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Abstracts

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

CITATION POSTERS

1) Abstract 1361

ATTACHMENT ANXIETY MODERATES THE ASSOCIATION BETWEEN TIME SPENT WITH EX-PARTNER AND SLEEP EFFICIENCY FOLLOWING DIVORCE

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Marital disruption in midlife is associated with increased risk for a range of poor health outcomes, including disturbed sleep. This risk, however, does not appear equally distributed, and some people are especially susceptible to poor outcomes following separation or divorce. The current study examines whether self-reported attachment anxiety moderates the association between objectively-measured time spent with an ex-partner and changes in objectively-measured sleep efficiency in 93 adults across a 5-month study period. We hypothesized that people high in attachment anxiety who spent more time with their ex-partner (as assessed at the first assessment) would evidence reduced sleep efficiency at the final assessment. Assessments included self-reported attachment anxiety, a seven-day assessment of sleep efficiency using actiwatches at the first and fifth months of the study, and, at the same time points, participants were also given Electronically Activated Recorder (EAR) devices to wear for the weekend. The EAR device collects ambient audio for 30 seconds every 12 minutes; this data is then coded for the time spent with an ex-partner (operationalized as the percentage of all EAR files). In prospective regression analyses controlling for Time 1 sleep efficiency and the main effects of each variable, the Time with Ex-partner X Attachment Anxiety interaction was a significant predictor of Time 5 sleep efficiency, b = -1.89, SE = .90, p = .039, 95% CI [-3.69, -.09]. As shown in Figure 1, adults high in attachment anxiety evidenced the lowest levels of sleep efficiency at the final assessment when they spent a high degree of time with their ex-partner in the months following the separation. In addition, we observed a 30-minute difference in total sleep time between participants high and low in attachment anxiety when they evidenced a high degree of contact with their ex-partner. These findings support the notion that individual differences in emotion regulatory capacities may moderate the course of health behaviors following the end of marriage and will be discussed in terms of their potential health implications.

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2) Abstract 1265

ASSESSING FUNCTIONAL ABILITY AND COGNITION THROUGH TECHNOLOGY IN OLDER HIV-INFECTED ADULTS

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Background: Neurocognitive dysfunction is found at higher rates in people living with HIV relative to their younger counterparts and non-infected individuals. This decline can impair activities that maintain independent living and successful aging. This study examined the impact of HIV on everyday task performance by obtaining information on the ability of older HIV-infected adults to perform everyday activities through the use of novel technological measures and comparing their performance to uninfected older adults.

Methods: Computer-based simulations assessing medication management (Prescription Refill Task[PRT]), financial management (ATM Task), and physician instruction comprehension (Doctor's Task) were delivered to 40 HIV-infected (27 virologically suppressed) and 28 uninfected participants (ages 50-72, mean age = 57.88 $\pm$ 5.4 years; 45.6% female, 75% Black, 11.8% Hispanic). Standard cognitive assessments and functional assessment tools were delivered (HVLT, Trail Making, Digit Symbol, and UPSA-B).

Results: Computerized task performance was compared between the two groups, which were of comparable age and education levels; Geriatric Depression Scale scores were similar. No statistical differences were observed on the ATM and PRT. Uninfected participants had a greater percentage of correct responses (p = .044) and fewer errors (p = .041) on the Doctor's Task; total task time was similar in both groups. Adjusting for age, HIV-positive participants had lower HVLT-total recall (F(2,65) = 3.68, p = .031) and HVLT-delayed recall scores (F(2,65) = 3.50, p =.036) but similar Digit Symbol Substitution and Trail Making scores. No differences were found between groups on UPSA Financial Skills, however, uninfected participants had significantly higher UPSA Communication Skills scores compared to those with HIV (F(2,65) = 6.00, p = .004).

Conclusion: Older HIV-infected people may not have difficulty with tasks requiring speed but with those relying on memory. Poorer performance on the Doctor's Task may contribute to medication non-adherence, potentially worsening the impact of HIV in non-suppressed patients. Expanding the scope of this protocol can guide development of tailored interventions to enhance effective utilization of technology to improve independence in this population.

3) Abstract 1246

IMPACT OF A PRENATAL STRESS MANAGEMENT INTERVENTION ON INFANT CORTISOL AND THE MODERATING EFFECT OF MOTHER'S PREGNANCY ANXIETY

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Altered cortisol patterns in infants, such as having a flatter cortisol diurnal slope throughout the day, have been associated with increased risk for chronic diseases later in life such as diabetes, high blood pressure, and obesity. Recent studies have shown infants' cortisol patterns to be influenced by their mother's stress levels during pregnancy. Therefore, stress management interventions for mothers are needed to test whether they may have a positive influence on infants' cortisol levels. The current study examined whether low-income mothers randomized to a cognitive behavioral stress management (CBSM) intervention during pregnancy (n=55) had infants with more normative cortisol patterns at three months postpartum compared to an attention control (AC) group (n=45) and whether these outcomes were influenced by mothers' level of pregnancy anxiety. Mothers' pregnancy anxiety (Prenatal Anxiety Scale) was assessed at baseline (~17 weeks gestation) to determine whether they were low or high in anxiety (cut-off score $\geq$17). They were then 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. A stratified randomization procedure was used to ensure approximately equal numbers of low and high pregnancy anxiety mothers in each randomization group. At three months postpartum, mothers collected two saliva samples from their infants (8am and 8pm) on one collection day. Regression analyses revealed that infants of mothers randomized to CBSM had a larger decline in cortisol throughout the day (steeper diurnal slope) compared to infants of mothers in the AC group; however, this was only true for women with low pregnancy anxiety (R^2=.07, b= 2.35, p <.04). These results suggest that prenatal CBSM interventions are potentially effective in regulating infant cortisol patterns. Further research is needed to test the short- and long-term effects of these interventions in at-risk populations of mothers and their infants.

4) Abstract 1516

PERIPHERAL NOREPINEPHRINE IN WORKING MEMORY OF PATIENTS WITH SCHIZOPHRENIA AND HEALTHY CONTROLS

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Introduction: Stress plays a major role in the risk, disease onset, and relapse of schizophrenia (SZ). Catecholamines including norepinephrine (NE), epinephrine, and particularly dopamine have been implicated in SZ. NE is known to influence cognitive processes in attention, learning, and working memory (WM), but the research regarding the impact of NE on cognition in SZ remains sparse. At moderate levels, NE is known to activate α-2A adrenoreceptors that contribute to better WM, but at elevated levels, NE activates α-1 receptors, which may result in memory impairment. However, while these effects are known to be regulated by noradrenergic neurons centrally, it is less clear whether peripheral NE may also be associated with cognitive functions. For this reason, this study examined the relationship between cumulative overnight NE levels in the urine and WM in patients with SZ and healthy controls.

Methods: Urinary catecholamines were collected overnight in patients with SZ (n=52) and healthy controls (n=35). WM was assessed using the digit sequencing task.

Results: Patients showed significantly higher average levels of overnight NE levels (33.73± 20.14 ug/24hr) compared to controls (24.55 ± 11.83, t(105) = -2.52, p = 0.013). Patients had reduced WM performance (18.02 ± 4.59) compared to controls (21.71 ± 4.49) (t(92) = 3.86, p > 0.001). There was a significant negative correlation between NE and WM in patients (r= -.39, p=0.004), but not in controls (r=.10, p=0.55). After controlling for age, sex, antipsychotic medications, and serotonin-NE reuptake inhibitor based antidepressants, the correlation remained significant (r=-0.42, p= 0.009).

Conclusions: The preliminary results suggest that the high peripheral overnight levels of urinary NE are associated with lower WM performance in patients. These results support previous studies suggesting that high levels of NE may result in impairments in WM. As NE rapidly breaks down and usually does not pass through the blood brain barrier, the potential effects of peripheral cumulative NE on WM is intriguing, and needs to be further investigated.

5) Abstract 1615

EARLY LIFE AND ADULTHOOD ADVERSITY ARE UNIQUELY ASSOCIATED WITH STRUCTURAL BRAIN AND EMOTION REGULATION ABNORMALITIES: AN INVESTIGATION USING THE STRAIN

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Introduction: Several studies have shown that early life stress predicts impairments in emotional regulation. Prolonged stress in adulthood is associated with reduced gray matter in the anterior cingulate, and prefrontal cortical regions. While lifetime adversity has been the focus of many studies, few have actually systematically assessed stress exposure occurring across the entire lifespan. We address this issue here by using the Stress and Adversity Inventory (STRAIN) to examine relations between lifetime stress exposure, structural brain imaging, and self-report indicators of emotional dysregulation.

Methods: Participants were 138 adults (M_{age}=52.5; SD_{age}=11.5) in a study of HIV (HIV+; n=90: HIV-; n=48). Study procedures included the STRAIN, neuropsychological assessment, and brain MRI. Brain regional volume and thickness were extracted using FreeSurfer from T-1 weighted images. The Behavioral Rating Inventory of Executive Functioning and the Frontal Systems Rating of Executive Functioning were used to examine domains of disinhibition, apathy, behavioral dysregulation.

Results: There were no significant differences between HIV-status groups on early life stress or adulthood stress exposure (p's > .50). Early life stress exposure was positively related to caudate volume (r=.258, p=.02), thickness of the cingulate (r=.216, p=.04), and brain stem volume (r=.238, p=.02). It was also related to self-reported problems in behavioral-emotion regulation (r=.211, p=.03). In contrast, adulthood stress was related to decreased volume of bilateral amygdala (r=-.257, p=.02) and right hippocampus (-.218, p=.013). It was also related to reports of executive dysfunction (r=.277, p=.01), behavioral-emotion regulation problems (r=.377, p=.002), apathy (r=.296, p<.001, and disinhibition (r=.360, p<.001).

