associations with physiological recovery ($r = 0.01$, $CI_{95\%} = -0.02$ to 0.04 , $p = 0.48$). By contrast, hedonic well-being was associated with *faster* hemodynamic recovery from stressors ($r = -0.13$; $CI_{95\%} = -0.24$ to -0.01 , $p = 0.04$), but showed no association with physiological reactivity ($r = 0.01$, $CI_{95\%} = -0.03$ to 0.05 , $p = 0.67$). The results suggest that hedonic well-being, but not optimism, may buffer against the physiological consequences of psychological stress via recovery processes.

Supported by NIH Grant T32HL07560

Abstract 1344

A TEST OF THE INDEPENDENT AND INTERACTIVE EFFECTS OF DOMAIN-SPECIFIC AWARENESS AND ACCEPTANCE MANIPULATIONS ON CARDIOVASCULAR RESPONSES TO ACUTE STRESS

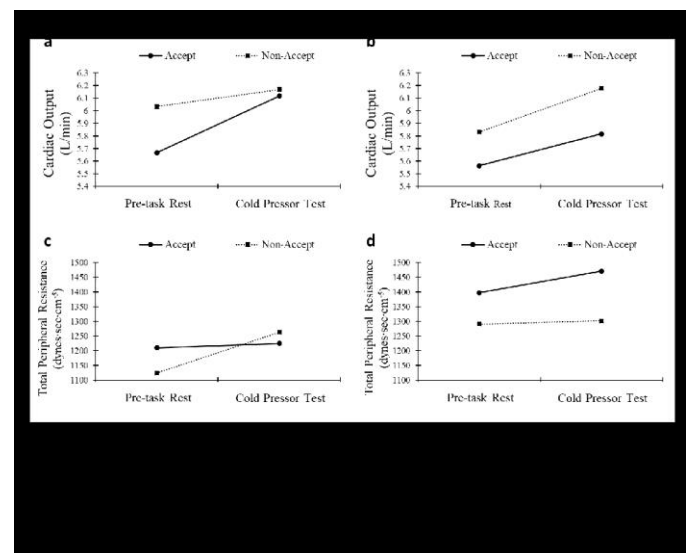
Andrew W. Manigault, MS., Brett J. Peters, PhD., Peggy M. Zoccola, PhD., Psychology, Ohio University, Athens, OH

Mindfulness includes acceptance and awareness subcomponents, and recent theories imply that cultivating both acceptance and awareness may benefit health by diminishing stress reactivity. Yet, no prior work has manipulated awareness and acceptance simultaneously to begin to test this claim.

Participants (202 healthy undergraduate students, aged 18-25, 64% female) were assigned to be accepting/non-accepting and aware/non-aware of their physiological responses to a social-evaluative cold pressor test in a 2 x 2 between-subjects experimental design. Acceptance was manipulated by presenting the Chinese finger trap analogy (to promote acceptance of one's physiological responses) or neutral information about typical stress responses whereas awareness was manipulated by presenting hand temperature readings during the cold pressor test or no temperature readings. Cardiovascular indices (i.e., blood pressure, pre-ejection period, cardiac output and total peripheral resistance) were recorded throughout the study.

Awareness and acceptance did not independently influence cardiovascular responses. Instead, awareness and acceptance interacted to predict cardiac output ($F(4,726) = 5.58$, $p < .001$), and total peripheral resistance ($F(4,723) = 2.92$, $p = .020$) trajectories. Follow up contrasts revealed that the combination of awareness + non-acceptance led to higher total peripheral resistance, and lower cardiac output reactivity to the social-evaluative cold pressor test (indexing greater threat) than the awareness + acceptance and non-awareness + non-acceptance conditions (see Figure 1). Blood pressure and pre-ejection period reactivity was observed but these outcomes were unaffected by the acceptance and awareness manipulations.

These results add to a growing body of work suggesting that awareness and acceptance subcomponents of mindfulness interact to influence stress-related outcomes, such that the effects of acceptance are strongest under conditions of high awareness. The pattern of results also imply that the awareness + non-acceptance condition may have led to relatively more threat than challenge states during the cold pressor test than the awareness + acceptance (and the non-awareness + non-acceptance) condition, in line with the biopsychosocial model of challenge and threat. Implications for mindfulness theories are discussed.



PAPER SESSION:
NEUROCOGNITIVE FUNCTIONING, INTEROCEPTION, AND FUNCTIONAL CORRELATES
Saturday, March 14 from 2:00 to 3:00 pm

Abstract 1712

NEUROCOGNITIVE FUNCTIONING IN PATIENTS WITH FUNCTIONAL NEUROLOGICAL SYMPTOM DISORDER

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Background: Neurocognitive symptoms are common in individuals with somatic symptom and related disorders (SSRD) and depression, but little is known about the specific impairments in neurocognitive domains in patients with functional neurological symptom disorder (FNSD; also referred to as conversion disorder).

Methods: The sample consisted of 318 patients. 29 patients were diagnosed with FNSD (mean age 42.4, *Standard Deviation (SD)* = 13.8 years, 79.3% women), and 289 patients had other SSRD (mean age 42.1, *SD* = 13.3, 60.2% women). Patients completed a neuropsychological test battery that evaluated performance in a broad range of neurocognitive domains, including information processing speed, attention and executive functioning.

Results: Based on normative data comparison, deficits and disorders in patients with FNSD were observed in all neurocognitive domains. Patients with FNSD performed significantly worse on information processing speed (WAIS Digit Symbol Substitution Test; $V = .115, p = .035$); Stroop Color Word Test card 1: $V = .190, p = .006$; and Stroop Color Word Test card 2: $V = .244, p < .001$) than patients with other SSRD. No differences in FNSD vs. other SSRD were observed in the neurocognitive domains of attention and executive functioning.

Conclusion: Patients with FNSD perform worse on information processing speed tests compared to patients with other SSRD, whereas attention and executive functioning do not substantially differ between FNSD versus other SSRD. These findings have potential implications for the neurobiological underpinnings of FNSD and also may be relevant to therapeutic approaches in FNSD from a neurocognitive rehabilitation perspective.

Abstract 1805

CAN YOU FEEL THE BEAT? NEURAL AND BEHAVIORAL CORRELATES OF INTEROCEPTION IN POST-MENOPAUSAL WOMEN LIVING WITH HIV

Roger McIntosh, Ph.D., Jennifer Britton, Ph.D., Psychology, University of Miami, Coral Gables, FL

Symptoms of alexithymia (AL) are elevated in many chronic disease populations such as persons living with the Human Immunodeficiency Virus (HIV). Difficulties identifying and describing feelings are associated with poorer psychosocial adjustment and disease management in these individuals. AL symptoms are thought to have a neurological underpinning that involves a central breakdown in interoceptive processing. Moreover, the “salience network” of brain regions commonly implicated in interoception, i.e., anterior insula and cingulate, show volumetric reductions as a function of HIV-viral DNA. In this study, a group of ethnically-diverse HIV+ postmenopausal women ($n=15$, mean age = 55.86, *SD* = 4.55) were compared to HIV-negative controls ($n=25$, mean age = 55.56, *SD* = 7.21) during an interoception task adopted for fMRI where attention to heartbeat was compared to trials where attention was allocated towards or away from auditory tones (Zaki et al., 2012). The aim of the current study was to examine the neural and behavioral correlates of

interoceptive awareness as it relates to AL and other somatic symptoms associated with chronic illness. Structural and functional neuroimages were acquired using a GE® MR750 3.0 Tesla gradient-echo magnetic resonance scanner with a 32-channel head coil. A comparison of gray matter volume revealed HIV-related deficits in left and right anterior insula (p 's $< .05$), but not anterior cingulate ($p > .05$). Blood oxygen level dependent (BOLD) activity during the heartbeat detection task (when distracting tones were ignored) elicited the greatest activity within salience network structures. A comparison of BOLD activity during this task revealed significant HIV-related deficits in the right anterior insula and left dorsal-medial prefrontal cortex (FWE-corrected, $p < .001$). Within the entire cohort greater task-related activity within the left and right anterior insula correlated with less difficulty describing feelings indexed by the Toronto Alexithymia Scale. Among HIV+ women, greater BOLD activity in the left and right insula during the heartbeat detection task correlated with lower total AL and difficulty describing feelings as well as less fatigue and self-reported pain. Behavioral indices of heartbeat detection, i.e., hit rate, did not differ between groups and was not associated with levels of AL or somatic symptoms ($p > .05$).

Abstract 1468

IMPACT OF INTEROCEPTIVE TRAINING ON ANXIETY IN AUTISTIC ADULTS: THE 'ALIGNING DIMENSIONS OF INTEROCEPTIVE EXPERIENCE' (ADIE) TRIAL

Lisa Quadt, PhD, James Mulcahy, MSc, Hugo D. Critchley, PhD, Sarah N. Garfinkel, PhD, Neuroscience, Brighton and Sussex Medical School, Brighton, NA, United Kingdom

Background

Up to 60% of autistic adults suffer from an anxiety disorder, making the development of effective targeted treatments a much needed endeavour. Anxiety has previously been linked to impairments in interoception, the central communication and sensory perception of visceral signals, such as heartbeats. Individuals differ with respect to the degree to which they can accurately detect their own heartbeats, i.e., interoceptive accuracy. We demonstrated that autistic individuals express deficits in tests of interoceptive accuracy, but display heightened subjective beliefs about how sensitive they are to bodily signals. This discrepancy (interoceptive trait prediction error) explained variance in anxiety and is thus the target of this trial testing a new therapy against anxiety based on improvement of interoceptive accuracy (ADIE). The results of the trial will be un-blinded and analysed in January 2020.

Methods

This study is a double blind randomised controlled trial comparing ADIE therapy to an active control therapy (prosody recognition training). Each group has 60 autistic, verbal adults between the ages of 18-65. Participants will undergo baseline (T0) testing of interoceptive abilities and affective symptomatology, and will be retested at T1 to assess the impact of body-awareness training on potential reductions in anxiety, and indices of improved psychosocial functioning. A therapist-guided training program will focus on interoception with immediate feedback and guidance. We will compare the effectiveness of ADIE therapy to a similar training protocol targeting autism-relevant exteroceptive processing.

Hypotheses

Hypothesis 1: Reduced anxiety and psychosocial difficulties will be observed at T1 in the ADIE group as an effect of improved interoceptive accuracy.

Hypothesis 2: Reduced interoceptive trait prediction error will relate directly to decreases in anxiety and psychosocial difficulties at T1.

Outlook

This is the world-wide first randomized controlled trial using interoceptive training to target anxiety in autistic adults. The implications of its results are of high clinical and scientific importance, potentially indicating strong evidence for a role of interoception in the aetiology and maintenance of anxious affect, and offering an effective

novel treatment method to the high numbers of autistic adults suffering from anxiety.

Abstract 1644

MINDFULNESS-BASED COLLEGE: A STAGE 1 RANDOMIZED CONTROLLED TRIAL FOR EMERGING ADULT WELL-BEING

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BACKGROUND: During emerging adulthood (age 18-29 y), risk taking and exploration are high, psychiatric illnesses peak, loneliness is elevated, and high levels of adverse health behaviors manifest. Mindfulness-based programs have capacity to foster well-being during this life course stage.

PURPOSE: To develop a mindfulness-based program adapted to the emerging adult life course stage, named Mindfulness-Based College (MB-College), and evaluate its acceptability, feasibility, and effects on health.

METHODS: This was a Stage 1 randomized controlled trial of MB-College vs. enhanced usual care, with three months follow-up time (n=96). Focus groups evaluated acceptability and feasibility. The primary quantitative outcome registered on ClinicalTrials.gov was an emerging adult health summary score composed of key health risk factors in emerging adulthood: body mass index, physical activity, fruit and vegetable intake, alcohol consumption, stress, loneliness, and sleep duration.

RESULTS: Of the 47 participants randomly assigned to MB-College, 8 (17%) dropped out while the course was taking place. Follow-up rates including both groups (n=96) were 86% at 3 months. Qualitative results indicated that, overall, participants found the program acceptable and feasible. Significant improvements were demonstrated in the health summary score (marginal effect for MB-College vs. control=0.23; p=0.004). Effects on loneliness were pronounced (marginal effect=-3.11 for R-UCLA score; p=0.03). Secondary analyses showed significant impacts of MB-College on other well-being indicators (e.g. depressive symptoms, p=0.03; sleep quality, p=0.04) and mechanisms.

CONCLUSIONS: Findings of this early stage clinical trial suggest that, if replicated with longer term follow-up, MB-College may foster health in emerging adults.

PAPER SESSION:

PATIENT-PROVIDER EFFECTS

Thursday, March 12 from 11:45 am to 12:45 pm

Abstract 1678

BELIEFS ABOUT PATIENT'S EMOTIONS ATTENUATE THE DIAGNOSIS OF CORONARY ARTERY DISEASE

Matthew J. Zawadzki, Ph.D., Psychological Sciences, University of California, Merced, Merced, CA, Stephanie A. Shields, Ph.D., Psychology, The Pennsylvania State University, University Park, PA, Paul M. Haidet, M.D., Office of Medical Education and the Departments of Medicine and Humanities, The Pennsylvania State University College of Medicine, Hershey, PA

Background: Coronary artery disease (CAD) is the most frequent cause of death for men and women in the United States. Despite its prevalence, diagnosing CAD can be difficult as angina, the most frequent presenting symptom, is relatively nonspecific and is also commonly present in emotion disorders. **Objective:** This study examined whether physicians' beliefs regarding patients' emotion

influence perceptions of patients' angina, predicting that CAD would be seen as less likely when more emotion is perceived as present. **Method:** Participants watched a video of a standardized patient discussing chest pain while exhibiting a typical presentation of CAD. The sample consisted of 90 third and fourth year medical students and residents in internal medicine or primary care, consisting of 55 women and 35 men who self-identified primarily as Caucasian and Asian/Asian-American. Participants reported the likelihood of CAD and emotion-based diagnoses and the extent to which they would recommend testing that would contribute to a CAD diagnosis. They then recalled symptoms from the case and indicated the extent to which each symptom had a psychosomatic origin. Finally, participants reported the extent to which the patient's perceived emotion was used in forming a diagnosis. **Results:** CAD was less likely to be offered as a diagnosis when the likelihood of an emotional disorder was rated higher ($p < .001$), patient's symptoms were attributed to psychosomatic causes ($p < .001$), and the patient's emotions were used to establish a diagnosis ($p < .001$). In addition, further diagnostic testing was less likely to be recommended when physicians were more likely to attribute symptoms to psychosomatic causes or to use patient's emotion to make a diagnosis ($ps < .05$). **Conclusions:** These results provide further evidence that beliefs regarding patients can influence diagnoses, and that beliefs about patients' emotions in particular may be an important influence on how patients are treated. Results have implications for why women may be under-diagnosed for CAD as female patients tend to be rated more emotional than male patients.

Abstract 1780

DIFFERING PERCEPTIONS OF HEALTHCARE SERVICES BETWEEN MEDICAL PROVIDERS AND TRANSGENDER WOMEN IN MIAMI-DADE COUNTY, FLORIDA

Andrew J. Wawrzyniak, Ph.D., Psychiatry and Behavioral Sciences, Allan E. Rodríguez, M.D., Valeria Botero, M.A., Division of Infectious Diseases, Department of Medicine, University of Miami Miller School of Medicine, Miami, FL, Monika Cintulova, BSN, Joseph De Santis, Ph.D., School of Nursing and Health Studies, University of Miami, Coral Gables, FL

Background: Transgender women are disproportionately burdened by HIV infection and are 49 times more likely to acquire HIV compared to other groups. In Miami-Dade County, Florida, compared to county-wide averages, transgender women are more likely to test positive (6.34% vs. 1.50%) and less likely to be successfully linked to HIV care (61% vs. 85%). Nationally, 26% of transgender women reported medical provider discrimination, suggesting that healthcare providers themselves may fuel this health disparity. To better understand how healthcare-related factors may contribute to this disparity, the present study compared knowledge, attitudes, and practices regarding HIV prevention and treatment between HIV care providers and transgender women.

Methods: Local medical providers offering HIV care and transgender women answered similar questions about psychosocial factors, perceptions of transgender women, and beliefs about transgender-specific healthcare services. Responses were then compared between medical providers and transgender women.

Results: Perceptions of healthcare differed between medical providers (n=55) and transgender women (n=70). Transgender women's self-reported self esteem and social support were significantly higher than healthcare providers' estimations; actual perceived stress was significantly lower than providers' estimates ($p < 0.0001$ for all comparisons). Socioeconomic factors indicated that transgender women were still at a high risk for HIV acquisition: 36.4% were uninsured and 40.9% earned income through sex work. Providers inaccurately estimated transgender-specific health factors. Only 44.4% of providers thought that transgender women were tested for HIV; all transgender women (100%) reported having been tested. Additionally, 26.4% of providers said that patients have educated them about transgender healthcare needs. Nevertheless, transgender

women had significantly higher ratings of the quality, sensitivity, and competency of transgender-specific healthcare services than did medical providers ($p < 0.005$ for all comparisons).

Conclusions: Perceptions of healthcare services differ greatly between medical providers and transgender women. This study identified multiple healthcare-related factors specific to this patient population that could be improved in order to diminish the increased burden of HIV infection experienced by transgender women.

Abstract 1586

INFLUENCE OF PATIENT IMMIGRANT STATUS ON PROVIDER DIABETES TREATMENT DECISIONS: A VIRTUAL PATIENT EXPERIMENTAL STUDY

Loretta Hsueh, MA, Adam T. Hirsh, PhD, Clinical Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN, Mary de Groot, PhD, Medicine, Kieren J. Mather, MD, Internal Medicine, Indiana University School of Medicine, Indianapolis, IN, Jesse C. Stewart, PhD, Clinical Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN

Immigrants are at elevated risk for not having their diabetes treatment appropriately intensified, likely resulting in poorly-controlled diabetes and increased morbidity and mortality. Immigrant status is a powerful sociodemographic cue, yet its influence on providers' diabetes treatment decisions is unknown. **Objective:** To determine the effect of patient immigrant status on providers' decisions to (1) take no action, (2) add an oral hypoglycemic agent (OHA), (3) add/switch to insulin, or (4) refer the patient to an endocrinologist. **Method:** Participants were 140 medical students/professionals currently engaged in formal training (clerkship through fellowship; 'providers'). Providers viewed profiles (videos + vignettes) for 8 virtual patients differing in immigrant status (born in Mexico or U.S.; other characteristics held constant). Provider treatment decisions were measured continuously and dichotomously. Following a lens model design, analyses were completed at the group ('nomothetic') and individual ('idiographic') levels. Effect sizes (Cohen's d) ≥ 0.50 for the influence of immigrant status on treatment decisions were considered to indicate meaningful differences in treatment decisions across immigrant status. **Results:** Nomothetic results indicated providers were less likely to refer foreign-born patients to endocrinology than U.S.-born patients ($p = 0.03$; Table 1). No differences were detected for the other 3 treatment likelihood ratings. Idiographic results indicated that about half of provider decisions were influenced by patient immigrant status (i.e., $d \geq 0.50$) across all 4 treatment decisions (Table 2). Effect size data show an almost even split between higher treatment ratings for foreign-born vs. U.S.-born patients for 3 decisions (take no action, add an OHA, add/switch to insulin), explaining why group-level differences for these ratings did not emerge (i.e., they were cancelled out). **Conclusion:** Providers are less likely to refer foreign-born patients to endocrinology, potentially leading to clinical inertia. Half of individual-level provider decisions were meaningfully influenced by patient immigrant status. However, traditional group-level analyses mask these important individual-level differences. These systematic differences in treatment based on non-relevant factors could lead to unintended adverse outcomes for the foreign-born population.

Table 1. Results of Nomothetic (Group-Level) Analyses Comparing Provider Diabetes Treatment Decisions for Mexico-Born and U.S.-Born Virtual Patients (VPs)

	Mexico-Born VPs	U.S.-Born VPs	
Continuous Decisions (0-100 VAS)	Mean (SD)	Mean (SD)	<i>p</i> -value
Take No Action	25.5 (22.4)	23.7 (21.1)	0.10
Add an OHA	53.9 (23.2)	54.4 (24.0)	0.62
Add/Switch to Insulin	59.8 (22.2)	60.0 (22.8)	0.75
Refer to Endocrinologist	20.0 (27.9)	32.1 (28.5)	0.03
Dichotomous Decisions (Yes/No)	Frequency Yes, % ^a		
Take No Action	72 (12.8%)	70 (12.5%)	0.86
Add an OHA	296 (52.9%)	284 (50.7%)	0.47
Add/Switch to Insulin	338 (60.4%)	338 (60.4%)	1.00
Refer to Endocrinologist	168 (30.0%)	197 (35.2%)	0.06

VAS, visual analog scale; OHA, oral hypoglycemic agent.

^aPercentage of 560 observations from within each level of immigrant status, Mexico-born vs. U.S.-born (4 decisions x 140 providers).

Table 2. Results of Idiographic (Individual-Level) Analyses Characterized by Frequency and Direction of Effect Sizes for the Influence of Virtual Patient (VP) Immigrant Status on Continuous Provider Diabetes Treatment Decisions

Treatment Decisions	Effect Size Range	Higher to Mexico-Born VPs	Higher to U.S.-Born VPs
	<i>d</i>	%	%
Take No Action	0.50-0.79	10.0	12.1
	0.80+	14.3	7.9
Add an OHA	0.50-0.79	9.3	13.6
	0.80+	14.3	12.9
Add/Switch to Insulin	0.50-0.79	10.0	11.4
	0.80+	17.9	12.1
Refer to Endocrinologist	0.50-0.79	11.4	12.1
	0.80+	7.1	16.4

d=0.50-0.79 indicates a medium-to-large effect size; *d*=0.80+ indicates a large effect size. OHA, oral hypoglycemic agent.

Abstract 1401

DOES HEALTH ANXIETY IDENTIFY PRIMARY CARE PATIENTS WITH A HIGH LIKELIHOOD OF EXPERIENCING HEALTH CONSEQUENCES OF CHILDHOOD ADVERSITY? A PROOF OF CONCEPT

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Adverse childhood experiences (ACEs) are associated with physical illnesses and symptoms, health anxiety, distress, and impaired function, yet primary care patients are often not asked about ACEs. Family doctors who don't routinely screen for ACEs might initiate the discussion with the subset of patients whom are most likely to have experienced health consequences of ACEs. We tested the concept that health anxiety could identify this higher-risk group. **Method:** 233 primary care patients were surveyed about perceived health, ACEs, physical symptoms (PHQ15), health anxiety (HAI), psychological

distress (K10) and function (WHODAS). In 117 selected randomly, we identified a proxy for health anxiety: any 1 of 3 HAI items (I am often unable to resist thoughts of illness, I usually feel at least moderate risk of developing a serious illness, my family or friends would say I worry too much about my health: yes/no). In the remaining 116 (validation cohort), we tested the sensitivity (SENS) and negative predictive value (NPV) of this marker with respect to health consequences of ACEs: low threshold = ACE score ≥ 3 AND at least one of high PHQ15, high K10 (using valid cut-offs), or perceived health < very good; high threshold = ACE ≥ 3 AND at least two of these outcomes. Correlations between ACE score and impaired function were compared in participants with or without health anxiety. **Results:** Exposure to 10 types of ACEs was: zero-31%, one-28%, two-16%, three-10%, and four or more-15%. 32% of patients in the validation cohort had health anxiety by this criterion. Health consequences of ACEs were present in 18% (low threshold) or 13% (high threshold). Health anxiety identified patients with health consequences of ACEs with 67% SENS and 91% NPV (low threshold) or 87% SENS and 98% NPV (high threshold). Overall, the correlation between ACE score and impaired function was .45 ($n=77$) in those with health anxiety and .21 ($n=156$) in those without health anxiety (difference: $z = 1.9$, $p = .03$). **Discussion** Identifying health anxiety in primary care may allow targeted ACE screening in the third of patients that includes most of those with health consequences of ACEs (67-89% of these patients). This approach would save time and avoid asking about ACEs in those with either low exposure or few health consequences. Replication of this finding is both required and justified.

PAPER SESSION:

PRENATAL STRESS AND BIOMARKERS

Thursday, March 12 from 4:15 to 5:30 pm

Abstract 1472

PRENATAL MATERNAL DISTRESS AND INFLAMMATORY MARKER TRAJECTORIES FROM MID-PREGNANCY TO A YEAR AFTER BIRTH

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Background: Antenatal distress is associated with adverse pregnancy and postpartum outcomes, possibly through inflammatory pathways. Few studies have assessed whether depressive symptoms, general anxiety, or pregnancy-specific anxiety predict inflammation during pregnancy and postpartum. The purpose of these analyses is to determine whether prenatal maternal distress is associated with inflammatory markers at mid-pregnancy and their trajectories from mid-pregnancy to one-year after birth.

Methods: The sample consisted of 187 women from the Healthy Babies Before Birth (HB3) study, recruited from Los Angeles and Denver. Women completed measures of depressive symptoms (PHQ-9), general anxiety (OASIS), and pregnancy-specific anxiety at study entry (8-16 weeks gestation). Blood samples were collected during pregnancy (8-16, 20-26, and 30-36 weeks gestation), and after birth (1, 6 and 12 months). Five inflammatory markers (IL6, IL10, IFN γ , IL8, TNF α) were assayed from plasma via electrochemiluminescence on a MesoScale Discovery multiplex platform. Covariates are maternal sociodemographics, parity, pre-pregnancy body mass index, self-reported infections during pregnancy, and child sex. Multilevel

modelling was used to test associations between maternal distress variables and levels of each inflammatory marker at study entry and inflammatory marker trajectories over the follow-up.

Results: Higher pregnancy-specific anxiety was associated with lower anti-inflammatory IL10 at study entry, $b = -.005$, $SE = .007$, $p = .001$. Pregnancy-specific anxiety was also associated with quadratic change in IL10 from mid-pregnancy to a year postpartum, $b = .017$, $SE = .007$, $p = .026$, such that higher pregnancy-specific anxiety predicted greater amplitude of change in IL10 from pregnancy to the postpartum period. Neither depressive symptoms nor general anxiety were associated with IL10 at baseline or over the follow-up, p 's $> .094$. None of the distress variables were associated with any other inflammatory markers either at baseline or over the follow-up, p 's $> .059$.

Conclusions. Higher pregnancy-specific anxiety was associated with lower IL10 at mid-pregnancy, and greater fluctuations in IL10 from mid-pregnancy to a year postpartum. Pregnancy-specific anxiety may be involved in anti-inflammatory regulation of the pregnant and immune system through one year after birth.

Abstract 1484

MATERNAL PRENATAL HYPOTHALAMIC-PITUITARY-ADRENAL AXIS FUNCTION PREDICTS UNIQUE POSTPARTUM DEPRESSIVE SYMPTOM PROFILES

Jessica L. Irwin, PhD, Department of Psychology, Chapman University, Orange, CA, Curt A. Sandman, Ph.D., Department of Psychiatry and Human Behavior, University of California, Irvine, Irvine, CA, Elysia P. Davis, Ph.D., Department of Psychology, University of Denver, Denver, CO, Laura M. Glynn, Ph.D., Department of Psychology, Chapman University, Orange, CA

Background:

Despite the high incidence and damaging repercussions of postpartum depression (PPD), it is not known whether PPD is distinct from major depressive disorder (MDD) occurring outside the perinatal period. One approach to investigating the distinctions between PPD and MDD is to determine whether PPD has psychobiological mechanisms of risk that are unique from those of MDD. HPA-axis function has been widely hypothesized to play a role in MDD and in PPD. However, the majority of studies examining this mechanistic pathway in pregnancy have focused exclusively on cortisol. It has been proposed that concurrent consideration of both cortisol and dehydroepiandrosterone (DHEA) may be a more informative index of maternal HPA-axis activity. Thus, the current study sought to identify whether concentrations of DHEA and cortisol, and their ratio are associated with overall, atypical, and melancholic depressive symptomatology.

Method:

Data are from the Pregnancy Experiences and Infant Development Study, a prospective longitudinal study of women followed beginning in the first trimester of pregnancy ($N=101$). Concentrations of cortisol and DHEA, and their ratio, were quantified from maternal hair (3 cm) collected at 15 weeks' gestation with liquid chromatography tandem mass spectrometry. At 2-months postpartum, depressive symptoms were assessed with the 30-item Inventory of Depressive Symptomatology, which yields an overall total score and two subscale scores for atypical and melancholic depressive symptoms. Analyses were conducted using linear regression.

Results:

Higher DHEA was associated with elevated levels of atypical depressive symptomatology ($\beta = .278$, $p = .007$), but not overall or melancholic symptom profiles. This association held after consideration of relevant covariates including age, socioeconomic status, obstetric course and prenatal depressive symptoms. Neither cortisol nor the cortisol/DHEA ratio was associated with overall or subtypes of depressive symptomatology.

Conclusions:

These findings suggest that DHEA may represent a biomarker of maternal atypical PPD symptoms. More broadly, these findings underscore the importance of considering the joint contributions of prenatal cortisol and DHEA when considering HPA-axis pathways in

risk for perinatal psychopathology and the importance of considering unique symptom profiles to further understanding of PPD.