Conclusion: Greater early life stress exposure, as assessed by the STRAIN, is linked to brain abnormalities in regions that are involved in emotional regulation (brain stem [arousal], cingulate [detection to error cues] and the caudate [storage and processing of past experiences to influence future actions]), in addition to problems with behavioral-emotion regulation. In addition, adulthood stress exposure was related to reduced volume of the amygdala and hippocampus, as well as impairments in a number of emotional and cognitive areas that are influenced by these regions.

6) Abstract 1802

THE QUALITY OF EARLY INFANT-CAREGIVER ATTACHMENT AND LONGITUDINAL CHANGES IN INFANT INFLAMMATION ACROSS 6 MONTHS

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Background

The quality of early caregiver-infant relationships has powerful implications for health trajectories across the lifespan, including associations with adult inflammation. However, because relatively few studies have examined this association during infancy, it remains unclear when this impact occurs and whether it is associated with longitudinal changes in inflammation during infancy.

Methods

In 45 infants, we investigated whether the quality of infant-caregiver attachment (secure vs. insecure) was associated not only with levels of salivary C-reactive protein (sCRP) cross-sectionally, but also with changes in sCRP over 6 months.

Results

Cross-Sectional Analyses: There was not a significant difference in sCRP between Secure (M = 4.71, SD = 1.02) and Insecure (M = 4.88, SD = .92) attachment classifications at 12 months of age; $t(40.64)$ = .561, p = .56. In contrast, there was a significant difference in sCRP between Secure (M = 3.56, SD = 1.35) and Insecure (M = 4.83, SD = 1.15) attachment classifications at 18 months of age, $t(39.58)$ = 3.36, p = .002.

Regression Analysis: Secure attachment when infants were 6 months of age significantly predicted decreasing levels of sCRP across 6 months, β = -1.40, SE = .36, p < .001, and explained 38% of the variance in sCRP change scores.

Discussion

Interestingly, while there were no cross-sectional associations between infant-caregiver attachment and inflammation at 12 months of age, infant-caregiver attachment security predicted lower levels of sCRP 6 months later. In addition, infant-caregiver attachment security predicted decreasing levels of sCRP across those 6 months. Implications for understanding the influence of the quality of early relationships on biological mechanisms related to disease are discussed.

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7) Abstract 1637

RISK MECHANISMS LINKING STRESS EXPOSURES AND PHYSICAL HEALTH OUTCOMES IN MALE AND FEMALE POST-9/11 VETERANS: EXAMINING THE ROLE OF PTSD AND DEPRESSION SYMPTOM SEVERITY

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Background: Trauma exposure and its mental health correlates can have negative implications for health, particularly in high-risk populations, such as military and veteran groups. However, there are a number of factors that can increase or decrease health risk in the wake of stress, including mental health symptomatology, such as PTSD and depression. This longitudinal study examined risk associations linking both potentially traumatic military stressors (warfare exposure, sexual harassment, and nuclear, biological, and chemical [NBC) exposures) as well as prior lifetime stressors with indicators of post-military physical health (health functioning, BMI, and physical activity), with a focus on the potential mediating roles of PTSD and depression symptom severity as well as gender differences.

Methods: Participants included 522 post-9/11 veterans (54% female) who were assessed within two years of return from deployment to Afghanistan or Iraq (T1), and then again 3.5 years (T2) and 1.5 years (T3) later. A mail survey was administered at all 3 timepoints. The DRRI-2 was administered to assess deployment stress exposures at T1. Mental health symptoms and indicators of physical health functioning and quality of life were assessed at follow-up timepoints. Specifically, PTSD was assessed using the PCL-5, depression symptoms were assessed using an adapted version of the BDI-PC, physical health functioning was assessed using the SF-12, and BMI and physical activity were measured by self-reported height and weight and average number of days of exercise per week, respectively. Associations were examined using gender-stratified structural equation models (SEM).

Results: SEM analyses revealed common direct pathways for women and men, including associations linking prior life (pre-military), warfare, and NBC exposures with subsequent health functioning. A number of overlapping and gender-specific indirect effects were found for functioning, BMI, and physical activity. Overall, PTSD was found to be a key mediator for men and women, and depression played a role as well, particularly for women.

Conclusions: Results suggest that stress exposures prior to and during military service are associated with reduced health-related functioning and quality of life in the years following military service, and that mental health symptoms play an important role in these associations.

8) Abstract 1557

CHILDHOOD TRAUMA AND HEART RATE REACTIVITY IN RESPONSE TO PSYCHOLOGICAL AND PHYSICAL STRESS.

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Background: Early life trauma has been associated with blunted heart rate (HR) reactivity to acute psychological stress. In turn, blunted cardiac reactivity associates with adverse behavioral and health-relevant outcomes. It remains unknown if the association is specific to certain types of trauma (e.g., physical, emotional) or whether the association is also present with physical stress tasks (e.g., cold pressor).

Aim: To 1) examine the relationship between childhood trauma and HR reactivity to both a psychological and physical stress task and 2) determine if the relationship is specific to certain types of trauma.

Methods:72 participants (age range 18-65) were asked to complete the Adverse Childhood Experiences (ACE), Childhood Trauma Questionnaire (CTQ), and Risky Families Questionnaire (RFQ) as measures of childhood trauma. Participants completed a validated psychological stressor, the Paced Auditory Serial Addition Test (PASAT) and a validated physical stressor, the Cold Pressor (CP) task during a laboratory visit. HR was collected before and during the PASAT and CP task. A reactivity score was calculated as the difference between average HR during the respective task and average HR at baseline of that task.

Results: Independent of age, gender, and race, individuals who reported more trauma as measured by the ACE, and the RFQ, exhibited blunted HR reactivity in response to PASAT (β= -.34 t(67)= -2.85, p= .01 and β= -.27, t(67) = -.2.27, p< .05 respectively), but not in response to the CP (β=-.10, t(64)=-.77, p=.44 and β=-.04,t(64)=-.36, p=.72 respectively). The CTQ indicated that the relationship between childhood trauma and HR reactivity to the PASAT is specific to physical abuse during childhood (β= -.29, t(67)= -2.30, p< .05). Physical abuse in childhood did not associate with HR reactivity in response to the CP (β=-.18,t(64)=-1.49, p=.14).

Conclusions: These results add to an existing literature indicating an association between childhood trauma and blunted cardiac responses to acute psychological stressors. Our findings suggest that this relationship may be unique to psychological stressors. The age variability in our sample is broad (18-65), which suggests that these relationships may be observed across the lifespan. Future research is needed to better understand the psychological mechanisms that may account for the observed relationship.

9) Abstract 1152

POSITIVE AFFECT AND PERIPHERAL INFLAMMATION: A REVIEW

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Background: Research examining positive affect (PA) and objective indicators of health suggests that PA may promote health and longevity. Multiple studies suggest that inflammation may serve as one potential mechanism linking PA and health. However, it remains unclear to what extent PA and specific aspects of PA are consistently associated with inflammatory markers. Further, it is unclear whether observed associations are more in keeping with the possibility that there are relatively direct effects of PA on markers of inflammation or with the perspective that PA operates as a buffer of the effects of stress. **Methods:** The present review incorporates studies that have examined the association between PA and inflammatory markers obtained via peripheral circulating blood (including via blood spot). Twenty-seven studies (14 cross-sectional, three longitudinal, and 10 experimental) met inclusion criteria. Results were examined by whether PA was retrospective (recalled PA over several days) or recent (daily or momentary PA), by study design (cross-sectional, longitudinal, and experimental), and by type of inflammatory marker (e.g., proinflammatory, anti-inflammatory). **Results:** Recent PA was more consistently associated with inflammatory markers compared to retrospective PA. Studies using a cross-sectional design with retrospective PA were particularly unlikely to report significant associations with inflammatory markers; one important caveat was that higher retrospective PA and recent PA were both consistently associated with lower CRP, regardless of study design. Reviewed studies generally suggested that higher PA was associated with lower proinflammatory markers; studies with anti-inflammatory markers were less consistent. In general, there was more support for evidence of stress buffering as opposed to a relatively direct association between PA and inflammation. **Discussion:** Recommendations for the field and future research are discussed, including the importance of taking into consideration the timing between PA and inflammatory marker

assessments and the value of utilizing recent PA measures that are temporally and contextually linked with inflammatory markers. Limitations of the existing literature include a lack of differentiation of PA by level of arousal, which previous research suggests may have important implications for how PA relates to health.

10) Abstract 1766

HEALTHY ADULTS WITH HIGHER LEVELS OF CHILDHOOD TRAUMA MOUNT A LESS ROBUST IMMUNE RESPONSE TO A TYPHOID ENDOTOXIN VACCINATION

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Background

Adults with a history of childhood maltreatment have been shown to have higher basal levels of inflammatory markers, including C-reactive protein (CRP) and tumor necrosis factor-alpha (TNF-α). Moreover, when faced with an acute psychological stressor, healthy adults with a history of childhood abuse show increased inflammatory responses, but diminished activation of the hypothalamic-pituitary adrenal axis. Little is known about how adults with childhood trauma respond to an acute inflammatory challenge in the form of a vaccine.

Methods

24 healthy adult men were recruited for this pilot study (mean age = 38, range 20-60). Subjects were given baseline questionnaires, including the Childhood Trauma Questionnaire (CTQ). 12 subjects were randomized to receive the polysaccharide form of the typhoid vaccination and 12 received a placebo. Complete blood count with differential (CBC) and high-sensitive C-reactive protein (hsCRP) were assessed prior to vaccine (T1), at two hours after vaccine (T2) and at four and a half hours after vaccine (T3).