Abstract 1783

PERINATAL DEPRESSIVE AND ANXIETY DISORDERS AND PRENATAL AND POSTPARTUM CYTOKINE CHANGES

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Background: Maternal mood and pregnancy-specific affective states predict birth outcomes and postpartum health, but few studies have investigated the physiological mechanisms. The current study examined whether women with perinatal mood disorders would exhibit differential pro- and anti-inflammatory markers during the prenatal and postpartum periods compared to women without these disorders.

Methods: The sample included 183 pregnant women in Healthy Babies Before Birth (HB3), a longitudinal study of 231 women in Denver and Los Angeles. The study involved 3 prenatal visits (1 per trimester) and 3 visits after birth at 1, 6, and 12 months. The Structured Clinical Interview for the DSM-IV (SCID) was given to participants who scored above cutoffs on screeners for anxiety (PHQ-9) and depression (OASIS) at study outset (23%). Of the 183 women, 27 received a diagnosis of Major Depressive Disorder (MDD) or Generalized Anxiety Disorder (GAD) and were compared to the other participants.

Blood samples were collected at each study visit. Plasma pro-inflammatory marker IL-6 and anti-inflammatory marker IL-10 were assayed via electrochemiluminescence on a MesoScale Discovery multiplex platform. Covariates were maternal age, marital status, education, income, parity, pre-pregnancy body mass index, infections during pregnancy, and infant sex. Multilevel modeling compared levels of cytokines between participants with and without SCID diagnoses and examined within-person IL-6 and IL-10 trajectories over time.

Results: Early pregnancy SCID diagnoses were associated with quadratic change in IL-6 from the prenatal to postpartum period ($b = .008$, $SE = .004$; $p = .043$). Participants with SCID diagnoses had greater increases in IL-6 from study entry to 6 months postpartum and exhibited lower IL-10 at mid-pregnancy ($b = -.073$, $SE = .030$; $p = .016$). No differences in IL-10 trajectories by SCID diagnosis over the follow-up were detected (p 's $> .201$).

Conclusions: Pregnant women with mood disorders had higher levels of circulating IL-6 at all study timepoints and lower levels of IL-10 in mid-pregnancy. Women with mood disorders may have a heightened proinflammatory state during pregnancy and after birth, but without a reciprocal anti-inflammatory response. This finding adds to knowledge on perinatal mood disorders and has implications for pathways to preterm birth and infant outcomes.

Abstract 1417

PRENATAL TRAUMATIC STRESS AND OFFSPRING HAIR CORTISOL CONCENTRATION: A NINE YEAR FOLLOW UP TO THE RED RIVER FLOOD PREGNANCY STUDY

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Roemmich, Ph.D., USDA-ARS-Plains Area, Grand Forks Human Nutrition Research Center, Grand Forks, ND, Clayton J. Hilmert, Ph.D., Psychology, North Dakota State University, Fargo, ND

Findings concerning the relationship between maternal prenatal and child cortisol concentrations is inconsistent, implicating unaccounted for moderators of this association. This study examined whether the influence of an objective traumatic stressor during pregnancy, distance from a natural flood disaster, moderated the association between prenatal maternal diurnal cortisol area under the curve (AUC) and 9-year-old offspring hair cortisol concentrations. Data were collected from 56 of the mothers who took part in a study of flood-related pregnancy outcomes in 2009 and their children. Data included distance of the maternal home from flooding areas, four maternal saliva cortisol assessments (waking, 30 minutes after waking, afternoon, and before bed) provided within 3 months of the flood crest and used to calculate diurnal AUC, and child hair samples to assess cortisol secretion over the past month. A hierarchical regression analysis was run to predict child cortisol including maternal age, child sex, SES, gestational age at maternal cortisol sampling and current stress in step 1, followed by distance from flooding and maternal cortisol AUC as continuous variables in step 2, and then the interaction of these variables in step 3. There was a significant interaction between proximity to flooding during pregnancy and maternal cortisol AUC predicting child hair cortisol ($\beta=.428, p<.05$, Adj $R^2=.234$). At greater distance from flooding (i.e. lower stress conditions) there was non-statistically significant positive association between maternal cortisol and child cortisol ($\beta=.458$, $SE=.254, p=.14$). In contrast, living closer to flooding (i.e. higher stress conditions) produced a significant negative association between maternal and child cortisol ($\beta=-.369$, $SE=.120, p<.05$). Experiencing a traumatic stressor during pregnancy may alter maternal-fetal programming of the hypothalamic-pituitary-adrenal axis. The direct threat of flooding led to a maternal and offspring cortisol association that resembled associations seen in mothers with symptoms of Post-traumatic Stress Disorder and their offspring. This alteration is evident in 9-year-old offspring and may help explain inconsistencies in the previous literature.

Abstract 1618

STRESS MANAGEMENT INTERVENTION EFFECTS ON BIRTH OUTCOMES:

THE ROLE OF PRENATAL MATERNAL BIOMARKERS

Guido Urizar, PhD, Psychology, California State University, Long Beach, CA, Christine Dunkel Schetter, PhD, Psychology, University of California, Los Angeles, CA, Ilona S. Yim, PhD, Psychological Science, University of California, Irvine, CA

Elevated levels of prenatal stress have been associated with heightened risk for adverse birth outcomes, especially among low-income mothers and their infants. Yet, few studies have examined whether stress management interventions can be effective in improving birth outcomes in this population. The current randomized trial tested whether a prenatal cognitive-behavioral stress management (CBSM) intervention reduced birth complications in 100 low-income mothers and infants (75% had annual income <\$19K), and whether maternal biomarkers (cortisol, alpha amylase) moderated intervention effects on birth outcomes. During their first trimester of pregnancy, mothers were randomized to either an eight-week CBSM intervention or a control group. Women in the CBSM intervention ($n=55$) attended eight weekly group-based sessions in which a clinically-trained researcher taught relaxation and coping skills, whereas women in the control group ($n=45$) received eight weekly prenatal health pamphlets by mail. During their second trimester, cortisol and alpha amylase levels were measured in four saliva samples provided by mothers on one day (waking, 12pm, 4pm, and 8pm) to calculate AUC. Biomarkers were tested individually and as a ratio of cortisol over alpha amylase. After birth, a medical record review assessed the prevalence of nine birth outcomes (e.g., preterm birth, low birthweight, 1 min APGAR < 6, delivery type, labor duration) which were summed to create a birth complications index. Regression analyses revealed that women

randomized to the CBSM intervention experienced fewer birth complications compared to women in the control group, controlling for maternal age and parity [$t(5, 62)=-2.77, p=.008, R^2=.28$]. A significant interaction of randomization group by cortisol/alpha amylase ratio was found, such that infants of mothers in CBSM had fewer birth complications irrespective of their mothers' cortisol/alpha amylase ratio levels. Moreover, infants of mothers in the control group experienced more birth complications if their mother had elevated cortisol/alpha amylase ratio levels during pregnancy [$t(5, 62)=-2.33, p=.023, R^2=.28$]. These associations were not found for either cortisol or alpha amylase alone. These findings demonstrate promise of a prenatal CBSM intervention and shed light on mechanisms in reducing birth complications among low-income mothers and their infants.

PAPER SESSION:

PSYCHOLOGICAL MODERATION OF METABOLIC PATHWAYS

Saturday, March 14 from 2:00 to 3:00 pm

Abstract 1817

THE EFFECTS OF POSITIVE AFFECT AND EPISODIC FUTURE THINKING ON TEMPORAL DISCOUNTING, AND HEALTHY FOOD DEMAND AND CHOICE AMONG OVERWEIGHT AND OBESE INDIVIDUALS: A PILOT 2X2 FACTORIAL RANDOMIZED CONTROLLED STUDY

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Unhealthy dietary choices contribute to negative health outcomes, such as cancer and cardiometabolic diseases. To promote healthy eating, interventions should target both the regulation and reward mechanisms that guide eating behavior. Episodic future thinking (EFT)—imagining future personal experiences—may strengthen regulatory mechanisms by reducing temporal discounting (TD; i.e., valuing smaller immediate rewards over larger future rewards). Further, positive affect (PosA) related to healthy food may enhance the rewarding effects of healthy eating. Despite potential synergistic effects, these processes have not been examined together. We conducted a factorial, randomized, controlled pilot intervention to test the independent and interactive effects of EFT and PosA on TD, food choice, and food demand among overweight and obese adults. Using a 2 (EFT: yes, no) x 2 (PosA: yes, no) design, we randomized 153 participants with a BMI > 25 kg/m² (M age = 31 yrs; M BMI = 32; 70% female) to one of four guided imagery interventions. Participants completed surveys, a baseline TD task and a food demand task, followed by a brief guided imagery intervention, followed by a post-intervention TD task, food demand task, and behavioral food choice task. EFT conditions guided participants to think of a future where they have made healthy food choices. PosA conditions guided thoughts of positive feelings surrounding fruits and vegetables. A between-subject univariate ANOVA was conducted on all outcome indices. Results revealed a main effect of EFT condition on unhealthy food demand for both breakpoint (first price at which consumption was zero; $F(1,146)=5.45, p=.02$) and intensity (how much someone will consume at a price of \$0.01; $F(1,146)=4.66, p=.03$). We also found a main effect of EFT condition on healthy behavioral food choices

($F(1,152)=6.82, p=.01$). There were no significant effects of EFT or PosA on TD and no interactions were significant. These findings indicate that listening to EFT guided imagery focused on visualizing future healthful choices results in a devaluation of unhealthy food and an increase in healthy food preference in the lab. This suggests that EFT guided imagery can be targeted to address cognitive processes surrounding healthful behavior. Future research should explore scalability and dosing, and replicate findings with food decision-making outside the lab.

Abstract 1570

COPING MODERATES THE ASSOCIATIONS BETWEEN WEIGHT STIGMA AND PHYSICAL AND PSYCHOLOGICAL QUALITY OF LIFE

Alyssa K. Choi, B.A., Psychology, San Diego State University, San Diego, CA, Brooke C. Cullen, A.A., A. J. Tomiyama, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA

Background: Weight stigma is stressful, negatively impacting psychological and physical health. However, little research has examined strategies to help individuals who are targets of weight stigma combat its consequences. The well-established coping literature shows that approach-oriented coping has been linked to favorable health outcomes, whereas avoidance-oriented coping has been linked to poorer health outcomes. Given this, the current study tested coping as moderators of the associations between weight stigma and its known outcomes. The overarching goal of this pilot study was to provide proof of concept and choose measures for an upcoming longitudinal study of weight stigma and coping. We hypothesized that individuals who report higher approach-oriented coping and lower avoidance-oriented coping would evidence lower perceived stress, fewer depressive symptoms, and higher quality of life in relation to weight stigma. **Method:** In 214 participants (87.4% female; mean BMI = 23.95) reporting experiences with weight stigma, moderation models tested the interactions between anticipated, experienced, and internalized weight stigma, three measures of emotion regulation and coping (COPE, Brief CRI, ERQ), and four health outcomes (perceived stress, depressive symptoms, psychological quality of life, and physical quality of life), controlling for BMI and gender. Given the large number of tests, we interpreted results only when a significant moderator emerged for the same measure of weight stigma and at least two health outcomes. **Results:** Approach-oriented coping significantly moderated the associations between internalized weight stigma and physical and psychological quality of life [$?R^2s>.01, F_s(1, 208)>5.15, ps<.024$], and disengagement coping significantly moderated the associations between internalized weight stigma and depressive symptoms and physical quality of life [$?R^2s>.01, F_s(1, 208)>4.09, ps<.045$]. **Conclusion:** Approach-oriented and disengagement coping significantly moderated the associations between internalized weight stigma and mental and quality of life outcomes. If longitudinal and experimental studies support the present findings, intervening on coping strategies may promote better outcomes in individuals who are targets of weight stigma.

Abstract 1659

ASSESSING THE ROLES OF EXECUTIVE FUNCTIONING AND ANXIETY-ASSOCIATED INFLAMMATION IN PREDICTING BMI

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Obesity is associated with 13 types of cancer and chronic disease. Risk factors for obesity are numerous; among those associated with obesogenic behaviors are: anxious arousal, chronic low-grade inflammation, and executive functioning. How these risk factors interact with one another is still unclear. Pronounced anxious arousal (e.g., somatic symptoms of anxiety) is associated with negative mood,

impaired acute stress response and recovery, and has been linked to increased risk for poor physical and mental health. Disruptions in mood and cognition are also associated with elevated levels of pro-inflammatory biomarkers. Executive functioning impairment specifically has been associated with unhealthy behaviors related to inflammation and high body mass index (BMI). However, evidence is unclear whether poor executive functioning is a consequence of anxiety-associated inflammation that influences unhealthy lifestyle choices, or a risk factor for pronounced anxious arousal and related health behaviors that impact BMI. We aim to identify which models best predict BMI and its cognitive-affective mechanisms. Data from MIDUS (Midlife in the United States) Refresher phase (2011-2016) was analyzed. Participants were 711 adults, aged between 25 and 76 (mean age= 52.12), who completed telephone-administered surveys of psychosocial factors and executive functioning assessments and objectively collected biomarkers and anthropometric measures. The sample was 51.1% female, highly educated (85.5% beyond high school), and obese (mean BMI= 30.11 kg/m²). Serial mediation analyses supported a risk factor model where, after controlling for age, sex, and educational attainment, impaired executive functioning through greater anxious arousal and greater inflammation better predicted higher BMI. This was found for both interleukin-6 (IL-6) ($B= -.1120, CI\ 95\% [-.2065, -.0403]$) and C-reactive protein (CRP) ($B= -.0924, CI\ 95\% [-.1828, -.0272]$). There was no significant pathway to support the consequence model; however, executive functioning, IL-6, and CRP independently mediated the positive association between anxious arousal and BMI. These preliminary results suggest that both cognitive and affective processes related to anxious arousal are implicated in obesity, however executive functioning skills should be prioritized in examining determinants of obesity-related health behaviors.

Abstract 1555

ACUTE GLYCEMIC RESPONSE TO DIFFERENT STRATEGIES OF BREAKING UP SEDENTARY TIME

Meynard John L. Toledo, PhD, Department of Biobehavioral Health, Pennsylvania State University, University Park, PA, Barbara E. Ainsworth, PhD, Glenn A. Gaesser, PhD, College of Health Solutions, Arizona State University, Phoenix, AZ, Steven P. Hooker, PhD, College of Health and Human Services, San Diego State University, San Diego, CA, Mark A. Pereira, PhD, Division of Epidemiology and Community Health, University of Minnesota, Minneapolis, MN, Matthew P. Buman, PhD, College of Health Solutions, Arizona State University, Phoenix, AZ

Sedentary behavior significantly increases all-cause mortality, cardiovascular disease incidence and mortality, and type 2 diabetes incidence. However, intervention studies have mostly focused on the modality to break up sitting time (e.g., standing, walking at varying intensities), and less on how the frequency and duration of breaks can impact health outcomes. This study aimed to (i) determine the difference in glucose response between continuous sitting (CS) and two intermittent standing regimes (high frequency, low duration breaks [HFLD] and low frequency, high duration breaks [LFHD]) and (ii) to determine the difference in glucose response between the two strategies (HFLD vs. LFHD). Total sitting and standing time on both interrupted sitting conditions were equal, only differing in frequency and length of bouts. Ten sedentary employees (mean±SD age 46.8±10.6 years; 70% female) with impaired fasting glucose (mean glucose = 109.0±9.8 mg/dL) participated in a randomized cross-over trial. Participants performed three 7.5-hour laboratory visits (1 week apart) for each study condition (i.e., CS, HFLD and LFHD). Standardized breakfast and lunch (33% of daily caloric needs each; 50-60% carbohydrate, 25-30% fat, and 10-20% protein) were provided at each visit. Participants wore an activPAL device to measure compliance with the sit-stand condition and a continuous glucose monitor to measure post-prandial glucose response. Post-prandial mean glucose and incremental area under the curve were evaluated using linear mixed models. The results indicated that mean glucose of

the HFLD condition were significantly lower ($p < .01$) than the CS condition, mean difference of -7.70 (-11.98, -3.42) mg/dL/3.5h and -5.76 (-9.50, -2.03) mg/dL/7h for lunch and total time, respectively. The mean post-prandial glucose during lunch and total time were significantly lower in the HFLD condition compared to the LFHD condition, mean difference of -9.94 (-14.13, -5.74) mg/dL/3.5h and -6.23 (-9.93, -2.52) mg/dL/7h, respectively. No differences for any of the glucose measures were found between the CS and LFHD conditions. Overall, the results favor the use of short but frequent interruptions in sitting time to improve glycemic control of prediabetic individuals. Results can be used to inform the development of interventions that target the reduction of sitting time to improve overall health.

**PAPER SESSION:
SLEEP EPIDEMIOLOGY AND MODERATION OF HEALTH
PATHWAYS**

Friday, March 13 from 2:45 to 4:00 pm

Abstract 1702

INDIVIDUAL DIFFERENCES IN HABITUAL SHORT SLEEP DURATION: EXAMINATION OF SELF-RATED HEALTH VERSUS OBJECTIVE CARDIOVASCULAR DISEASE RISK IN NHANES

Paula G. Williams, Ph.D., Psychology, University of Utah, Salt Lake City, UT, Steven D. Barger, Ph.D., Psychology, Northern Arizona University, Flagstaff, AZ, Brian J. Curtis, M.S., Psychology, University of Utah, Salt Lake City, UT

The adverse health effects of short sleep duration are well established. In particular, habitual short sleep duration (i.e., 6 or fewer hours per night) is associated with increased risk of cardiovascular disease (CVD) and related mortality. There is heterogeneity among habitual short sleepers (HSS), however. Whereas most HSS report associated fatigue and behavioral impairment, a minority of HSS do not report any sleep-related daytime dysfunction. The overarching question is whether individuals without perceived dysfunction in response to short sleep incur the same level of health risk. Importantly, HSS with no reported dysfunction (HSS-NRD) evidence objective cognitive impairment and difficulty maintaining alertness at the same level as HSS who report dysfunction (HSS-RD), suggesting that their self-assessments may be inaccurate. The current study examined self-rated health (SRH), previously demonstrated to predict CVD risk, and objective CVD risk in HSS-RD ($N = 1527$) and HSS-NRD ($N = 259$). Participants were adults age 40-79 in the 2005-06 and 2007-08 cycles of the National Health and Nutrition Examination Surveys (NHANES). Assessments included the single item SRH (poor to excellent), self-reported average sleep duration, and self-reported daytime dysfunction (e.g., feeling unrested during the day). 10-year atherosclerotic CVD risk was calculated using a validated age, sex and race-specific algorithm. As predicted, HSS-NRD rated their overall health significantly better than HSS-RD, $b = -0.32$ (95% CI -0.51, -0.14), $p = 0.001$. However, the HSS-NRD group evidenced higher CVD risk (absolute risk 10.0%; 95% CI 8.8-11.2%) compared to their dysfunction-reporting counterparts (absolute risk 7.0%; 95% CI 6.6-7.4%), a clinically significant risk difference per treatment guidelines. To examine the correspondence between subjective health and objective risk, we examined the strength of association between SRH and CVD risk by HSS group. The SRH-CVD risk association was not significant for HSS-NRD ($b = -.008$ (95% CI -0.023, 0.0065) $p = 0.259$), but was significant for HSS-RD ($b = -.012$ [95% CI -0.016, -0.008] $p < 0.001$), a significant difference in coefficients, $F(2,30) = 17.53$, $p < 0.0001$. Findings suggest that the absence of perceived sleep-related dysfunction is associated with higher, not lower, CVD risk and with poorer subjective-objective health correspondence.

Abstract 1173

RELATIONSHIPS BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND SLEEP HEALTH IN YOUNG ADULTS: DOES VIGILANCE FOR THREAT PLAY A ROLE?

Karen P. Jakubowski, PhD, Karen A. Matthews, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Introduction: Adverse childhood experiences (ACEs) may be related to poor sleep. However, this literature is based upon single items of adversity, self-reported sleep, and limited study of mechanisms. Sleep health is a multi-dimensional construct that takes a 24-hour approach to the study of sleep. We examined the relationship between ACEs and sleep health and whether vigilance for threat mediates the relationship, because ACEs may lead individuals to be wary of threats, leading to poorer sleep, which inherently requires feelings of safety.

Methods: Undergraduates ($N=540$; 50% female; 71% white) aged 18-28 reported exposure to ten ACEs before age 18 and current sleep, mood, vigilance, and health. Sleep health was measured via 6-item RUSATED scale (Buysse, 2014), i.e. frequency of short, inefficient, and low quality sleep; later and more variable timing; poor daytime alertness. A subsample ($N=114$) provided 7-day actigraphy and daily diaries and laboratory-based behavioral and physiological measures of vigilance. Three sleep health scores were calculated: RUSATED survey score and actigraphy and diary scores using RUSATED cutoffs; range=0-12, higher=better sleep health. Vigilance was measured via survey and diary items (Social Vigilance Questionnaire; Ruiz, 2017); behavioral tasks (threat bias score via dot probe and ratings of hostile intent for characters in videotaped scenarios); and physiology (task levels of SBP, DBP, and pulse rate [PR] adjusted for baseline). Linear regressions and structural equation modeling (with bootstrapping for mediation) examined direct and indirect effects of ACEs on sleep health with appropriate covariates.

Results: On average, participants reported 1.1 ACEs ($SD=1.5$). Sleep health varied by type of measurement, with survey, actigraphy, and diary scores of 7.1 ($SD=2.5$), 5.5 ($SD=1.6$), and 7.1 ($SD=2.0$), respectively. ACEs were related to poorer survey sleep health ($p<.001$), but not to actigraphy or diary sleep health (Table 1). Results did not support mediation by any vigilance measure (Table 1). **Conclusion:** ACEs were related to survey, but not actigraphy or diary, sleep health. Results are consistent with past work suggesting retrospectively-measured adversity is more strongly related to self-report vs. objective health outcomes. Vigilance is an unlikely mediator for ACEs-sleep health relationships.

Funding: T32HL07560, T32MH018269

Table 1. Direct and indirect associations between ACEs and survey, actigraphy, and diary sleep health total scores

	Survey N=540	Actigraph N=112	Diary N=113
Direct Effects: ACEs → sleep health			
ACEs	-.44 (.19)*	-.26 (.26)	-.46 (.31)
Indirect Effects: ACEs → [vigilance] → sleep health			
<i>Self-Report Vigilance</i>			
Survey	.01 [-.08, .04]	.01 [-.06, .07]	.01 [-.05, .07]
Daily diary	-.02 [-.12, .08]	-.03 [-.11, .05]	-.04 [-.13, .05]
<i>Behavioral Vigilance</i>			
Threat bias score	.00 [-.03, .03]	.14 [-.41, .13]	.06 [-.06, .17]
Hostile intent rating	.07 [-.12, .25]	.02 [-.07, .11]	.05 [-.10, .21]
<i>Physiological Vigilance</i>			
SBP	-.01 [-.11, .08]	-.01 [-.05, .04]	-.01 [-.07, .06]
DBP	.03 [-.12, .18]	-.001 [-.05, .05]	.01 [-.07, .09]
PR	-.05 [-.18, .08]	-.01 [-.09, .07]	-.01 [-.11, .08]

Note. Values reflect unstandardized coefficient (standard error) for direct effects and unstandardized estimate [95% CI] for indirect effects. All analyses adjusted for age, sex, and race, with further adjustment for childhood SES, BMI, depressive symptoms, and alcohol and marijuana use in analyses testing direct effects. Higher scores=better sleep health.

* $p < .001$.

Abstract 1697

ADULT ATTACHMENT PREDICTS DAILY SLEEP VARIATION IN COLORECTAL CANCER PATIENTS

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Cancer diagnosis, a major stressor, activates the patients' internal working model of general interpersonal relationship (adult attachment), which may affect sleep. Less known is the extent to which attachment orientations are associated with daily variation of sleep, which this study investigated.

Newly and recently diagnosed colorectal cancer patients ($n=52$, $M=55.2$ years old, 38% female, 5 months post-diagnosis) self-reported attachment orientations (MAQ: security, avoidance, and anxiety). They also completed the Consensus Sleep Diary (subjective sleep measure) and wore a wrist Actigraph (objective sleep measure)

daily for 14 consecutive days, from which total sleep time (TST in hours), waking after sleep onset (WASO in minutes), and sleep efficiency (SE: 0–100%) were calculated.

Patients reported longer TST, shorter WASO, and better SE, compared to those derived objectively. Multilevel modeling separately predicted subjectively (s) and objectively (o) measured sleep indices. Attachment security was related to shorter overall sWASO ($B=-12.465$, $p=.028$). Also for those high on attachment security, longer oTST and longer oWASO on a given night was predicted by previous night's shorter oTST and shorter oWASO, respectively ($Bs \leq -.202$, $ps \leq .042$). On the other hand, attachment anxiety was related to shorter sTST and shorter oWASO ($Bs \leq -3.183$, $ps \leq .026$). Moreover for those high on attachment anxiety, longer sTST, longer sWASO, and longer oWASO ($Bs > .225$, $ps \leq .049$) were sustained across 14 nights. Finally, attachment avoidance only related to shorter overall sWASO ($B=-16.211$, $p=.013$).

Individual differences in relational characteristics predict distinct daily variations of sleep in cancer patients around the time of treatment initiation. Findings highlight that hypervigilance to interpersonal rejection and abandonment contributes to notably persistent patterns of daily sleep disturbance assessed both subjectively and objectively. The finding of interpersonal characteristics related to comfort with closeness and interdependence linking to inconsistent daily sleep patterns assessed objectively needs to be replicated with a larger sample. Findings warrant further investigation of interpersonal factors attributing to the differential indices of subjective versus objective sleep, and the long-term health outcomes in cancer patients.

Support: R01NR016838

Abstract 1248

SLEEP QUALITY MEDIATES AND TOBACCO ADDICTION MODERATES THE RELATIONSHIP BETWEEN EARLY LIFE ADVERSITIES AND DEPRESSION

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Despite the well-established relationship between early life adversities (ELA) and depression, the underlying mechanisms for this link remain less clear and need to be developed. The aim of this study was to advance our understanding of this link by testing the mediating role of sleep quality and the moderating role of tobacco use in this mediation. A total of 579 smokers and non-smokers were recruited in two communities in Minnesota and completed measures of stress, sleep, and tobacco use. Simple and moderated mediation analyses were performed using the PROCESS macro for SPSS, with the number of ELA as an independent variable, depression symptoms assessed by the Patient Health Questionnaire (PHQ-9) as a dependent variable, sleep quality assessed by the Pittsburgh Sleep Quality Index (PSQI) as a mediator, and smoking status as a moderator variable. Results of these analyses indicated that ELA and depressive symptoms were positively correlated, and sleep quality fully mediated this relationship. This mediation was moderated by tobacco use (index of moderated mediation = 0.10, $SE = 0.04$, 95% CI [0.03; 0.19]), indicating that the mediating effects of sleep problems was more pronounced among smokers ($b = 0.14$, $SE = 0.04$, 95% CI [0.07; 0.23]) than non-smokers ($b = 0.04$, $SE = 0.02$; 95% CI [0.0002; 0.10]). Subsequent mediation analyses run separately for each component of the PSQI suggested that individuals who experienced ELA and who were smokers had greater delays in sleep onset and were more likely to sleep for a shorter duration, both of which predicted greater depressive symptoms. These findings suggest that sleep quality and tobacco cessation are promising targets for preventive and therapeutic interventions. Our findings also call for further research into the role of ELA in depression.

Abstract 1631

ASSOCIATIONS OF INSOMNIA SYMPTOMS AND MARKERS OF MONOCYTE ACTIVATION, SYSTEMIC INFLAMMATION, AND COAGULATION IN HIV: DATA FROM THE VETERANS AGING COHORT STUDY

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Evidence suggests that insomnia may be a risk factor for cardiovascular disease in HIV (HIV-CVD); however, the mechanisms have yet to be elucidated. We examined cross-sectional associations of insomnia symptoms with biological mechanisms of HIV-CVD (immune activation, inflammation, and coagulation markers) among 1,542 people living with HIV enrolled in the Veterans Aging Cohort Study (VACS) Biomarker Cohort. Insomnia symptoms over the past four weeks were measured and dummy coded using responses to the item, “Difficulty falling or staying asleep?”, with the following response options: “I do not have this symptom” (reference) or “I have this symptom and...” “it doesn’t bother me,” “it bothers me a little,” “it bothers me,” “it bothers me a lot.” Monocyte activation marker soluble CD14 (sCD14), systemic inflammatory marker interleukin-6 (IL-6), and coagulation marker D-dimer were determined from banked blood specimens. Demographic-adjusted (age, sex, race/ethnicity) and fully-adjusted (prevalent CVD, hypertension, diabetes, BMI, smoking, total cholesterol, statin use, hepatitis C infection, renal function, anemia, alcohol use, cocaine use, viral load, CD4 count, ART) linear regression models were constructed, with log-transformed biomarker variables as the outcomes. We present the exponentiated regression coefficient (exp[b]) and its 95% confidence interval (CI) for each association. For sCD14 and D-dimer, we observed no significant associations (*p*>.09). For IL-6, we found that veterans in the “bothers a lot” group have 15% higher IL-6 than veterans in the “I do not have this symptom” reference group in the demographic model (exp[b]=1.15, 95% CI=1.02-1.29, *p*=.03). This association was attenuated and nonsignificant in the fully-adjusted model (exp[b]=1.07, 95% CI=0.95-1.19, *p*=.25). In sum, we observed little evidence of links between insomnia symptoms and markers of biological mechanisms of HIV-CVD. Our results raise the possibility that other mechanisms (e.g., behavioral factors) may be responsible for observed associations between insomnia symptoms and incident HIV-CVD. However, future studies examining biological mechanisms and utilizing a more comprehensive assessment of insomnia symptoms are warranted. Ultimately, elucidating mechanistic pathways of the insomnia-CVD relationship in people with HIV could identify novel targets for HIV-CVD prevention efforts.