Results

Subjects with more childhood trauma (CTQ range within experimental group = 37-55) showed reduced immune response to endotoxin, evidenced by a significantly reduced increase in platelets (r=-.665, p=.036). Within specific types of childhood trauma, increases in platelets were significantly lower in those with higher levels of physical abuse (r=-.698, p=.036) and sexual abuse (r=-.728, p=.026), controlling for age. Although there was no association between total childhood abuse and hsCRP, there was a reduced hsCRP response to vaccine in individuals with higher levels of childhood physical abuse (r=-.559, p=.059) and sexual abuse (r= -.558, p=.059).

Conclusions

We found that subjects with more childhood trauma mounted a lesser immune response to the typhoid endotoxin vaccination, evidenced by reduced increases in platelets and hsCRP, compared to subjects with less childhood trauma. This effect was particularly driven by higher levels of sexual and physical abuse. Platelet count, as an acute phase reactant, is expected to increase in response to inflammatory conditions, such as a vaccination. Subjects with a history of childhood trauma did not show this expected immune response. Further research is needed to clarify how the relationship between immune system dysfunction and childhood trauma.

11) Abstract 1710

ASSOCIATIONS OF EARLY LIFE ADVERSITY AND CURRENT PERCEIVED STRESS ON GUT MICROBIAL ARCHITECTURE AND METABOLITES IN IBS PATIENTS AND HEALTHY CONTROLS

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Background: The microbiome is shaped during the first 3 years of life, and adversities during development have been implicated in later gut dysfunction. In the adult, the microbiome plays a key role in immune, neural and gut functions. Gut microbes and metabolites are sensitive to psychosocial stress, and chronic stress-induced alterations in tryptophan metabolites has been described in rodents. We hypothesize that early life adversity and current perceived stress are associated with altered gut tryptophan metabolites in adult subjects.

Methods: Stool samples were collected from 92 IBS patients (25M, 67F) and 66 healthy controls (30M, 36F) and analyzed for TRP metabolites. Participants completed questionnaires to assess early life adversity (Adverse Childhood Experience Questionnaire [ACE] and Early Trauma Inventory [ETI]) and current stress (Perceived Stress Scale [PSS]). Linear regressions were run in SPSS.

Results: Indole levels showed interactions between current stress and early sexual abuse (as measured by ACE, p=0.021; and ETI, p = 0.042). Indole-3-acetamide levels showed main effects of physical abuse (p=0.001) and interactions between current stress and physical (p=0.00009) and emotional abuse (p=0.047). Indoleacetate levels showed main effects of physical abuse (p=0.003) and interactions between current stress and physical abuse (p=0.000325). Similar, but less significant interactions were observed for Indoleacetylaspartate and Indoeacetate. For the majority of these indole metabolites, interactions showed that with low early adversity, metabolite levels are unrelated to current perceived stress (or slightly positively related), but that with high early adversity, metabolite levels are strongly positively related to current stress. In contrast, Indolelactate was negatively related to current stress at low levels of early life adversity.

Conclusions: In a mixed sample, a history of early adversity differentially moderates the relationship between current stress and adult gut metabolite levels. These findings emphasize the crucial role of early adversity both on perceived stress and gut microbial function. The fact that the early adverse events were experienced after the 3 year programming phase of the gut microbiome suggests that the observed metabolite changes are secondary to increased stress responsiveness resulting from early adversity.

12) Abstract 1617

MINDFULNESS-BASED STRESS REDUCTION DECREASES STRESS REACTIVITY AND INCREASES PAIN TOLERANCE IN WOMEN WITH EARLY LIFE ABUSE: A RANDOMIZED CONTROLLED TRIAL

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Background: Early life abuse (ELA) may initiate pathophysiological cascades resulting in long-term maladaptive stress reactivity, elevated pain sensitivity (hyperalgesia) and an increased risk for psychopathology. Experimental evidence suggests that mindfulness-based stress reduction (MBSR) is effective in modifying stress reactivity and pain tolerance, thus, we predicted that MBSR would be particularly efficacious in altering stress regulation and sensitivity to noxious stimuli in women with ELA.

Method: Medically healthy women ages 18-52 (mean=33.1) with or without a history of early (<16 years) physical or sexual abuse were randomized (stratified on ELA) to standard MBSR (n=79) or social support (n=82) for 8 weeks. Hypothalamic pituitary adrenal (HPA) reactivity to a psychosocial stress task (Trier Social Stress Test, cortisol) and pain sensitivity to a noxious stimulus (cold pressor pain tolerance, seconds) were evaluated pre and post intervention using repeated measures ANOVA for Time(2) X Intervention(2) X Abuse(2). Women were tested in the luteal phase to control for potential menstrual cycle effects on stress reactivity.

Results: A significant Time X Abuse X Intervention interaction for cold pressor pain tolerance (recent stressful life events as a covariate) [$F(1,75)=4.6$,p=.035] indicated that women with ELA had lower pain tolerance at both time points relative to women with no ELA; however, the MBSR intervention was more effective at increasing pain tolerance for women with ELA than the social support intervention. For women without ELA, the interventions had differential effects, with MBSR reducing and social support increasing pain tolerance. A Time X Abuse X Group interaction [$F(1,88)=11.5$,p=.001] for cortisol (area under the curve) revealed that MBSR reduced cortisol reactivity in women with ELA, yet increased cortisol reactivity in women without ELA.

Conclusions: As predicted, MBSR appears to have differentially greater benefit for pain sensitivity and cortisol stress reactivity for women with ELA, and may be an effective and low risk approach for managing somatic symptoms and stress regulation in women with ELA. In contrast, those without ELA showed a MBSR-related decrease in pain tolerance. While speculative, the MBSR focus on increasing awareness of momentary experiences may have contributed to enhancing pain perception in those without ELA.

13) Abstract 1249

INDIRECT NEIGHBORHOOD VIOLENCE EXPOSURE PREDICTS MULTIPLE BIOMARKERS OF HEALTH AMONG ADOLESCENTS LIVING IN CHICAGO AREA

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Background: Violence exposure in early life is associated with physical health problems across the lifespan. Prior research has focused primarily on direct violence (victimization or witnessing) and self-reported health. Enduring questions remain about 1) whether indirect violence exposure affects health and if so 2) the specific biological processes involved. This study extends prior work by testing whether direct violence and neighborhood violence are uniquely associated with biological processes known to underlie chronic disease pathogenesis, including metabolic syndrome, low-grade inflammation, and the monocyte subtypes that contribute to it (e.g., counts of classical and non-classical cells).

Methods: 277 eighth grade students from the greater Chicago area had a fasting morning blood sample drawn. Cytokines (IL-6, IL-8, IL-10, TNFα) and C-reactive protein were measured and aggregated to form a composite of low-grade inflammation. Populations of classical (CD14++/CD16-) and non-classical (CD14+/CD16++) monocytes were enumerated by flow cytometry. Fasting glucose, lipids, triglycerides, resting blood pressure, and waist circumference were aggregated to form a count score of metabolic syndrome signs. Participants reported on direct violence exposure and indirect exposure to neighborhood violence was measured by linking participants' home addresses to federal data on murder rates aggregated at the block-group. We used generalized estimating equations to model the effects and account for the data's nested structure (Table 1). Covariates included age, sex, race, ethnicity, pubertal status, and socioeconomic status.

Results and conclusions: Neighborhood violence was positively associated with metabolic syndrome (Model 1: Exp$B$=1.08, p<0.05), classical monocyte count (Model 2: B=3.87, p<0.05), inflammation at trend-level (Model 4: B=0.03, p<0.10), but not with non-classical monocytes (Model 3). Direct violence exposure was not associated with any biomarkers. Figure 1 depicts the associations between neighborhood violence and metabolic syndrome and classical monocytes. Findings suggest that indirect neighborhood violence exposure during adolescence may shape biological factors known to promote disease.

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14) Abstract 1826

GUT MICROBIOME DIFFERENCES IN TWIN PAIRS DISCORDANT FOR LIFETIME HISTORY OF MAJOR DEPRESSIVE DISORDER

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Major depressive disorder (MDD) is a disorder that affects approximately 350 million people worldwide. Twin and family studies have revealed that both genetic and environmental factors, as well as their interactions, contribute to MDD. A compelling body of evidence suggests that the gut-brain axis (GBA) plays an important role in maintaining homeostasis of the central nervous system. The GBA is a dynamic matrix of tissues and organs including the brain, glands, gut, immune cells, and gastrointestinal microbiota that communicate in a multidirectional manner to maintain homeostasis. Gut dysbiosis can lead to a broad spectrum of physiological and behavioral effects including altered activity of neurotransmitter systems and immune function. Indeed, both human and animal studies have shown that microbiome diversity is associated with depression-like behaviors. While these studies demonstrate the potential importance of gut dysbiosis in MDD, results from previous studies are mixed, likely due to confounding by unknown or unmeasured factors such as genetics, in utero environment, and early familial environment. A well-matched co-twin control design provides an ideal context for studying the role of the gut microbiome in MDD. As a late-breaking abstract we propose to report findings from our co-twin control study in which we recruited 79 monozygotic (MZ) and 17 dizygotic (DZ) twin pairs from the community-based Washington State Twin Registry who were discordant for lifetime history of MDD to examine factors in depression including DNA methylation and gut microbiome diversity. Gut microbiome profiles from self-collected stool samples will be assessed by 16S rRNA sequencing of the V4 hypervariable region. Preliminary results from 37 MZ pairs (N = 74, mean age = 38.2 years, 68.4% female) suggest differences in phylogenetic diversity such that depressed twins have lower gut microbiome diversity measured as Simpson index and Shannon index compared to their non-depressed co-twins. We plan to complete 16S rRNA assays and analysis by February 2019 on all usable samples from the MZ and DZ twins. Results will be reported in terms of both phylogenetic diversity and differences in specific genera controlling for age, gender, education level, income level, early life stress, diet, and self-reported use of antidepressants.