Table 1. Linear Regression Analyses Examining Associations of Insomnia Symptoms with Biological Mechanisms of HIV-CVD									
	sCD14			IL-6			D-dimer		
	exp(b)	95% CI	p	exp(b)	95% CI	p	exp(b)	95% CI	p
Demographic-adjusted									
I do not have this symptom	1.00	—	—	1.00	—	—	1.00	—	—
Doesn't Bother	1.05	(0.99-1.10)	0.09	1.00	(0.87-1.15)	1.00	1.07	(0.89-1.28)	0.48
Bothers a Little	1.02	(0.98-1.06)	0.38	0.98	(0.89-1.09)	0.73	1.01	(0.88-1.15)	0.91
Bothers	1.02	(0.98-1.07)	0.31	1.07	(0.95-1.21)	0.28	1.10	(0.94-1.29)	0.22
Bothers a Lot	1.01	(0.97-1.06)	0.53	1.15*	(1.02-1.29)	0.03	1.11	(0.95-1.30)	0.18
Fully-adjusted									
I do not have this symptom	1.00	—	—	1.00	—	—	1.00	—	—
Doesn't Bother	1.04	(0.99-1.09)	0.13	0.99	(0.87-1.13)	0.87	1.06	(0.90-1.26)	0.49
Bothers a Little	1.00	(0.96-1.03)	0.93	0.94	(0.85-1.03)	0.19	0.98	(0.86-1.11)	0.75
Bothers	1.00	(0.96-1.05)	0.85	1.01	(0.90-1.14)	0.89	1.08	(0.92-1.26)	0.34
Bothers a Lot	1.01	(0.97-1.05)	0.70	1.07	(0.95-1.19)	0.25	1.06	(0.91-1.23)	0.47
Note. Biomarker variables are log-transformed to normalize the distributions.									
Demographic-adjusted: age, sex, race/ethnicity									
Fully-adjusted: age, sex, race/ethnicity, prevalent CVD, hypertension, diabetes, BMI, smoking, total cholesterol, statin use, hepatitis C infection, renal function, anemia, alcohol use, cocaine use, HIV-1 RNA viral load, CD4+ T cell count, ART regimen									
*significantly different from reference group									

PAPER SESSION:
SOCIAL CAPITAL AND BIOMARKER CORRELATES ACROSS THE LIFESPAN
Friday, March 13 from 4:15 to 5:30 pm

Abstract 1316
EARLY ADULTHOOD SOCIAL CAPITAL AND BIOMARKERS IN MIDDLE LIFE: EVIDENCE FROM THE 1958 BRITISH BIRTH COHORT

Stergiani Tsoli, MPhil, Alice Sullivan, PhD, Centre for Longitudinal Studies, Social Science, Daisy Fancourt, PhD, Behavioural Science and Health Institute of Epidemiology & Health, George B. Ploubidis, PhD, Centre for Longitudinal Studies, Social Science, University College London, London, United Kingdom

Objective: This paper sets out to examine the association between indicators of structural social capital over adulthood and health indicators in midlife.

Methods: We use data from the 1958 National Child Development Study (NCDS), a birth cohort study that includes all people born in Britain during 1 week in March 1958. We use data from 4 sweeps of the study 1981 (n = 12 537), 1991 (n = 11 469), 2000 (n = 11 419), and 2002–2004 (n = 9377), when study members were aged 23, 33, 42, and 44 to 46 years, respectively. As indicators of social capital, we use information on civic engagement and social participation for ages 23, 33 and 42. As outcomes of interest, we use haemostatic and inflammatory markers from the biomedical sweep at ages 44 - 46: C-reactive protein, fibrinogen, HbA1C, blood pressure, FEV1, HDL and LDL cholesterol and Body Mass Index (BMI). We will use latent class analysis and other suitable techniques to derive a longitudinal typology of social capital and we will explore the association of this typology of social capital with biomarkers in midlife. We will control for potential confounders. Also, we will address missingness with the most suitable technique.

Results/Discussion: To our knowledge, this is the first study that will explore the association of early adulthood social capital and objective

measures of health in the UK using a nationally representative birth cohort study. Potential implications for public health policy and interventions will be explored.

Abstract 1423

CLASSES OF SOCIAL CAPITAL, RACE-ETHNICITY, AND ASSOCIATIONS WITH CVD RISK AND DISTAL SURVIVAL IN THE WOMEN'S HEALTH INITIATIVE: A LATENT CLASS ANALYSIS

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Should social capital be considered in the assessment of cardiovascular disease (CVD) risk? Cardiovascular disease remains the leading cause of mortality in the US. Likewise, women's rates of CVD have increased to nearly mirror men's rates. The prediction of CVD includes both biomeasures and health behavior, yet previous literature has established a robust association between aspects of social capital and lower disease risk citing pathways of stress reduction and connectedness to resources. However, most studies focus on one measure of social capital (e.g. social support) and its association with CVD risk and/or mortality. Although literature assessing *unidimensional* aspects of social capital (i.e. single questionnaire measures) on health has laid a solid foundation for scholars to concede the inclusion of interpersonal factors in research, social environments are invariably more complex than what may be measured by singular questionnaires. Social capital comprises a multi-dimensional, cultural environment and should be captured by several representations of one's sociocultural milieu and perception. Social capital may also be systematically different across race-ethnicity-informed by cultural practices and values, and structural and socioeconomic variables. We endeavor to use a person-centered, data-driven approach (latent class analysis) to understand *classes*, or multi-dimensional representations, of social capital measured by several social variables in the Women's Health Initiative (WHI; N = 93,669), and their association with CVD risk and mortality. In addition, we are interested in whether social capital profiles vary across racial-ethnic groups which may identify novel areas of risk and resilience for ethnic minorities. Latent class analysis will be used to ascertain unmeasured membership of WHI respondents in "social capital" classes reflected in variables such as social support, religious attendance, marital status, etc. The bootstrap likelihood ratio test, Bayesian information criterion, entropy, and adjusted likelihood ratio test will be used to choose the optimal model. Class membership will be used to assess the probability of being associated with race-ethnicity, income, and education. Next, 3-step distal regression on survival on social capital class will be used to predict the incidence of CVD/mortality measured in years from baseline.

Abstract 1558

DAILY LIFE SOCIAL SUPPORT EXCHANGE IS ASSOCIATED WITH ENHANCED GLUCOCORTICOID RECEPTOR SENSITIVITY IN HEALTHY MIDDLE-AGED ADULTS

Thomas W. Kamarck, PhD, Anna L. Marsland, PhD, Psychology, Matthew F. Muldoon, MD, Medicine, Barbara Anderson, PhD,

Psychology, University of Pittsburgh, Pittsburgh, PA, Sheldon Cohen, PhD, Psychology, Carnegie Mellon, Pittsburgh, PA

Accumulating evidence implicates reduced immune cell glucocorticoid (GC) receptor sensitivity as a potential pathway linking psychosocial stress with systemic inflammation and chronic disease. Exposure to chronic social stressors (e.g., caring for a chronically ill relative) is known to be associated with decreases in GC receptor sensitivity, potentially reducing the body's capacity to mitigate inflammation. Little is known, however, about links between social relationship quality and GC sensitivity in the general population. In a sample of 219 healthy middle-aged adults (ages 40-64, 70 % female, 26 % nonwhite.; SHINE cohort), we administered a series of questionnaires, and conducted hourly electronic diary interviews over a 4-day period to assess daily life social interaction characteristics. On an hourly basis, we measured participants' experiences of social conflict and social support. We assessed GC sensitivity with whole blood samples incubated with lipopolysaccharide alone and with increasing concentrations of dexamethasone. High-sensitivity C-reactive protein (CRP) and interleukin-6 (IL-6) were also measured in circulation. Our area-under-the-curve (AUCi) measure of GC sensitivity was significantly associated with circulating CRP (partial $r = .14$, $p < .05$), as expected, after adjusting for age, race, sex, education, and BMI.

Contrary to prediction, none of our measures of chronic social stress (neither questionnaire nor ambulatory diary reports of social conflict exposure) were associated with AUCi. Unexpectedly, however, measures of positive relationship quality associated with GC receptor sensitivity: Those who experienced greater emotional support, on average, during daily life (e.g., frequent endorsement of items such as "someone expressed confidence in you") showed enhanced GC receptor sensitivity (lower AUC values denote greater sensitivity; partial $r = -.13$, $p = .05$, $n = 219$ after adjusting for age, race, sex, and education) as did those who offered assistance to others more frequently (e.g., endorsing items such as "you showed care/concern for another"; partial $r = -.15$, $p = .02$, $n = 219$). Social relationship quality may be associated with increased GC sensitivity among healthy adults. With replication, such findings point to one pathway through which social interactions may reduce risk for chronic disease morbidity. Supported by AG041778

Abstract 1802

LONELY DAYS: THE UNIQUE ROLE OF DAY-TO-DAY LONELINESS IN BIOMARKERS OF AGING AND PHYSICAL FUNCTION

Stephanie J. Wilson, PhD, Psychology, Southern Methodist University, Dallas, TX, Rachel E. Koffler, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

Lonelier people age more quickly than their less lonely counterparts, in terms of accelerated biological aging, higher inflamm-aging, and greater functional limitations. Notably, the literature has conceptualized loneliness as a stable, trait-like risk factor rather than an experience that can vary. The current study examined whether loneliness in daily life was associated, beyond trait loneliness, with higher levels of inflammatory marker interleukin (IL)-6, lower levels of aging biomarker insulin growth factor-1 (IGF-1), slower gait speed, and greater limitations to instrumental activities of daily living (IADLs). The sample included 1,000 middle-aged and older adults who participated in the National Study of Daily Experiences and the Biomarker Project of the Midlife in the United States study. For 8 consecutive evenings, participants rated how lonely they felt that day, from which person-level means and standard deviations were calculated. In a lab visit, they completed a timed 50-ft walk to index gait speed and reported IADLs. Fasting serum samples were assayed for IL-6 and IGF-1. Contrary to its traditional treatment as a trait, loneliness varied substantially day-to-day ($ICC = .57$). Consistent with prediction, those who were lonelier in daily life had lower IGF-1 than people whose daily lives were less lonely ($B(SE) = -10.1(4.7)$, $p = .033$), above and beyond trait loneliness, age, gender, comorbidities, BMI,

physical activity, smoking, alcohol use, education, and time between projects. Those with larger daily fluctuations in loneliness had higher IL-6 ($B(SE)=0.2(0.1)$, $p=.037$), regardless of their average loneliness. Likewise, larger daily fluctuations in loneliness predicted slower gait speed ($B(SE)=1.7(0.6)$, $p=.005$), regardless of the daily mean and beyond trait loneliness, age, gender, comorbidities, physical activity, and time between projects. Higher daily loneliness was linked to greater IADL difficulties ($B(SE)=0.2(0.1)$, $p=.048$), but became null when trait loneliness was included. These novel results reveal the unique importance of daily loneliness for objective measures of aging—beyond the widely studied effects of trait loneliness, which more strongly predicted self-reported IADLs. Both higher daily loneliness and larger fluctuations in loneliness, i.e., greater social fragility to daily experiences, may play key roles in paths toward unhealthy aging.

Abstract 1692

LATE-LIFE PSYCHOSOCIAL EXPOSURES AND THE HUMAN BRAIN MITOCHONDRIAL PROTEOME

Caroline Trumpff, PhD, Department of Psychiatry, Hans-Ulrich Klein, PhD, Department of Neurology, Columbia University, New York, NY, Carmen Sandi, PhD, Brain Mind Institute, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, David A. Bennett, PhD, Rush Alzheimer's Disease Center, Rush University Medical Center, Chicago, IL, Philip De Jager, PhD, Department of Neurology, Martin Picard, PhD, Department of Psychiatry, Columbia University, New York, NY

Background: Our ability to think and feel, and to generate (mal)adaptive stress responses requires adequate supply of energy, which is in large part produced by mitochondria within the brain. Studies in animals have found that chronic stress can have detrimental effects on brain mitochondrial function, particularly in prefrontal areas known to sustain executive functions in humans. Here, we examined the association between lifetime psychosocial exposures and mitochondrial health from postmortem human brains.

Methods: Data were from a subset of the longitudinal ROSMAP study that includes untargeted proteomic data from dorsolateral prefrontal cortex (dlPFC) ($N=160$). Psychosocial exposures were assessed yearly from age 65 at enrollment, with a follow-up range of 1-8 years. Measures of positive exposures included well-being, social activity/support; negative exposures included depression, anxiety, negative mood, stress, negative life events. To examine different functional components of mitochondria involved in energy transformation, we developed integrative multivariate indices representing energy production capacity, adjusted for mitochondrial content, for each individual complexes of the respiratory chain. Effect sizes were quantified with Spearman correlations. Ongoing analyses will validate these findings in a larger dataset and in an independent replication cohort.

Results: Preliminary analyses suggest a link between psychosocial factors and mitochondrial brain protein abundance, with small effect sizes in the expected directions. Overall, greater exposure to positive psychosocial factors was associated with higher abundance of specific mitochondrial energy production components, particularly Complex I. In contrast, higher negative psychosocial factors exposure was related to lower respiratory chain proteins abundance, possibly reflecting lower mitochondrial quality. Future analysis stratified by sex and late life cognitive trajectories are needed to establish the generalizability of these findings.

Conclusions: Our index-based mitochondrial phenotyping approach suggests that late-life psychosocial exposure may be related to brain dlPFC mitochondrial health. If replicated, these findings would suggest that mitochondrial recalibrations may constitute a potential pathway to transduce psychosocial factors into biological changes within the human brain and body.

PAPER SESSION:

SOCIAL EXPOSURE AND HEALTH VULNERABILITIES Friday, March 13 from 2:45 to 4:00 pm

Abstract 1546

WHEN IT RAINS, IT POURS--AND SEX MATTERS: DIFFERENCES IN PATTERNS OF CUMULATIVE LIFE ADVERSITY AND HEALTH IN A US NATIONALLY REPRESENTATIVE SAMPLE

Yasmin Barrientos Kofman, MA, Psychological Science, Dana Rose Garfin, PhD, Sue & Bill Gross School of Nursing, Ilona S. Yim, PhD, Roxane Cohen Silver, PhD, Psychological Science, University of California, Irvine, Irvine, CA

Experiences of abuse in child- and adulthood can have long-term mental and physical health consequences. While most previous studies linking abuse and health have relied on counts of type of abuse experienced, abuse rarely occurs in isolation. Thus, it is critical to understand the interrelationships between abuse and other life adversities that may add to cumulative burden. The present study implemented a person-centered approach to examine heterogeneity in cumulative, lifetime experiences of abuse and adversity and their associations with subsequent health.

Using a nationally representative U.S. sample of women ($n = 742$) and men ($n = 683$), a multi-group latent class analysis generated profiles of adverse experience exposure based on endorsement of life events. A four-class solution best fit the data: Class 1-High Abuse/High Adversity (7% of women; 6% of men), Class 2-Some Abuse/Moderate Adversity (28% of women, 25% of men), Class 3-Low Abuse/Some Adversity (34% of women, 18% of men), and Class 4-Low/No Abuse, Low/No Adversity (32% of women, 51% of men). While proportionally these classes were relatively similar, unique combinations of adverse experiences emerged within classes depending on sex. Most prominently, women in the High Abuse/High Adversity group were characterized by a high prevalence of poly-victimization, including sexual violence and other adversities (e.g., exposure to environmental stressors, financial strain); men in the High Abuse/High Adversity group were characterized by a high prevalence of physical harm/abuse and emotional abuse and other types of adversities (e.g., witnessing violence). Logistic regression analyses using Bonferroni adjusted alpha levels (all $ps \leq .003$) then examined associations between class membership and respondent reports of physician-diagnosed health conditions, adjusting for age, education, income, and ethnicity. For women, class membership was associated with chronic health conditions, including cardiovascular disease (CVD), anemia, STIs, depression, and anxiety disorders. For men, class membership was associated with CVD and depression only.

A person-centered, cumulative approach to life adversity appears informative. Patterns of cumulative experiences of adversity differ by sex, which in turn have implications for health long-term. These interrelationships could play a key role in women's health disparities.

Abstract 1202

COMMUNITY VIOLENCE EXPOSURE AND CORTISOL AWAKENING RESPONSES IN OVERWEIGHT/OBESE ADOLESCENTS

Jacob Wexler, High School, Tiwaloluwa Ajibewa, M.S., School of Kinesiology, Joyce Lee, M.D., MPH, Department of Pediatrics and Communicable Diseases, University of Michigan, Ann Arbor, MI, Claudia Toledo-Corral, Ph.D, M.P.H., Health Sciences, California State University, Northridge, CA, Rebecca Hasson, Ph.D, School of Kinesiology, University of Michigan, Ann Arbor, MI

BACKGROUND: Community violence exposure has been identified as a salient environmental stressor that is associated with glucocorticoid dysregulation in adolescents with overweight/obesity. Little is known regarding the specific type of violence exposure that is most detrimental to the regulation of the hypothalamic-pituitary-adrenal (HPA) axis. **PURPOSE:** To examine cross-sectional associations between community violence exposure (total exposure,

violence type) and cortisol awakening response (CAR) in adolescents with overweight/obesity. **METHODS:** One-hundred adolescents (ages: 13-19 years; 65% female; average BMI percentile: 93.8±4.13) were included in this analysis. Community violence exposure was measured using the Survey of Children's Exposure to Community Violence. Salivary cortisol collected across three days at awakening and 30 minutes post-awakening was used to calculate CAR area under the curve (AUC). **RESULTS:** Community violence exposure was negatively associated with CAR AUC ($\beta=-0.04\pm0.02$; $p=0.04$). This relationship remained significant when controlling for psychological stress, race, gender, bmi, and pubertal development ($\beta=-0.04\pm0.02$; $p=0.04$). When examining violence exposure by type, hearing gunshots was independently associated with a blunted CAR AUC ($\beta=-0.08\pm0.04$; $p=0.04$). No other significant associations were observed for other violence exposure types (punch/shove/kick, knife attack, shooting, or verbal abuse of a caregiver) with CAR AUC (all $p>0.05$). **CONCLUSION:** Community violence exposure was associated with glucocorticoid dysregulation in adolescents with overweight/obesity, and this relationship was driven by exposure to hearing gunshots. Future research should explore the long-term effects of hearing gunshots on HPA axis function in adolescents at increased risk for psychophysiological diseases.

Abstract 1649

EXPOSURE TO POLICE KILLINGS IN ONE'S COMMUNITY AND CORTISOL LEVELS AMONG URBAN BLACK MALE YOUTH

Baldwin Way, Ph.D., Psychology, Jodi Ford, Ph.D., Nursing, Jacob Tarrence, MS, Eric LaPlant, MS, Bethany Boettner, Ph.D., Kammi Schmeer, Ph.D., Sociology, Ohio State University, Columbus, OH, Catherine Calder, Ph.D., Statistics and Data Sciences, University of Texas at Austin, Austin, TX, Christopher Browning, Ph.D., Sociology, Ohio State University, Columbus, OH

Emerging evidence indicates that awareness of police killings in one's community is associated with negative health and wellbeing among Blacks. Yet, little is known about the biological consequences of heightened awareness of police killings for urban Black youth. We employ unique data from the 2014-16 *Adolescent Health and Development in Context* (AHDC) study – a representative sample of youth ages 11 to 17 residing in the Columbus, OH area. Participants ($N=585$; average age 14.7; 42% Black) contributed nightly saliva samples for cortisol for up to six days, providing an opportunity to link recent exposures to police killings within the residential county to hormonal differences during the study period. There were 6 police killings of Black individuals within Columbus during the study period. We find evidence of elevated (46%) average levels of nightly cortisol for Black boys in the 30 day period following a police killing of a Black victim, relative to Black boys studied in the 30 days before the police killing. We find no evidence of police killing effects on cortisol levels of Black girls or white youth. These analyses suggest that police killings trigger distress that influences the biological functioning of Black boys, with potential negative consequences for health.

Abstract 1769

HIGH STRESSOR EXPOSURE AND LOW STRESSOR DIVERSITY LINKED TO HIGHER BLOOD PRESSURE: FINDINGS ACROSS AGE AND SES

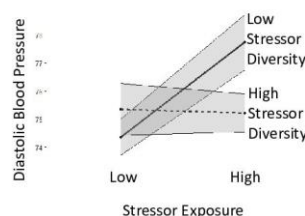
Rachel E. Koffer, PhD, Psychiatry, Kristina D. Dickman, BA, Thomas W. Kamarck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA Increased stress exposure has been linked to elevated blood pressure, indicating a potential pathway from stressful experiences to cardiovascular disease morbidity and mortality (Spruill, 2010; WHO, 2013). Recent evidence suggests stress exposure may be especially harmful when concentrated in one particular domain (i.e., low stressor diversity) (Koffer, Ram, Conroy, Pincus, & Almeida, 2016). Using a diversity index (scaled 0=no diversity to 1=complete diversity), the

present study tests whether the combination of high stressor exposure and low stressor diversity over four days of ecological momentary assessments is associated with high resting blood pressure, above and beyond the presence of exposure itself.

Additionally, sociodemographic characteristics, such as advanced age and low socioeconomic status (SES), place individuals at particular risk for cardiovascular disease, which may be partly due to lifetime stress accumulation (Lakata, 2002; Steptoe, & Kivimäki, 2013). Previous literature has suggested that older adults experience lower stressor diversity (Brose, Scheibe, & Schmiedek, 2013; Koffer, et al., 2016). Associations between lower SES and stressor diversity have not yet been tested, but evidence for stressor exposure by domain is mixed (Grzywacz, Almeida, Neupert, & Ettner 2004). The present study is the first to investigate whether age and SES are associated with differences in momentary stressor exposure and stressor diversity.

Participants included 391 adults aged 40-64 years who completed a four-day ambulatory procedure in which they provided hourly self-report of stressful experiences, with clinic blood pressure separately assessed. Linear regression models were used to examine the associations among blood pressure, stressor exposure, stressor diversity, age, and SES. Older age ($B = -0.003$, $p = .003$) and lower SES ($B = 0.026$, $p = .004$) were both associated with lower stressor diversity, after controlling for race and gender. Further, higher stressor exposure combined with lower stressor diversity was associated with higher diastolic blood pressure ($B = -7.21$, $p = .046$; see Figure 1). Experiencing high stress concentrated in one domain may place individuals at risk of high blood pressure. We discuss how low stressor diversity may help explain age and SES disparities in cardiovascular disease.

Figure 1. Stressor Diversity Moderates the Effects of Stressor Exposure on Diastolic Blood Pressure



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Abstract 1709

AMERICAN INDIAN YOUNG ADULTS DISPLAY DIMINISHED CARDIOVASCULAR AND CORTISOL RESPONSES TO ACUTE PSYCHOLOGICAL STRESS

Cory J. Counts, B.S., Psychology, Montana State University, Bozeman, MT, Annie T. Ginty, Ph.D., Hannah E. Gruman, current undergraduate student, psychology, Baylor university, Waco, TX, Neha A. John-Henderson, Ph.D., Psychology, Montana State University, Bozeman, MT

The indigenous people of the United States, or American Indians (AIs) and Alaska Natives (ANs), are a diverse population, comprised of over 550 federally recognized tribal nations. Public health issues have

changed dramatically for this population. American Indian adults are at an increased risk for cardiovascular disease compared with non-Hispanic white adults. As recently as 40 years ago, the rates of the risk factors for cardiovascular disease were low in these communities. However, several recent studies have shown that incidence of cardiovascular disease (CVD), and its risk factors, including obesity and diabetes, are increasing in this growing population. Scant research exists examining the underlying physiological and psychological mechanisms associated with these risks. This study aimed to examine possible psychological and physiological stress-related mechanisms related to cardiovascular disease risk in healthy American Indian and non-Hispanic white adults. Forty American Indian (60% female, mean age = 19.93, SD = 2.08 years) and 45 non-Hispanic white (70% female, mean age = 20.18, SD = 2.22 years) participants attended an in-person laboratory session. Salivary cortisol and cardiovascular activity were measured before (baseline), during, and after exposure to a 10-minute mental arithmetic task. Compared to non-Hispanic white participants, American Indian had diminished salivary cortisol ($p < .001$), blood pressure (p 's $< .001$), and heart rate ($p = .041$) responses to acute psychological stress. These effects could not be accounted for by differences in task performance or self-reported engagement. Further, the observed findings were independent of hip to waist ratio, depression, and body mass index (BMI). Previous research has shown that exaggerated responses to stress are associated with increased risk of cardiovascular disease. However, diminished responses to stress are associated with early childhood stress and future adverse behaviors (e.g., addiction, obesity). Diminished reactivity may influence behaviors that can impact future development of cardiovascular disease in American Indian populations.

PAPER SESSION:
SOCIOECONOMIC STATUS AND HEALTH
Thursday, March 12 from 10:30 to 11:30 am

Abstract 1331

SUBJECTIVE SOCIAL STATUS AND DIFFERENCES IN AFFECTIVE RESPONSES TO ACADEMIC AND INTERPERSONAL STRESS IN ADOLESCENCE

Danny Rahal, MA, Psychology, Andrew J. Fuligni, PhD, Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA

Although lower socioeconomic status is robustly related to poorer health outcomes, low subjective social status (SSS)—one's subjective appraisal of status—in society and in school can poise individuals for poorer health (Quon & McGrath, 2014). Low SSS may shape health through exacerbating responses to stress. Indeed, youth of lower status interpret ambiguous cues as more threatening and report greater emotional responses to threat (Chen & Matthews, 2001; Rahal et al., 2019). Using a three-wave accelerated longitudinal design, this study investigated whether school and society SSS relate to daily affect and modulate affective responses to ecological stressors—daily conflicts and academic exam performance—during late adolescence.

The sample comprised 335 adolescents. During the first wave, 10th and 11th graders reported their school and society SSS and completed 14 daily diaries, reporting depressive mood, anxiety, fatigue, and positive mood. They also reported whether they did well on an exam, did poorly on an exam, and experienced arguments with friends or family members. They repeated this protocol for the second and third waves, two and four years later respectively. Three-level multilevel models with days nested within years within adolescents assessed whether society and school SSS relate to each form of affect, controlling for ethnicity, gender, age, income, parental education, and previous day's affect. Then, interaction terms were added to test whether society and school SSS moderate effects of daily stressors on affect.

Adolescents of lower society SSS reported more depressive mood ($B = -.03$, $SE = 0.01$) and fatigue ($B = -.04$, $SE = 0.02$), whereas adolescents of low school SSS reported less positive mood ($B = 0.07$, $SE = 0.02$). School SSS, but not society SSS, moderated affective responses to

stressors. Adolescents of low school SSS showed blunted reactivity to doing poorly on a test, with respect to depressive mood, fatigue, and positive mood relative to adolescents of average and high school SSS (Fig. 1). Interestingly, they also showed greater reactivity to conflict, with respect to depressive mood, anxiety, and positive mood (Fig. 2). Youth low in school SSS may be less invested in academic work and more sensitive to conflict. Status-based differences in affect and affective reactivity may contribute to status-based disparities in academics and well-being.

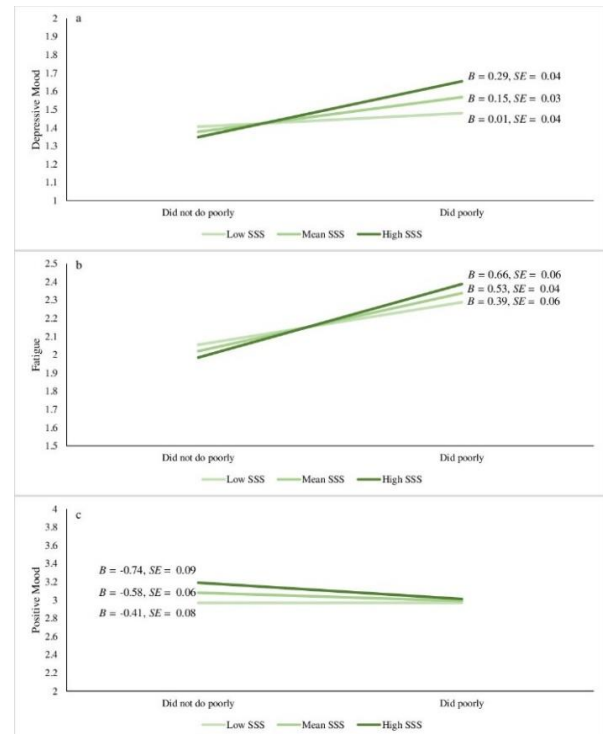


Figure 1. Differences in depressive mood (a), fatigue (b), and positive mood (c) as a function of doing poorly on a test and school SSS. Overall youth of higher SSS show greater affective responses to stress.