15) Abstract 1256

INSOMNIA SYMPTOMS DURING PREGNANCY: A META-ANALYSIS

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Background: A number of biological and psychological factors contribute to changes in sleep quality and maintenance during pregnancy, and the prenatal period may constitute a time of increased risk for the development of insomnia. Currently, estimates of insomnia prevalence during pregnancy vary widely. The goal of the current study was to meta-analyze a prevalence of insomnia during pregnancy and to explore potential moderators (trimester, maternal age, and symptoms of anxiety and depression). Method: We conducted a systematic search of PubMed, PsycInfo, and Web of Science from inception to July 2018 using the terms "pregnancy" AND "insomnia". In total, 14 studies with a total of 8,606 participants were included in the analysis. Data from each article was extracted by two authors into a standardized worksheet and included the prevalence of insomnia, trimester/ average gestational age, average maternal age, depression prevalence of the sample, and anxiety prevalence of the sample. We conducted a series of random-effects meta-analyses to determine an overall insomnia prevalence as well as a prevalence for each trimester. Additionally, we used Duval's and Tweedie's procedure to adjust for bias and conducted sensitivity analyses to test the stability of our overall insomnia prevalence estimate. Finally, we conducted sub-group and meta-regression analyses to test the effects of our moderators. Results: The overall prevalence of insomnia during pregnancy was 36.7%. Some bias was present and after an adjustment using Duval's and Tweedie's procedure, our estimate was attenuated to 34.8%. Sensitivity analyses indicated that the estimate was stable. Trimester was a significant moderator of prevalence such that insomnia prevalence increased from second to third trimester (18.9% vs 39.4 %). No other variables significantly moderated insomnia

prevalence. Conclusion: The results of the current meta-analysis suggest that insomnia prevalence is elevated during pregnancy, particularly in the third trimester. Future research should examine the efficacy and safety of insomnia treatments with this population.

16) Abstract 1492

IS CHILD HEART RATE VARIABILITY REACTIVITY A PROTECTIVE FACTOR BUFFERING THE RISK OF MATERNAL EMOTION DYSREGULATION AND CHILD BEHAVIOR PROBLEMS?

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Maternal emotion dysregulation, a transdiagnostic feature of psychopathology, may be a potential risk factor for the emergence of psychopathology in children. However, there is less known about child characteristics that might serve as protective factors against this risk. One such characteristic is heart rate variability (HRV) reactivity, where greater decreases in HRV from baseline to a stressor task indicate increased emotion regulation. This study examined whether increased child HRV reactivity served as a protective factor mitigating the transmission of psychopathology from emotionally dysregulated mothers to behavior problems in preschool age children.

Mother-preschooler dyads (N=66) were oversampled for maternal emotion dysregulation, measured using maternal self-report on the Difficulties in Emotion Regulation Scale. Mothers reported on child internalizing and externalizing behaviors using the Child Behavioral Checklist. Child baseline HRV was collected, where the child sat quietly for 2 minutes while a book was read to them. Child HRV was also measured during a stressor task, where dyads had 7 minutes to build a complex Lego figure. HRV reactivity was calculated by subtracting child baseline HRV from child HRV during the stressor task.

Two hierarchical regression models were conducted, entering maternal emotion dysregulation, child HRV reactivity, and the interaction term of these variables predicting either child internalizing or child externalizing problems (see Tables 1 and 2). Across these two models, maternal emotion dysregulation, but not child HRV reactivity, significantly predicted child's internalizing and externalizing behaviors. Maternal emotion dysregulation significantly interacted with child HRV reactivity to predict child internalizing behaviors, such that maternal emotion dysregulation had a greater impact on child internalizing behaviors if the child exhibited a greater decrease in HRV from baseline to the stressor task (i.e. exhibited increased self-regulation). There was no significant interaction predicting child externalizing behaviors.

These findings suggest that maternal emotion dysregulation more strongly predicts child behavior problems in physiologically regulated children. Interventions that target maternal emotion dysregulation may therefore improve child behavior outcomes even in physiologically regulated children.

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17) Abstract 1689

METABOLIC SYNDROME MODERATES THE ASSOCIATION BETWEEN EXECUTIVE FUNCTION AND FUNCTIONAL CONNECTIVITY IN THE DEFAULT MODE NETWORK

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Metabolic Syndrome identifies a cluster of risk factors associated with cardiovascular morbidity and mortality as well as diminished cognitive function. In this study, we examined the link between MetS, resting state functional connectivity in the Default Mode Network and current executive functioning in middle aged adults. DMN functional connectivity was chosen as a measure of brain integrity as desynchronization at rest has been shown to relate to poorer cognitive performance. Executive dysfunction and neuropathological changes in their corresponding brain regions have emerged as some of the earliest markers of neurological deficits and frontal lobe regions are particularly vulnerable to the effects of cardiovascular disease. Our study sample included 197 native English speakers between the ages of 40 and 60, free of neurological or psychiatric disorders.Executive function was assessed with the Stroop, Digit Span, and Trails subtests.The presence of MetS was evaluated during a health assessment, based on the International Diabetes Federation criteria. Imaging was conducted using a 3T Siemens Skyra scanner equipped with a standard head coil. Seed-based Correlation Analyses were performed by examining functional connectivity in the resting state between the seed voxel, placed in the PCC, and the medial prefrontal cortex, the two primary nodes of the DMN. Using the MODPROBE macro for SPSS and controlling for age and education, the impact of the moderator variable, number of MetS components, on the relationship and executive function scores was assessed. The interaction between connectivity and MetS components was significant (t=-2.347, p=.02). In individuals with lower numbers of MetS components, increased functional connectivity predicted higher scores on tests of executive function. Individuals with higher numbers of MetS components did not benefit from increased connectivity on executive function assessments and results suggested a disadvantage of increased connectivity in this group.Our finding supports previous findings that high default mode network connectivity is positively correlated with cognitive performance in some instances, i.e. those with lower numbers of MetS components; however, it highlights the need to continue investigating how individuals at midlife may be using compensatory mechanisms to mask vulnerability to later cognitive decline.

18) Abstract 1048

THE STRESS-INDUCED EATING HYPOTHESIS: MEDIATION OF THE RELATIONSHIP BETWEEN PERCEIVED STRESS AND HUNGER BY EMOTIONAL AND RESTRAINED EATING STYLES

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Introduction: The stress-induced eating hypothesis suggests that subjective feelings of hunger are facilitated by elevated hostile negative affect (HNA) and perceived stress (PS). Evidence suggests that persons who tend to eat in response to emotional cues (EMO) and/or who are restricting food intake (RES) may be more adversely affected by PS. Although research has linked HNA with PS, and PS with eating style tendencies, it is unclear how strongly associated these factors are to fluctuations in hunger that occur across the day. The present study examined perceived hunger across 2 successive in-patient days, with 5 meals administered every 3.5 hrs/day. Study aims examined whether: 1) PS mediates the HNA-hunger relationship; and 2) EMO and RES eating styles mediate the PS-hunger relationship.

Methods: Of the 143 healthy adults (35% women, 18-55 years), none had prior cardiometabolic or psychiatric conditions. Hunger was rated preceding each meal. HNA was indexed by Cook-Medley Hostility Inventory and Profile of Mood States subscales. PS was indexed from the Perceived Stress Scale total score. EMO and RES eating factors were derived from the Dutch Eating Behavior Questionnaire, Three-Factor Eating Questionnaire, and Restraint Scale. Aims were assessed using SEM, controlling for age, sex and waist girth.

Results: Paths from HNA to PS (β=.55, p<.001), and from PS to EMO (β=.16, p<.05) and to RES (β=.25, p<.009) were found. A path from RES to EMO was also shown (β=.53, p<.001). The path from EMO to Hunger was positively related (β=.35, p<.03), whereas the path from RES to Hunger was inversely related (β=-.42, p<.007). The final model (χ^2=134, p=.13) had good fit (CFI=.98, RMSEA=.03). Thus, with elevated HNA and PS, there was increased EMO eating and increased reported hunger. The path from HNA and PS also lead to greater RES eating. With greater RES eating there was a direct path to reduced hunger, but also an indirect path to greater hunger via increased EMO eating.

Conclusion: Therefore, both EMO and RES eating mediate the linkage of stress with perceived hunger, independent of age, sex and central adiposity. Successful restriction of caloric intake may explain the divergence in the direction of the association of RES eating with hunger. Future research is needed to determine whether EMO and unsuccessful RES eating are paths reflecting greater cardiometabolic risk.

19) Abstract 1653

SELF-CONTROL AS A PREDICTOR OF PHYSIOLOGICAL REACTIVITY TO ACUTE STRESSORS

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Background: Self-control is the belief that one has the ability to control their thoughts, feelings, and behaviors. Greater self-control has been linked to less-pronounced reactions to adverse events, particularly lower post-stressor rumination, alcohol use, as well as symptoms of chronic and post-traumatic stress. Little is known about whether overall self-control and its subcomponents (e.g., emotion vs. cognition control) predict more adaptive physiological stress responses.

Objective: To evaluate the associations of perceived self-control with cortisol and autonomic reactivity to acute laboratory stressors in a large sample of midlife and older adults.

Methods: Data came from the Biomarker Project of the Midlife in the United States II Study. A sample of 886 participants ages 35 – 85 completed a questionnaire that assessed self-control in the domains of emotion, cognition, and burden consciousness (i.e., behaving in such a way as to not impose burden on others), and then participated in two cognitive stress tasks (Stroop and mental arithmetic). Salivary cortisol and high frequency heart rate variability (HF-HRV) were collected pre- and post-stressor exposure.