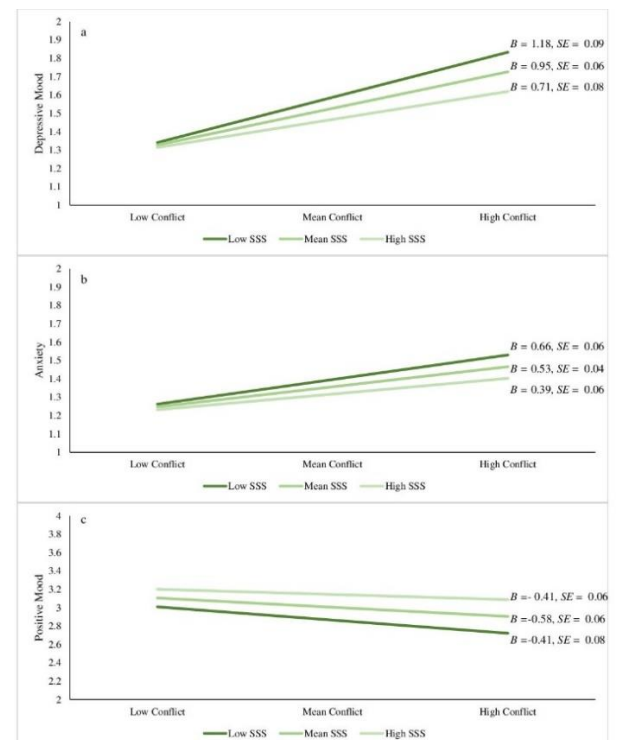


Figure 2. Differences in depressive mood (a), anxiety (b), and positive mood (c) as a function of experiencing conflict (i.e., arguments, getting trouble in school) and school SSS. Overall youth of lower school SSS show greater affective responses to conflict.

Abstract 1167**IS THE ASSOCIATION BETWEEN PURPOSE IN LIFE AND MORTALITY MODIFIED BY KEY SOCIAL STRUCTURAL FACTORS?**

Koichiro Shiba, MPH, Eric Kim, PhD, Department of Social and Behavioral Sciences, Tyler VanderWeele, PhD, Department of Epidemiology, Laura Kubzansky, PhD, Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Introduction: Accumulating evidence indicates a higher sense of purpose in life is associated with reduced risk of chronic disease and mortality. Yet, whether associations between purpose in life and mortality differ depending on key social structural factors (i.e., education, income, wealth, race/ethnicity, and gender) remains unknown. In this study, we evaluated potential effect modification by these five factors.

Methods: We used prospective data from the Health and Retirement Study (N=13,770), a nation-wide study of U.S. adults aged >50. Purpose in life was measured at baseline using the purpose subscale of the Ryff Psychological Well-Being Scales. Over 8 follow-up years, death was assessed via the National Death Index. Poisson regression was used to estimate the risk ratios for mortality, as the outcome was not rare. To evaluate effect modification, for each social structural factor, we ran a set of adjusted models (with relevant demographic factors, baseline chronic conditions, depression), with product terms between each purpose quartile and the social structural factor. We evaluated potential effect modification on both an additive and multiplicative scale.

Results: Across most levels of each social structural factor, increasingly higher purpose levels were associated with a progressively lower risk of mortality. We observed modest evidence of multiplicative effect modification by race/ethnicity and gender. The relative risk of mortality among those in the highest vs lowest quartile of purpose was lower in women vs men ($RR_{\text{women}}: 0.65$, 95% CI: 0.55-0.76; $RR_{\text{men}}: 0.79$, 95% CI: 0.68-0.93); and lower in Blacks vs whites ($RR_{\text{blacks}}: 0.57$, 95% CI: 0.42-0.78; $RR_{\text{whites}}: 0.76$, 95% CI: 0.67-0.86). For all markers of socioeconomic status (SES; educational attainment, household income, total household wealth), we observed modest evidence of effect modification on the additive and multiplicative scales. Associations between higher vs lowest quartiles of purpose and lower risk of mortality were somewhat stronger among higher vs lower SES groups.

Discussion & Conclusion: Across education, income, wealth, race/ethnicity, and gender, increasingly higher purpose levels were associated with progressively lower mortality risk. Within each social structural factor, some subgroups benefitted slightly more from the protective effect of purpose than others.

Abstract 1819**LESS OF THE GOOD LIFE: DO VARIATIONS IN POSITIVE LIFE EXPERIENCES CONTRIBUTE TO SOCIOECONOMIC DISPARITIES IN HEALTH?**

Tara Gruenewald, PhD, Psychology, Chapman University, Orange, CA, Anthony Ong, PhD, Human Development, Cornell University, Ithaca, NY, Danielle Zahn, BA, Natalie Standridge, HS, Erin Bonham, HS, Psychology, Chapman University, Orange, CA

Although a greater experience of stress is often posited to be a pathway through which socioeconomic adversity (SA) is linked to poor health and well-being, our prior research also suggests that a deficit of positive experiences may likewise contribute to SA gradients in physiological dysregulation. This study extends prior work by examining whether the frequency of positive experiences and event-associated affect predict the odds of poor self-rated health, disability and mortality over ten years and whether positive life experiences partially underlie hypothesized SA gradients in these outcomes. Analyses utilized data from the second (MII) and third (MIII) waves of the Midlife in the U.S. (MIDUS) Study (n=1,048, age 34-84, 54.8% female, 92% non-Hispanic white). SA was measured at

MII with a composite of education level, poverty to income ratio, perceived financial situation, ability to meet basic needs, and difficulty paying bills. The frequency (never to 7+ times in last month) of 49 positive life experiences (e.g., seeing beautiful scenery) and associated enjoyment were assessed with the Positive Events Schedule at MII. Health indicators assessed ten years later (MIII) included self-rated health, impairment in activities of daily living (ADLs), and mortality. Analyses including age, sex, and baseline health covariates indicated that greater SA was associated with lower frequency of positive life experiences but not variations in the enjoyment associated with experiences. Greater SA predicted greater odds of poor self-rated health (OR=1.37, 95% CI=1.23, 1.52) and greater ADL impairment ($B=-.23^{***}$). Greater frequency of positive experiences also predicted lower odds of poor self-rated health (OR=0.16, 95% CI= 0.05, 0.48), lower ADL impairment ($B=-.14^{***}$), and marginally lower odds of mortality (OR=.41, 95% CI= 0.15, 1.14). Inclusion of positive experiences accounted for approximately 5-7% of the associations between SA and these outcomes. Findings indicate that those with greater levels of SA experience fewer positive life experiences and this lower frequency may explain a small portion of the poorer health over time in those with greater SA.

Abstract 1345**THE RELATIONSHIP BETWEEN RECIPROCAL SOCIAL SUPPORT AND METABOLIC AND INFLAMMATORY OUTCOMES DEPENDS ON SOCIOECONOMIC CONTEXT**

Makeda Austin, MS, Psychology, Northwestern University, Chicago, IL, Jane N. Ngozi, BA, Rebekah Siliezar, BA, Johanna Deziel, BA, Edith Chen, PhD, Psychology, Northwestern University, Evanston, IL

Most research examining the health benefits of social support focuses on support that people receive. However, few studies have examined the health effects of reciprocal social support (amount of support received relative to support given). This study examines the association of reciprocal social support on metabolic and inflammatory outcomes in a sample of adult parental caregivers, and whether these effects vary by socioeconomic status (SES).

We enrolled a sample of 307 parents ($M_{\text{age}} = 45$; 88% female) residing with a child with asthma. Parents provided SES information including household income and an interview-based measure of financial stress. Neighborhood SES (percentage of families living below federal poverty-level) was calculated from census data. Parents completed the 2-Way Social Support Scale, which assesses social support across four dimensions: support received; support given; emotional support; and instrumental support (i.e. help with childcare or transportation). Reciprocal social support was calculated by subtracting the receiving support score from the giving support score. Both emotional and instrumental reciprocal support scores were calculated. For health measures, parents were assessed on metabolic outcomes (systolic blood pressure (SBP) diastolic blood pressure (DBP) body fat percentage, and total cholesterol) and inflammatory outcomes (basal Interleukin-6 (IL-6) and high sensitivity C-reactive protein (CRP)).

Hierarchical regression analyses revealed significant interactions between reciprocal instrumental support and SES in predicting metabolic and inflammatory outcomes, after covariate adjustment. Receiving more instrumental support than they gave was associated with higher SBP, cholesterol, and body fat percentage only among parents with lower SES. Interactions held for family income (interaction p's ranging from .02-.07) and financial stress ratings (p's ranging from .03-.08). For inflammatory outcomes, receiving more instrumental support than they gave was associated with higher IL-6 ($p < .05$) and CRP ($p = .06$) only for parents from lower SES neighborhoods. No effects were found for reciprocal emotional support.

These findings suggest parents with lower SES may experience receiving more instrumental social support than they give to others as a burden that comes with a physiological cost, one not experienced by parents with higher SES.

PAPER SESSION:
STRESS AND BIOBEHAVIORAL PATHWAYS IN CANCER
Friday, March 13 from 4:15 to 5:30 pm

Abstract 1668

RELATIONSHIP SATISFACTION, STRESS, AND INFLAMMATION IN BREAST CANCER SURVIVORS

M. Rosie Shrout, PhD, Institute for Behavioral Medicine Research, Megan E. Renna, PhD, The Comprehensive Cancer Center, Annelise A. Madison, MA, Janice K. Kiecolt-Glaser, PhD, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH

Breast cancer survivors in satisfying relationships are less distressed and have better health outcomes compared to those in less satisfying relationships. Survivors' stress and age are also associated with inflammation—a key predictor in breast cancer metastasis, recurrence, and mortality. This longitudinal study assessed the health-enhancing effects of highly satisfying relationships on survivors' stress and inflammation. The design allowed for assessment of within- and between-person differences, offering a novel window into how changes in survivors' relationship satisfaction from visit to visit predict within-person changes in stress and inflammation. Participants were women with breast cancer ($n = 139$, mean age = 56, 81% White) stages 0-IIIc who completed a baseline visit before treatment and two follow-up visits 6 and 18 months after treatment. At each visit, women completed measures assessing their relationship satisfaction and perceived stress, and blood draws were done to examine CRP and cytokines. In addition to CRP, a z-score composite of serum cytokines (TNF α , IL-6, and IL-1 β) was calculated to obtain a summary inflammation measure. All analyses adjusted for comorbidities, cancer treatment, BMI, daily activity level, and time. Multilevel moderated mediation analyses revealed significant within-person, but not between-person, indirect effects predicting CRP (conditional effect = -.001, CI = [-.001, -.000]) and the z-score composite (conditional effect = -.002, CI = [-.003, -.001]). These results indicate that, from visit to visit, the more satisfied survivors were with their relationships, the less stressed they felt, which in turn led to lower than their own average levels of inflammation. Further, significant conditional effects indicate that only older women reaped the stress- and inflammation-lowering benefits of highly satisfying relationships. These results demonstrate the importance of assessing fluctuations in survivors' own relationship and stress perceptions—rather than how their relationships and stress compare to other survivors—in understanding how they contribute to changes in inflammation throughout breast cancer treatment. These findings highlight the power of relationships, particularly among older women, in protecting immune function before and after breast cancer treatment.

Abstract 1069

A DYADIC ANALYSIS OF FEAR OF RECURRENCE AND DAILY SLEEP DISTURBANCE AMONG RECENTLY DIAGNOSED BREAST CANCER PATIENTS AND THEIR INTIMATE PARTNERS

Emily C. Soriano, MA, Christine Perndorfer, MS, Psychological & Brain Sciences, University of Delaware, Newark, DE, Amy K. Otto, PhD, Department of Health Outcomes and Behavior, Moffitt Cancer Center, Tampa, FL, Scott D. Siegel, PhD, MHCDS, Value Institute, Christiana Care Health System, Newark, DE, Jean-Philippe Laurenceau, PhD, Psychological & Brain Sciences, University of Delaware, Newark, DE

Background: Increasingly recognized as a core aspect of psychosocial adjustment in cancer survivorship, fear of cancer recurrence (FCR) is highly prevalent among both patients and their spouses. FCR has been associated with a number of poor psychological and behavioral outcomes. However, the effect of FCR on sleep disturbance—a common symptom associated with adverse health consequences for breast cancer (BC) patients—is not well understood. This study aimed

to assess the relationship between global FCR and daily sleep disturbance in BC patients and their spouses.

Methods: After completing adjuvant treatment ($M = 5$ months post-surgery), 76 early-stage BC patients and their spouses completed three validated measures of global FCR shortly before beginning a 21-day diary period, during which participants self-reported their sleep duration in hours, perceived quality, difficulties falling asleep (sleep onset latency; SOL), and wake after sleep onset (WASO) each morning upon waking. Using actor-partner interdependence modeling, average levels of each sleep item were then regressed on a latent FCR factor.

Results: For patients and spouses, the effect of global FCR on one's own average daily sleep disturbance (*actor effect*) was statistically significant (all $p < .01$) for three of the four sleep outcomes (the exception being WASO). Specifically, greater FCR was associated with shorter sleep duration (standardized patient β (β_p) = -0.33; spouse β (β_s) = -0.28), poorer perceived sleep quality ($\beta_p = -0.23$; $\beta_s = -0.25$), and greater SOL ($\beta_p = 0.27$; $\beta_s = 0.30$). There was little evidence of effects of one partner's FCR on the other's sleep (*partner effects*)—all but one partner effect was non-significant ($p > .05$), the exception being the partner effect of FCR on perceived sleep quality ($\beta_p = -0.28$; $\beta_s = -0.28$, both $p < .01$).

Conclusions: These findings extend prior research by demonstrating significant and sizeable associations between FCR and sleep disturbance in couples early in survivorship. Results may inform future elaboration of theoretical models of FCR, which often posit other health behavior consequences (e.g., body-checking behavior) but thus far rarely sleep behavior. Because sleep disturbance has been linked to all-cause and BC-related mortality among survivors, this study further highlights the importance of addressing excessive FCR in clinical practice.