Results: Findings from regression models indicated that perceived self-control predicted physiological stress reactivity. Specifically, people higher in self-control showed lower salivary cortisol reactivity to the acute stress tasks (B = -1.157; 95% CI = -1.951, -.363; $p < .01$), adjusting for baseline cortisol levels, demographics, and socioeconomic status. Higher self-control was also marginally predictive of less-decreased HF- HRV in reaction to stressors (B= .109; 95% CI = -.008, .227; $p < .1$). In analyses examining the sub-components of self-control, the emotion control subscale was associated with less salivary cortisol (B = -.893; 95% CI = -1.513, -.273; $p < .01$) and HF-HRV (B = .10; 95% CI = .008, .191; $p < .05$) stress reactivity, respectively, whereas the cognition and burden consciousness subscales were not predictive of stress reactivity.

Conclusion: Our findings demonstrate that individual differences in self-control predicted cortisol and autonomic reactivity to acute stressors. Most notably, control over one's emotions may be particularly important for protecting against pronounced reactivity when encountering a stressors.

20) Abstract 1748

DEVELOPMENT AND VALIDATION OF A DISCRIMINATION REACTIVITY QUESTIONNAIRE

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Background: Previous research shows stress contributes to disease progression. However, not all individuals who experience stress go on to develop disease. Stress reactivity is a mediator of the relationship between stress and disease progression. Similarly, stress from discrimination is related to negative health outcomes. While extant questionnaire scales focus on measuring a single type (i.e. race, sexual orientation) and the frequency of discriminatory events, the current study moves beyond these limitations. The main aims of the study were: (1) Develop a scale that measures different dimensions of reactivity to discrimination, (2) Determine whether the overall scale predicts depressive and physical symptoms above and beyond previous discrimination scales.

Methods: Participants (N = 433) completed the new Discrimination Reactivity Scale (DRQ) as well as other questionnaires assessing discrimination, depression and physical symptoms. An exploratory factor analysis was conducted to determine the underlying dimensions of the DRQ. Secondly, a hierarchical regression was conducted with the Krieger Experience of Discrimination scale (EOD) and the experience of day-to-day unfair treatment entered together in step one and the DRQ entered into the model in step two.

Results: Six factors were retained from the factor analysis reflecteding perseverative cognition, anxiety, heightened vigilance, psychophysiological response perception, and in-group perception. The overall DRQ was correlated with the EOD, $r = .30$, n = 425, $p < .001$, and day-to-day unfair treatment, $r = .38$, n = 426, $p < .001$. Regression analysis revealed the DRQ predicted depressive symptoms, above and beyond the EOD and day-to-day unfair treatment, $b = .15$, $ß = .24$, $SE = .03$, $t(420) = 4.82$, $p < .001$; and uniquely explained 5% of the variability in depressive symptoms, $\Delta R2 = .05$, $F(1, 420) = 23.22$, $p < .001$. The DRQ predicted physical symptoms above and beyond the EOD and day-to-day unfair treatment, $b = .38$, $ß = .12$, $SE = .16$, $t(417) = 2.36$, $p = .02$; and uniquely accounted for 1% of the variability in physical symptoms, $\Delta R2 = .01$, $F(1, 417) = 5.57$, $p = .02$.

Conclusion: The present study indicates the DRQ may be a useful new tool that predicts health related outcomes, above and beyond previous measures of discrimination. Future studies will incorporate objective physiological response to discrimation stress.

21) Abstract 1665

INTERACTIVE EFFECTS OF PARTNER DOMINANCE AND HOSTILITY ON CARDIOVASCULAR REACTIVITY DURING SOCIAL INTERACTIONS

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Many aspects of interpersonal functioning predict future risk of cardiovascular disease (CVD), and cardiovascular reactivity (CVR) is a potential mechanism underlying such associations. Exposure to hostile and dominant behavior by others evokes greater CVR (Smith, Cundiff, & Uchino, 2012), but no study to our knowledge has specifically examined the interactive effects of these social stimuli on CVR. The present study examined the effects of an interaction partner's dominance and hostility on blood pressure and heart rate reactivity. Participants included 105 undergraduates (64 women) who engaged in a video-linked interaction with a pre-recorded confederate partner in 1 of 4 randomly-assigned conditions in a 2 (high/low Dominance: dominant vs. submissive) x 2 (high/low Hostility: hostile vs friendly) factorial design. As expected, using interpersonal circumplex-based assessments, participants rated the confederate in the high Hostility conditions as significantly more hostile than in the low Hostility conditions, $F(1, 92) = 148.9$, $p < .001$, $\eta_p^2 = .62$, and they rated the confederate in the high Dominance conditions as significantly more dominant, $F(1, 92) = 186.3$, $p < .001$, $\eta_p^2 = .67$, confirming the effectiveness of the manipulations. Interacting with a high Dominance confederate also evoked larger increases in state anxiety, $F(1, 92) = 3.9$, $p = .05$, $\eta_p^2 = .04$, and anger, $F(1, 92) = 7.2$, $p = .009$, $\eta_p^2 = .07$. High Hostility confederates also evoked larger increases in state anger, $F(1, 92) = 27.5$, $p < .001$, $\eta_p^2 = .23$. In analyses of CVR (using baseline values as a covariate), the Dominance x Hostility interaction approached significance for systolic blood pressure, $F(1, 96) = 3.41$, $p = .063$, $\eta_p^2 = .03$, and was significant for heart rate, $F(1, 96) = 4.83$, $p = .03$, $\eta_p^2 = .05$. For both measures, interacting with a confederate who was both dominant and hostile produced significantly greater CVR than interactions with dominant-friendly and hostile-submissive confederates (*M* SBP: DH = 124.9mmHg, DF = 121.5mmHg, HS = 120.3mmHg; *M* HR: DH = 93.5bpm, DF = 85.3bpm, HS = 83.2bpm). These results suggest that exposure to the combination of dominance and hostility during social interactions can have a disproportionate

influence on CVR, and if such exposures are sufficiently frequent perhaps confer a greater risk of CVD.

22) Abstract 1683

SLEEP AS A MEDIATOR OF RACIAL DIFFERENCES IN DIURNAL CORTISOL SLOPE

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African Americans (AAs) are at greater risk of premature mortality than their European American (EA) counterparts, and many studies reveal race differences in diurnal cortisol secretion, an indicator of HPA-axis functioning, as well. AAs tend to have flatter slopes than EAs; such indices are associated with increased morbidity and mortality risk. Mechanisms accounting for this are not fully understood. Recent findings from this lab (Peterson, et al., 2017) suggest that race differences in cortisol slope may be partially attributed to race differences in nightly sleep duration. In this report, we seek to replicate this finding in an independent sample of 312 middle-aged adults.

Participants included 312 AA and EA adults (mean age = 52.8 years, 78% EA, 28% male) with no history of cardiovascular disease (SHINE cohort, Univ of Pittsburgh). Slope measures were derived from salivary cortisol assessments collected 5 times a day for 4 days. Accelerometry-based assessments of physical activity (Sensewear arm band) and sleep (Actiwatch) were also collected, along with demographic characteristics.

Daily diurnal cortisol slope was calculated using within-subject regression; resulting scores were averaged across days. Two sets of regression models included covariates for 1) demographic factors (age, sex, income, education), and 2) health behaviors (alcohol use, smoking status, physical activity, sleep). In both models, race emerged as a significant predictor of cortisol slope. With all covariates accounted for, race ($F = 17.00$, $p < .001$) along with sleep duration ($F = 9.86$, $p < .01$) predicted slope. Mediation analysis showed that sleep duration partially accounted for the association between race and cortisol slope (B = 0.0029, 95% CI: 0.00019, 0.0067), consistent with the previously reported results. Race ($F = 9.62$, $p < .01$), but not sleep duration, predicted cortisol area under the curve (AUC). Race and sleep duration were not associated with cortisol awakening response (CAR).

Race differences in diurnal cortisol slope may be partly accounted for by differences in nightly sleep duration, an effect now shown in 2 independent samples. These results point to a potential mechanism linking race differences with premature mortality, and they have implications for the development of interventions by which racial health disparities may be reduced. Supported by NIA R01AG041778.

23) Abstract 1230

PREDICTING AMBULATORY BLOOD PRESSURE IN EVERYDAY LIFE: COMPARING THE EFFECTS OF STATE AND TRAIT ANXIETY AND SADNESS

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Evidence suggests that those who experience negative emotions have worse cardiovascular health. Yet, much of this work has been done with retrospective surveys or in experimental contexts, thus limiting our understanding of the in-the-moment influence of negative emotions on cardiovascular functioning while people are in ecologically valid environments. More so, direct comparisons of negative emotions that differ in arousal – anxiety and sadness – have been rare, despite work suggesting that negative arousal emotions may drive much cardiovascular responding. This study investigated the associations between anxiety (high arousal) and sadness (low arousal) and ambulatory blood pressure (ABP) in different ways - within person via ecological momentary assessment (EMA), and between-person as both an averaged EMA and trait assessment. The sample comprised 282 participants recruited from the New York City area (53.2% female;$M \pm SD_{age} = 39.3 \pm 11.2$; 56.6% Black; 34.4% hypertensive). The Taylor Manifest Anxiety Scale (TMAS; Taylor, 1953) and the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) measured anxiety and depression traits. SpaceLabs ABP monitors were used to collect up to 40 ABP readings over multiple 24-hour periods. Momentary anxiety and sadness were assessed via EMA, with up to 40 assessments per each participant. These assessments were averaged for each person to have an additional between-person assessment of sadness and anxiety. Multilevel mixed-effects models revealed that momentary anxiety and averaged EMA anxiety were the most consistent predictors ABP while trait anxiety measures was a poor predictor across all models. Sadness was not a significant predictor of ABP. Results suggest that anxiety should be given attention as a potential risk factor for hypertension. Findings also highlight a unique perspective of the within-person level in understanding the dynamic relationship between emotions and physiology.

24) Abstract 1370

AN EXPLORATION OF THE DYNAMIC RELATIONSHIP BETWEEN SELF-REPORTED PSYCHOLOGICAL DISTRESS AND SOMATIC SYMPTOMS IN STRESS-RELATED DISORDERS.

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Background: The experience of various somatic symptoms is very common in patients with stress-related disorders, although the direction of this relationship is not always clear. The goals of the current study were 1) to investigate the direction of the relationship between self-reported psychological distress and somatic symptoms over time in a heterogeneous group of patients with stress-related disorders and 2) to investigate inter-individual differences in the relationship between psychological distress and somatic symptoms in the same group.

Methods: Hundred patients with heterogeneous stress-related diagnoses filled out a self-observation form enquiring levels of psychological distress and somatic symptoms for every hour on seven consecutive days. Further, all patients filled out a battery of questionnaires measuring personality and early adverse experiences. The largest diagnostic groups were panic disorder (n = 28), overstrain (n = 32) and bodily distress syndrome (n = 23). Other diagnoses included obsessive-compulsive disorder, post-traumatic stress disorder, burnout and specific phobias.

Results: A cross-lagged analysis, controlling for stabilities over time and within-time correlations, revealed that average psychological distress on day N predicted average somatic symptoms on day N +1 ($p = 0.003$) but not vice versa ($p = 0.25$). A within-subject correlation between self-reported psychological distress and somatic symptoms was calculated using all data points to investigate inter-individual differences in the relationship between psychological distress and somatic symptoms. The within-subject correlation did not differ significantly between the three largest patient groups. However, the number of early adverse experiences negatively correlated with the strength of the relationship between psychological distress and somatic symptoms ($p = 0.036$). The within-subject correlation was not correlated with negative and positive affectivity or alexithymia.

Conclusion: Psychological distress seems to precede the experience of somatic symptoms in daily life in patients with stress-related disorders. In patients who experienced trauma there is a smaller correlation between self-reported psychological distress and physical symptoms, which might suggest a lower ability to “recognize psychological stress in the body”, regardless of specific diagnosis.

25) Abstract 1673

OPTIMISM IS ASSOCIATED WITH REDUCED NEUTROPHIL RESPONSE TO AN INFLAMMATORY CHALLENGE

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Introduction

There is ample evidence suggesting better physical and psychological health outcomes for optimists. However, there is also work demonstrating that optimism is not always a protective factor for immune functioning. Segerstrom (2006) found that optimism is related to better immune responding when stressors where controllable, and poorer immune responding when stressors were more difficult to manage. No research so far has examined if trait optimism and pessimism predict immune responding to an inflammatory challenge. We examined associations of trait optimism and pessimism with immune system responses to endotoxin in the form of typhoid vaccine.

Methods

Twenty-four healthy males were recruited for this pilot study (Mean age = 38.04, range = 20-60). Participants filled out questionnaires, including the Life Orientation Test Revised (LOT-R) measure of optimism and pessimism during a screening visit. Then, participants were randomly assigned to receive either the polysaccharide form of the typhoid vaccine or a placebo saline injection. Participants had blood drawn at baseline immediately before the vaccine/placebo and again at 2 and 4.5 hours after the vaccine. We measured white blood cell counts and a complete blood count with differential, which evaluates number of different types of circulating immune cells

Results

The vaccine elicited a significant immune response. Participants who received the typhoid vaccine compared to the placebo showed a significant increase in white blood cell count (WBC), $F(2,18) = 7.79$, $p=.01$, and neutrophil count, $F(2,18) = 7.23$, $p= .02$, but no significant changes in lymphocytes, monocytes, eosinophils, and basophils. Higher scores on the optimism scale of the LOT-R were associated with reduced neutrophil responses to vaccine ($r = -62$, $p = .04$) but not with WBC increases, whereas pessimism was not associated with change in WBC or neutrophil count.

Discussion

Our findings show that participants who received the typhoid vaccine compared to placebo had a significant increase in WBC and neutrophils from baseline to 4.5 hours post vaccine. Trait optimism predicted a reduced increase in neutrophils in response to the typhoid vaccine, whereas pessimism was not associated with immune cell responses to vaccine. Further research is needed to clarify if this reduced response is associated with worse overall vaccine responsiveness.

26) Abstract 1698

PTSD AMONG FORMER ISLAMIC STATE CHILD SOLDIERS IN IRAQ

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Former child soldiers are at high risk of developing mental disorders. This study looks at the prevalence of PTSD, depression and associated risk factors such as disturbed self-esteem among former child soldiers of the so-called 'Islamic State'.

The psychological effect of traumatic events was assessed in 81 Yazidi children who had been child soldiers for the Islamic State in northern Iraq between 2014 and 2017 for at least 6 months. The children were between 8 and 14 years of age. Thirty-two Yazidi boys and 31 Muslim boys who were not child soldiers in Iraq served as control groups. A structured psychological interview and psychometric questionnaires were used to assess traumatisation and mental disorders.

The child soldiers showed a higher prevalence of PTSD (48.3%), depressive disorders (45.6%), anxiety disorders (45.8%) and somatic disturbances (50.6%) than the boys who had not been child soldiers. Developmentally crucial self-esteem was significantly reduced in former child soldiers. No significant differences between the two control

PTSD and other mental disorders are highly present among former child soldiers in northern Iraq. The study highlights the huge and as yet unmet need for psychological services among former child soldiers.

Ref.:

Kizilhan JI, Noll-Hussong M. Post-traumatic stress disorder among former Islamic State child soldiers in northern Iraq. The British journal of psychiatry : the journal of mental science. 2018;213(1):425-9.

27) Abstract 1108

EARLY ADVERSITY AND TONIC MEASURES OF INFLAMMATION ACROSS THE LIFESPAN: A META-ANALYTIC REVIEW

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Background: Early adversity is an important contributor to risk for chronic disease, and heightened inflammation is thought to be a key mechanism underlying this association. However, the strength of the link between early adversity and inflammation varies across studies. Some of this variability may stem from differences in sampling age, and there are reasons to believe that the strength of this link increases across the lifespan. In particular, several of the biological and behavioral pathways connecting early adversity with inflammation typically become established later in life after their effects have accumulated over time. Moreover, commonly-assessed inflammatory markers tend to remain low early in life, either in the undetectable or at the bottom ranges where signals are typically noisiest. Thus, the early adversity-inflammation link may become more evident with progression through the lifespan. To test this notion, the present meta-analytic review estimated the magnitude of the link between early adversity and systemic inflammation and investigated whether the developmental stage at which inflammation was assessed would moderate this link. **Method**: Based on an electronic search of PubMed, we identified 108 published empirical articles reporting on 495 associations between various forms of early adversity (e.g., socioeconomic disadvantage, maltreatment, and interpersonal stress) and markers of systemic inflammation (e.g., CRP, IL-6, TNF-a) across 109,430 participants. **Results**: Multilevel modeling revealed a small association between early adversity and inflammation across adversity types and markers of inflammation, r = .08, 95% CI [.042, .111]. However, effect sizes varied based on the developmental stage at which inflammation was assessed, b = .10 (.05), 95% CI [.001, 194], such that the predicted magnitude of the early adversity-inflammation link increased across the lifespan, from studies of childhood (r = .01; 0 – 12 years old) to adolescence (r = .06; 13 to 18 years old) and adulthood (r = .11; older than 18 years). **Conclusions**: These findings support the notion that early adversity is associated with heightened inflammation and that the magnitude of this association strengthens with development. These findings highlight the importance of considering the developmental context when examining the early adversity-inflammation link.

28) Abstract 1341

COGNITIVE BEHAVIORAL THERAPY LEADS TO BIDIRECTIONAL ALTERATIONS IN THE BRAIN-GUT AXIS AND SYMPTOM IMPROVEMENT IN PATIENTS WITH IRRITABLE BOWEL SYNDROME

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Background: Irritible Bowel Syndrome (IBS) is a disorder of brain-gut interactions, presenting with chronic abdominal pain and altered bowel habits. The fact that cognitive behavioral therapy (CBT) is one of the most effective therapies for IBS, supports a key role of the brain in IBS pathophysiology. Alterations in the gut microbiome have been demonstrated in IBS, but causality is not established. We tested whether CBT-related symptom improvement is associated with changes in brain features and gut microbiota composition.

Methods: Resting-state fMRI and diffusion tensor imaging (DTI) was measured in 120 subjects (97 F) at baseline and two weeks post CBT from 80 IBS patients, who were randomized to 10 weeks of CBT. GLMs determined differences in functional connectivity adjacency matrices formed from the Destrieux and Harvard-Oxford atlases following CBT in responders (N=51). To examine white matter tracts, voxel-based permutation testing on fractional anisotropy (FA) and average diffusion coefficient (ADC) images was conducted. In a subset of 49 (39 F) patients, stool samples were collected at baseline and 12 weeks after CBT. 16S rRNA sequencing and metabolomics analysis were performed and differential abundance was determined using GLMs. All significance was set after correction using the false-discovery rate (FDR) at $q<0.05$.