Abstract 1534

EFFECTS OF BRIEF STRESS MANAGEMENT INTERVENTIONS ON LEUKOCYTE NUCLEAR NF κ B EXPRESSION DURING PRIMARY TREATMENT FOR BREAST CANCER

Chloe Taub, MA, Psychology, University of Miami, Coral Gables, FL, Alain Diaz, PhD, Bonnie Blomberg, PhD, Microbiology and Immunology, University of Miami Miller School of Medicine, Miami, FL, Hannah Fisher, MS, Erica Nahin, MS, Molly Ream, BA, Emily A. Walsh, BA, Psychology, University of Miami, Coral Gables, FL, Suzanne Lechner, PhD, Department of Psychiatry and Behavioral Sciences, University of Miami Miller School of Medicine, Miami, FL, Michael Antoni, PhD, Psychology, University of Miami, Coral Gables, FL

Background. Prior work has shown that breast cancer (BCa) patients receiving 10 weeks of stress management after surgery show decreased inflammatory signaling over 12 months of primary treatment, which predicts longer 11-year disease-free survival. Newly developed brief 5-week stress management interventions teaching cognitive behavioral (CB) or relaxation training (RT) techniques delivered post-surgically also show decreases in distress and inflammatory markers relative to time- and attention-matched health education (HE), but the molecular processes supporting these effects remain unknown. We examined the effects of the 5-week CB and RT vs HE on NF κ B DNA binding in leukocyte cell nuclei in a high-distress subsample of women undergoing primary treatment for BCa.

Methods. Blood samples for electromobility shift assay for NF κ B DNA binding in leukocyte nuclei and self-report distress measures (Affects Balance Scale-Negative Affect [ABS-NA], Impact of Events Scale-hyperarousal [IES-H] and intrusive thoughts [IES-I]) were collected at baseline and 12 months. Repeated measures analyses compared changes in NF κ B expression by condition, controlling for age, stage of cancer, days from surgery to baseline, and intercurrent receipt of chemotherapy and radiation. Regression analyses related NF κ B expression to self-report measures.

Results. Study condition was associated with changes in NFκB (in optical density units) over 12 months, $F(1, 41)=4.66, p=0.037$. NFκB expression significantly increased over time for HE and did not change for those assigned to RT or CB. Greater increases in perceived stress-management skills from pre-to post-intervention predicted less subsequent increase in NFκB expression over the 12-month follow-up ($F[1,43]=5.303, \beta=-0.331, t[43]=-2.303, p=0.026$). Women in CB or RT who showed no increase in NFκB DNA binding over 12 months showed the greatest stress management skill improvement. For women assigned to CB or RT, lower levels of NFκB expression at 12-month follow-up were also related to less ABS-NA ($\beta=0.430, t[28]=2.537, p=0.017$), IES-H ($\beta=0.552, t[28]=3.079, p=0.005$), and IES-I ($\beta=0.507, t[28]=2.869, p=0.008$).

Conclusions. Women assigned to the stress management conditions showed decreased NFκB DNA binding over 12 months and perceived skill improvements after training and lower distress was associated with lower NFκB expression.

Abstract 1388

RESULTS OF A PILOT RANDOMIZED CONTROLLED TRIAL A COUPLE-BASED MEDITATION INTERVENTION FOR PATIENTS WITH METASTATIC LUNG CANCER AND THEIR PARTNERS

Kathrin Milbury, PhD, Sania Durrani, MPH, Behavioral Science, Yisheng Li, PhD, Biostatistics, Zhongxing Liao, MD, Radiation Oncology, Lorenzo Cohen, PhD, Eduardo Bruera, MD, Palliative, Rehabilitative and Integrative Medicine, The University of Texas MD Anderson Cancer Center, Houston, TX

Background: Although mindfulness-based interventions have been widely examined in patients with early stage cancer, the feasibility and efficacy of these types of programs are largely unknown in the palliative care setting. We developed a couple-based intervention integrating meditation training with emotional disclosure exercises to target psychological distress in patients with metastatic lung cancer and their partners.

Methods: Dyads completed baseline self-report measures and were then randomized to a couple-based meditation (CBM), a supportive-expressive (SE), or a waitlist control (WLC) group. Couples in the CBM and ES groups attended 4 weekly, 60 min. therapist-led sessions that were delivered via FaceTime. All groups were reassessed 1 month and 3 months later.

Results: Seventy-five patients (51% female; mean age=64 years) and their partners' (52% female; mean age=64 years) were randomized (63% consent rate) of which 79% completed the first and 65% completed the second follow-up assessments. Attrition was mainly due to patients' death (44%). Although attendance was high in both groups (means: CBM=3.12; SE=3.08), dyads in the CBM group indicated greater benefit ($P<.003$) and usefulness ($P<.05$) of the sessions compared to those in the SE group. Compared with the WLC group, patients in the CBM group reported significantly lower depressive symptoms ($P=.02; d=.49$; CES-D means: CBM=7.87; SE=11.51; WLC=12.76) and cancer specific distress ($P=.05; d=.44$; IES means: CBM=12.40; SE=16.34; WLC=18.22). Similarly, compared with the WLC group, partners in the CBM group reported significantly lower depressive symptoms ($P=.02; d=.58$; means: CBM= 7.18; AC=8.91; WLC=11.62). For both patients and partners, there were no effects between SE and WLC groups. While small effects ($d=.22-.42$) in favor of the CBM group relative to the SE group were revealed, these differences were not significant.

Conclusion: It seems to be feasible, acceptable and possibly efficacious to deliver dyadic interventions via FaceTime to couples coping with metastatic lung cancer. Mindfulness-based interventions may be of value to manage symptom burden in the palliative care setting.

PAPER SESSION:

THINKING OUTSIDE THE PSYCHOSOMATIC MEDICINE BOX

Friday, March 13 from 1:30 to 2:30 pm

Abstract 1290

A SOCIAL ANALGESIC? ACETAMINOPHEN INCREASES AGGRESSIVE BEHAVIOR

Dominik Mischkowski, PhD, Psychology, Ohio University, Athens, OH, Balwin Way, PhD, Haemi Nam, MA, Psychology, Ohio State University, Columbus, OH

Acetaminophen (the active ingredient in Tylenol) is a potent physical painkiller but also reduces empathy for other people's pains (Mischkowski, Crocker, & Way, 2016). Acetaminophen is easily available over-the-counter, and an estimated 23% of all US-American adults consume a drug containing acetaminophen each week (Kaufman, Kelly, Rosenberg, Anderson, & Mitchell, 2002). In combination with acetaminophen's effect on empathy, these high consumption rates suggest that acetaminophen may have broader "social" side-effects than previously assumed. If acetaminophen reduces empathetic responsiveness for others' pains, it may also increase the willingness to inflict actual pain on other people, i.e., it may increase aggressive behavior.

We tested this hypothesis across five randomized, double-blind, placebo-controlled experiments (total $N=608$). In each experiment, participants received a 1000 mg acetaminophen or an inactive placebo and later completed a well-established measure of aggressive behavior, a modified version of the Taylor Aggression Paradigm (e.g., Bushman & Baumeister, 1998). Across 10 trials, participants were provided with the opportunity to deliver loud and long blasts of white noise to a game opponent, which was simulated by the computer. Meta-analytically integrating results across studies indicated that acetaminophen increased aggressive behavior (fixed-effects model: $pr = .08$, 95% CI [.03, .14]; random-effects model: $pr = .10$, 95% CI [.01, .20]). Follow-up mediation analyses suggested that reduced empathic perceptions of noise pain for the opponent accounted for the effect of acetaminophen on aggression, though more data is needed to conclusively demonstrate this mechanism.

These results are worrisome because they suggest that acetaminophen may have costly "social" side-effects. Aggressive behavior has immense personal, interpersonal, and societal costs, and thus imposes an estimated societal burden of more than 70 billion dollars per year on the US alone (Corso, Mercy, Simon, Finkelstein, & Miller, 2007). Because of acetaminophen's high consumption rates, it is possible that this painkiller substantially contributes to these costs despite the small size of the effect of acetaminophen on aggression (Cohen, 1988). More research is needed to assess the societal burden of increased aggression by acetaminophen and other prescription-free painkillers.

Abstract 1809

BEETROOT JUICE ATTENUATES BLOOD PRESSURE ELEVATIONS: A REVIEW OF FINDINGS AND A PROOF-OF-CONCEPT TRIAL OF BLOOD PRESSURE IN SUSTAINED ACUTE STRESS

Thomas Ritz, Ph.D., Chelsey A. Werchan, MA, Juliet L. Kroll, MA, Psychology, Southern Methodist University, Dallas, TX, Danielle A. Young, PsyD, Annie T. Ginty, Ph.D., Psychology, Baylor University, Waco, TX, David Rosenfield, Ph.D., Psychology, Southern Methodist University, Dallas, TX

Chronically elevated blood pressure in stressful life periods may exert adverse effects on cardiovascular health. Although behavioral and lifestyle interventions have been proposed to mitigate such effects, they are time intensive and adherence is often low. Dietary interventions such as sodium intake restriction may provide an alternative avenue but require major changes in dietary habits that are difficult to maintain. A more convenient dietary intervention may be beetroot juice intake, which has previously been shown to lower blood pressure and improve aspects of exercise performance. It is a source of

dietary nitrate, which is converted after ingestion to nitrite and subsequently nitric oxide, which acts as vasodilator. A closer review of the literature shows that as little as one daily 70mL-dose of beetroot juice, containing 5-7 mmol of nitrate, is capable of exerting vasodilatory effects. We therefore tested in a proof-of-concept trial, effects of beetroot juice on cardiovascular activity during students' academic finals, a period of acute stress that is sustained over days. Seventy-six students received either 7-day supplementation with one daily dose of 70mL beetroot juice or no supplementation during their final exam period. Systolic and diastolic blood pressure, heart rate, stress, and exhaled nitric oxide were measured at baseline during the semester and at two time points early and late during the finals. Assessors were blinded to the condition assignment of participants. Significantly higher exhaled nitric oxide in the intervention group ($p<.019$) confirmed nitric oxide-generating effects of beetroot juice. Controlling for baseline systolic blood pressure and stress, those receiving the supplement showed lower ($p=.040$) and declining ($p=.013$) systolic blood pressure during the finals. However, average levels of systolic blood pressure throughout the finals were in the normal range. Thus, beetroot juice may help mitigate some of the effects of stress on blood pressure, but more research is needed with populations at risk for cardiovascular disease.

Abstract 1400

ARE PEOPLE WITH GREATER CARDIOVASCULAR REACTIVITY SMARTER, HAPPIER, AND HEALTHIER? COUNTERINTUITIVE FINDINGS IN THE DUNEDIN AND MIDUS STUDIES

Kyle J. Bourassa, Ph.D., *Center for the Study of Aging and Human Development, Duke University Medical Center, Durham, NC*, Terrie E. Moffitt, Ph.D., *Avshalom Caspi, Ph.D., Psychology & Neuroscience, Duke University, Durham, NC*

Background:

Greater cardiovascular reactivity (CVR) is a well-established predictor of poorer health. CVR is thought to lead to the progression of cardiovascular diseases and increased risk of cardiovascular-related mortality through atherosclerotic processes over time. Termed the CVR hypothesis, this observation has led to the inclusion of CVR assessments in large cohort studies as a potential health-relevant biomarker.

Methods:

Participants from the Dunedin Study ($n = 937$) and Midlife in the United States (MIDUS) study ($n = 1,173$) completed a CVR laboratory paradigm that included a baseline assessment and two computerized stressors—a Stroop task and a math task. CVR was measured using the average increase in heart rate and blood pressure from baseline to the stressful tasks. We tested the hypothesis that greater CVR would be associated with worse status for childhood predictors, midlife correlates, and objective health outcomes.

Results:

Contrary to our predictions, greater CVR was associated with putatively positive status in terms of predictors, correlates, and outcomes in both the Dunedin and MIDUS studies. Participants with greater CVR experienced less difficult childhoods in both studies, and had higher childhood IQ in the Dunedin Study. Similarly, participants with greater CVR had better scores on life satisfaction, perceived stress, conscientiousness, self-reported health, cognitive abilities, and physical health biomarkers in midlife. These associations were consistent across studies. Finally, people with greater CVR had better health outcomes in both studies—Dunedin participants with greater CVR had a slower biological aging and younger later facial age, and there was some evidence that MIDUS participants with higher CVR had decreased risk of early mortality.

Conclusions:

Data from over 2,000 participants in two longitudinal studies evidenced that greater CVR was associated with better outcomes, as measured by a variety of constructs across the lifespan. These counterintuitive results may provide evidence in opposition to the

CVR hypothesis. Alternatively, given the range of positive outcomes associated with greater CVR, the computerized stressor tasks used in these studies may not reliably assess CVR as envisioned by the CVR hypothesis and suggests that greater attention should be given to the type of stressors used in studies of CVR.

Abstract 1757

STRATEGIES TO SUPPORT MINORITY WOMEN IN HEALTH SCIENCES: RESULTS FROM TWO ROUNDTABLES BETWEEN THE APA SOCIETY FOR HEALTH PSYCHOLOGY (DIVISION 38) DIVERSITY COUNCIL WITH APS AND APA MEMBERS

Patricia I. Moreno, PhD, *Medical Social Sciences, Northwestern University Feinberg School of Medicine, Chicago, IL*, Marcia M. Tan, PhD, *Public Health Sciences, University of Chicago, Chicago, IL*, Diana A. Chirinos, PhD, *Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, IL*

As demonstrated by National Institutes of Health (NIH) and National Science Foundation (NSF) research, minority women, including women from underrepresented racial/ethnic groups or disadvantaged backgrounds and women with disabilities, face unique and significant challenges in graduate school and beyond in health-related scientific fields. Yet, minority women have limited opportunities to directly communicate their needs to organizations in order to improve resources and available support. Therefore, the American Psychological Association (APA)'s Society for Health Psychology (Division 38) Diversity Council partnered with APS and APA's Society for the Psychology of Women to have honest conversations together with a community of minority women peers about their experiences in training and the workforce, as well as to build connections and network with one another. Across two roundtables with minority women in health sciences ($N = 40$) of diverse backgrounds and career stages, we identified issues specific to minority women (i.e. "What challenges in the field of health sciences have you faced as a minority woman or observed as an ally?") and discussed needed changes to support minority women's development as health sciences professionals (i.e., "How might professional organizations, such as APA, create diversity initiatives to support minority women?"). We also reviewed various funding opportunities to promote diversity in health-related research available to minority women. Results from a qualitative thematic analysis of these roundtables identified: 1. challenges pertaining to minority women, 2. approaches to support one another across stages of career, and 3. strategies to improve organizational support of minority women. We will also invite all individuals who identify as minority women and allies to provide interactive feedback on efforts to support minority women. This community-engaged study represents a step towards ensuring that organizations in the psychological sciences continue to build a diverse community of health science professionals that represent the populations we hope to serve.

How to Cite Your Abstract

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