Results: Following CBT, patients showed large symptom improvement indexed by the IBS-SSS ($t_{(77)}=-9.44, p<.0001$), with 51 subjects ("responders") showing a greater than 50-point decrease in symptom severity. Responders showed *decreases* in rs-FC in the brainstem to temporal cortices and posterior insula (all $q=.04$), anterior insula to anterior mid-cingulate ($q=0.04$), and *increased* ADC, representing *decreased* white-matter density in the brainstem ($q<.0001$). CBT responders increased relative microbial abundance towards the phylum *Bacteriodites* ($q<.001$), and an induction of 5 bacterial genera, most notably *Bacteroides* (2.5 fold, $q=4x10^{-5}$).

Conclusions: Multimodal brain findings show CBT-induced symptom improvement is associated with reduction in connectivity of several brain networks with brainstem regions, and is associated with an increase in the relative abundance of *Bacteroides*. These findings suggest an important role of ascending brainstem influences on brain networks in IBS, and the a role of the brain modulating of gut microbiota.

29) Abstract 1788

FINANCIAL STRESS AND GLUCOCORTICOID RESISTANCE: THE MODERATING ROLE OF PARENTAL INVOLVEMENT

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Objectives: Socioeconomic status (SES) health disparities have been documented among youth with asthma, with children growing in more socioeconomically disadvantaged homes experiencing worse asthma symptoms and greater levels of inflammation than children from well-off families. However, recent evidence suggests that certain individual and family-level factors can mitigate these health disparities. In a group of children affected by asthma, we investigated the potential moderating role of parental involvement on financial stress and asthma-related immune responses, assessed via leukocytes glucocorticoid resistance (GR). Methods: One hundred and forty-three youth (age 10-16) with asthma completed measures of parental involvement, while their primary caregiver reported their level of education, income, and financial stress, which was objectively assessed with the UCLA Life Stress Interview. Peripheral blood mononuclear cells from youth participants' blood were isolated, cultured, and assayed to determine mitogen-stimulated (PMA/INO + Etho) and mitogen/hydrocortisone-stimulated (PMA/INO + Cort) levels of interleukin(IL)-5, IL-13, and interferon(IFN)-γ. GR was calculated by subtracting log-transformed cytokines concentration in the PMA/INO + Etho samples from log-transformed cytokines concentration in the PMA/INO + Cort samples. A composite of GR for Th-2 cytokines was derived by combining IL-13 and IL-5 (N = 143), while a separate measure of GR for IFN-γ, a Th-1 cytokine (N = 132), was derived. Results: Regression analyses showed significant interaction effects between parental involvement and financial stress on the GR Th-2 cytokines composite (b = -0.122, SE = 0.044, $p < .01$), but not on GR for IFN-γ (b = -0.058, SE = 0.043, *ns*). Specifically, financial was negatively associated with Th-2 cytokines GR among children reporting low levels of parental involvement, but not among children reporting high levels of parental involvement. Further, moderated mediation analyses suggested that financial stress mediated the link between lower SES (income and education) and greater GR for Th-2 only for those children who reported lower levels of parental involvement. Conclusions: These results highlight the protective role of parental involvement on health-related biological processes modulated by SES among youth with asthma.

30) Abstract 1311

TUMOR MITOCHONDRIA EXHIBIT ABNORMAL PHENOTYPES AND BLUNTED ASSOCIATIONS WITH POSITIVE AND NEGATIVE PSYCHOSOCIAL FACTORS

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Objective: Tumor cells exhibit altered function of mitochondria, cellular organelles involved in energy production and stress signaling. Mitochondria dynamically respond to biobehavioral processes; however, it is not known whether tumor mitochondria are responsive to these processes. Here we examined markers of mitochondrial content and activity and their relationship to psychosocial factors in ovarian tumor and benign tissue.

Methods: Psychosocial and clinical data were obtained pre-surgery from 177 ovarian cancer patients and 69 patients whose pelvic mass turned out to be benign (e.g., cysts, leiomyomas). Tissue was assayed for markers of mitochondrial content (citrate synthase [CS]), mitochondrial electron transport chain enzymatic activities (Complexes II and IV), and for the number of mitochondrial DNA (mtDNA) genomes/cell. These markers were compared according to clinical data. Correlations between mitochondrial and psychosocial variables were compared between benign and serous ovarian tumor tissue.

Results: Relative to benign tissue, ovarian tumors exhibited a 7.7-fold elevation in CS, a 3.2-fold elevated Complex II, and 6.35-fold elevated Complex IV (all $p<0.001$), indicating overall greater mitochondrial content in tumors. However, the energy producing capacity on a per-mitochondrion basis was 34-54% lower in tumors ($p<0.001$), indicating lower quality. Similarly, the abundance of mtDNA per mitochondrion was 85% lower in tumors ($p<0.001$). In benign tissues, positive psychosocial factors (e.g., vigor, social support) were generally positively correlated with mitochondrial content and function, and negative factors (e.g., POMS fatigue, CESD depression) were generally negatively correlated ($p<0.05$). However, these effects

were consistently attenuated in tumor tissue (main effect p=0.003, interaction p<0.001).

Conclusion: Profound differences between benign and tumor tissue are consistent with a switch in mitochondria's role away from energy production to other growth-promoting functions. In line with previous work, mitochondria may respond to psychosocial factors, but this association appears blunted in tumors relative to benign tissue. This disparity suggests that psychosocial factors may be more likely to influence tumor growth and chemoresistance via effects on surrounding tissue and the organism rather than directly on the tumor.

31) Abstract 1356

CUMULATIVE LIFETIME STRESS EXPOSURE AND LEUKOCYTE TELOMERE LENGTH ATTRITION: THE UNIQUE ROLE OF STRESSOR DURATION AND EXPOSURE TIMING

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Background: Stress exposure occurring across the lifespan increases risk for disease, potentially involving telomere length shortening. Stress exposure during childhood and adulthood has been cross-sectionally linked with shorter telomere length. However, few longitudinal studies have examined telomere length attrition over time, and none have investigated how stressor duration (acute life events vs. chronic difficulties), timing (childhood vs. adulthood), and perceived severity may be uniquely related to telomere length shortening. **Methods**: To address this issue, we administered a standardized instrument for assessing cumulative lifetime stress exposure (Stress and Adversity Inventory; STRAIN) to 175 mothers of children with Autism Spectrum Disorder or neurotypical children and measured their leukocyte telomere length (LTL) at baseline and 2 years later. **Results**: Greater count of lifetime stressors was associated with shorter LTL at baseline and greater LTL attrition over time. When separating lifetime stressors into acute life events and chronic difficulties, only greater count of chronic difficulties significantly predicted shorter baseline LTL and greater LTL attrition. Similarly, when examining timing of stressor exposure, only greater count of chronic childhood difficulties significantly predicted shorter baseline LTL and greater LTL attrition. Post-hoc analyses suggested that chronic difficulties occurring during earlier childhood (0-12 years) were associated with greater LTL attrition. Cumulative stressor severity predicted LTL attrition in a parallel manner, but was less consistently associated with baseline LTL. **Conclusions**: These data are the first to examine the effects of different aspects of cumulative lifetime stressor exposure on LTL attrition over time, suggesting that accumulated chronic difficulties in childhood may play a unique role for telomere shortening in midlife.

32) Abstract 1171

ALLOSTATIC LOAD AND INFLAMMATION ARE ASSOCIATED WITH DISORDERED SLEEP IN OBESE PREGNANT WOMEN

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Background

Disordered sleep is associated with increased risk for adverse pregnancy outcomes. Disordered sleep, a chronic stressor, is also associated with inflammation as well as allostatic load (AL), a measure of cumulative wear and tear. Inflammation and AL are also associated with risk for adverse pregnancy outcomes. We propose that AL and inflammation may provide a mechanistic link whereby disordered sleep could lead to adverse pregnancy outcomes. In this study, we evaluated sleep, AL, and inflammation in a cohort of obese women in early pregnancy. We hypothesized that women with higher scores for the Berlin Questionnaire and Apnea Hypopnea Index (AHI) and with shorter reported and measured sleep duration have higher AL and levels of inflammatory markers.

Methods

This is a secondary analysis of data from the Sleep Apnea in Pregnancy Screening Study (SAPSS). Participants were obese and less than 15 weeks gestation at their study visit. We divided nine components of AL among three domains of cardiovascular, metabolic, and inflammatory function and calculated AL as the sum of the proportion of components designated high risk for each domain. Sleep apnea symptoms were evaluated by the Berlin questionnaire. Sleep apnea was diagnosed using portable overnight polysomnography. Sleep studies were scored by an independent sleep reading center. AHI ≥5 events/hr was diagnostic of sleep apnea. For sleep duration, we used self-reported sleep duration and measured sleep duration from portable overnight polysomnography. For each measure, we used linear regression to examine associations with AL and with inflammatory markers (ICAM, galectin, CRP, TNF, and sIL6r). Non-normally distributed data underwent log transformation prior to analysis.

Results

Forty-seven women met criteria for inclusion of the analysis. AL was associated with increasing AHI (p=0.028). ICAM was associated with AHI (p=0.043) and Berlin score (p=0.031). There were no significant associations with reported sleep time or with measured sleep time though AL showed a trend toward significance (p=0.053) with measured sleep time.

Conclusions

In early pregnancy in obese women, higher AL and ICAM were associated with increasing sleep apnea severity. AL and inflammation may provide a mechanistic link between disordered sleep and adverse pregnancy outcomes.

33) Abstract 1713

SLEEP APNEA PHENOTYPES IN US VETERANS

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Introduction: Obstructive sleep apnea (OSA) is a prevalent sleep disorder with clinical symptoms leading to significant impairment. OSA diagnosis is made calculating an apnea-hypopnea index (i.e., AHI; number of breathing events/hr). Additionally, oxygen levels are observed throughout the sleep study. Both insomnia and excessive daytime sleepiness are common in patients with OSA. We sought to determine if specific phenotypes existed among patients with OSA based on 1) AHI, 2) oxygen levels during sleep, 3) insomnia symptoms and 4) subjective daytime sleepiness. We also sought to find predictors of these phenotypes.

Methods: Participants were 660 veterans diagnosed with OSA at the Miami VA Sleep Clinic. Veterans completed several questionnaires including the Insomnia Severity Index (ISI) and the Epworth Sleepiness Scale (ESS). The ISI assesses nighttime and daytime symptoms associated with insomnia. The ESS asks how likely the respondent is to fall asleep in various situations. Latent profile analysis (LPA) was used to detect OSA types. The following indicators were used to predict subgroup membership: age, BMI, mood disorder, PTSD, and chronic pain.

Results: Four OSA subgroups were identified. Group 1 (22% prevalence) had moderate OSA, yet minimal clinical symptoms of insomnia or daytime sleepiness. Group 2 (56% prevalence) had

moderate OSA but severe insomnia and daytime sleepiness. Group 3 (16% prevalence) had severe OSA along with moderate insomnia complaints and daytime sleepiness. Group 4 (6% prevalence) had severe OSA, significant oxygen desaturations, moderate insomnia and significant sleepiness. Mood disorder, PTSD and chronic pain distinguished Group 2 from all other groups. It appears that the elevations in the ISI and ESS may be attributed to comorbid psychiatric conditions. Group 4 was distinguished from the others by a significantly higher BMI. The oxygen desaturations observed in this group may be related to this excessive weight.

Conclusions: We identified 4 OSA phenotypes. Over half of our patients had moderate OSA, yet severe insomnia and severe daytime sleepiness. These subjective symptoms were distinguished from other groups by the presense of psychiatric conditions. Obesity appears to be important in oxygen desaturations during sleep. Those with moderate OSA, yet minimal symptoms were the eldest in the cohort.

34) Abstract 1466

ASSOCIATION OF TRAUMA, POSTTRAUMATIC STRESS DISORDER SYMPTOMS, AND DEPRESSION PHENOTYPE WITH CHRONIC INFLAMMATION AMONG WOMEN.

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Background/Aim. Numerous studies have documented higher risk of cardiovascular disease (CVD) among women with posttraumatic stress disorder (PTSD) or depression, independently. However, whether effects of PTSD are confounded or exacerbated by depression, or potentially are exchangeable in relation to CVD risk, is understudied. We examined the association of trauma with PTSD and/or depression with C-reactive protein (CRP), a marker of systemic inflammation, among U.S. women.

Methods. Data are from the Nurses' Health Study II PTSD sub-study, including 3,248 women with CRP measures from at least 1 of 2 blood draws (1: 1996-1999; 2: 2008-2011). Trauma exposures and corresponding PTSD symptoms were measured with the Brief Trauma Questionnaire and Breslau' Short Screening Scale for DSM-IV PTSD, and time-updated based on year of first/worst trauma. Depression was assessed via self-reported biennial survey items querying physician-diagnosed depression, antidepressant use, and depressive symptoms from either the 5-item Mental Health Inventory (score<60) or the 10-item Center for Epidemiologic Studies Depression scale (score>10), and time-updated in analyses. Batch-effects-adjusted log-transformed values of CRP were used. Associations of trauma and PTSD/depression with CRP was examined cross-sectionally using linear mixed effects models (n=3,248), and prospectively using linear regression with change in CRP among 929 women who had a consistent trauma and PTSD/depression phenotype between blood draws.

Results. Compared to women with no trauma and no depression, those with PTSD symptoms and depression (*b* 0.17, SE 0.06, *p* 0.01) and those with trauma and depression only (*b* 0.16, SE 0.07, *p* 0.02) had cross-sectionally higher CRP levels, after adjusting for sociodemographic and medical conditions. Over 10-12 years, compared to women with no trauma/no depression, those with trauma and PTSD/depression (*b* 0.21, SE 0.10, *p* 0.04) had elevated CRP levels, after covariate adjustment. While not statistically significant, those with trauma and depression only (*b* 0.26, SE 0.15, *p* 0.08) and trauma only (*b* 0.19, SE 0.10, *p* 0.06) showed a similar pattern.

Conclusions. Findings suggest individuals with trauma exposure followed with other types of distress (e.g., depression) may have elevated inflammation, potentially as harmful as that among those with both depression and PTSD.

POSTERS

35) Abstract 1756

VISCERAL SENSITIVITY ASSOCIATED WITH ALEXITHYMIA IN PATIENTS WITH IRRITABLE BOWEL SYNDROME

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Background: There have been inconsistent reports in the association between alexithymia and interoception, which refers to the sensing of signals from the body. The high rate of alexithymia has been reported in chronic pain conditions including irritable bowel syndrome (IBS). Visceral hypersensitivity is a core character in the chronic pain conditions, however, little has been known about visceral sensitivity in these condition in relation to alexithymia. We examined the association between alexithymia and visceral sensitivity in patients with IBS.

Methods: This study included 29 IBS patients and age- and sex-matched 33 healthy control subjects. Alexithymia was assessed by 20-item Toronto Alexithymia scale (TAS-20). The participants completed the Visceral Sensitivity Index (VSI), Somatosensory amplification scale (SSAS), and Body Awareness Questionnaire (BAQ). Using a computer-controlled barostat pump, perception threshold in the colorectal was assessed using the ascending method of limits (AML). The participants were instructed to evaluate the intensities of pain, urgency and discomfort to defecate experienced on a 0–10 numerical scale, where 0 indicated no sensation and 10 indicated maximal sensation. The ratings at 18mmHg stimulation level were used to compare the visceral sensitivity between IBS and groups.

Results: There was no significant difference in TAS-20 score between controls and patients with IBS. In the control group, TAS-20 score was positively correlated with SSAS score ($p<0.001$) and negatively correlated with BAQ score ($p=0.003$). In IBS group, TAS-20 score was negatively correlated with BAQ score ($p=0.003$). There were significant between-group differences in pain ($p=0.007$), urge ($p=0.04$), and discomfort ($p=0.006$) ratings between controls and IBS groups. In IBS group, TAS-20 score was negatively correlated with pain rating ($\beta robust = -0.1 \pm 0.05$, $p = 0.046$) and urge rating ($\beta robust = -0.07 \pm 0.03$, $p = 0.03$). In the control group, there was no significant association between alexithymia scores and pain, urge, and discomfort rating.

Conclusion: IBS patients with high TAS-20 demonstrated relatively hypo-sensitivity to the rectal distention. Alexithymia may contribute to the pathology of IBS not via enhancing visceral hypersensitivity but via atypical interoception.

36) Abstract 1169

INTESTINAL MICROBIOME IN IRRITABLE BOWEL SYNDROME BEFORE AND AFTER GUT-DIRECTEDHYPNOTHERAPY

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Background. Irritable bowel syndrome (IBS) is a disorder with brain-gut-microbiome alterations. Gut-directed hypnotherapy (GHT) has been shown to improve quality of life and symptoms in IBS. This therapy targets psychological coping, central nervous processing and brain-gut interaction. Studies have also demonstrated effects of hypnosis on intestinal transit and the mucosal immune system. So far, no study has examined the effect of GHT on the intestinal microbiome. This study aimed at examining microbial alterations, IBS symptoms, and psychological distress before and after GHT.

Methods. Fecal samples were collected from 38 IBS patients (Rome-III criteria, mean age 44 years, 27 female, 11 male, 22 diarrhea-dominant, 12 alternating-type and 4 constipation-dominant IBS) before and after 10 weekly group sessions of GHT. Assessments in psychological (perceived stress, PSQ; psychological distress, HADS-D; quality of life, visual analogue scales) and IBS symptom-related variables (IBS severity, IBS-SSS; single symptoms, visual analogue scales) were performed with validated questionnaires. Faecal samples underwent microbial 16S rRNA analyses (regions V1-2).

Results. Microbial alpha diversity was stable before and after GHT (chao1 2591 ± 548 vs. 2581 ± 539, p= .92). No significant differences were found in relative bacterial abundances but trends of reduced abundance of Lachnospiraceae 32.18 [24.14-39.89] Median [Q1-Q3] vs. 28.11 [22.85; 35.55] and Firmicutes:Bacteroidetes ratio after GHT were observable. Significant reductions in symptom severity (323 [266-371] vs. 264 [191-331], p= .001) and psychological distress 17,0 [12,6 -21,8] vs. 12,0 [8,3 -18,0], p=.001, and increased well-being were found after GHT. Adequate relief after therapy was reported by 32 (84%) patients.

Conclusion. Reductions in IBS symptoms and psychological burden were observed after gut-directed hypnotherapy, but no systematic changes were found in intestinal microbiota. The findings suggest that hypnosis acts predominantly by central nervous modulation, and that IBS severity is independent from microbiota composition.

37) Abstract 1007

THE FEASIBILITY AND EFFECTIVENESS OF COGNITIVE-BEHAVIORAL THERAPY USING INTEROCEPTIVE EXPOSURE WITH PSYCHOEDUCATIONAL VIDEO FOR IRRITABLE BOWEL SYNDROME

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Background: We previously conducted an intervention study which was a single-arm open-label clinical trial by using the Japanese version of the interoceptive exposure-based cognitive-behavioral therapy (CBT-IE) for irritable bowel syndrome (IBS) (Oe et al., in submission). The results revealed that abdominal symptoms improved soon after and 6 months after the intervention compared to pre-intervention. However, we needed 65 minutes for each face-to-face session on an average, which made it highly time-consuming. To shorten the duration, we developed an educational video without changing the contents of original CBT-IE. We aimed to examine whether the CBT-IE with educational video is more effective for alleviating symptoms and reducing the duration than the former one.

Methods: The study was a single-arm open-label clinical trial. Seventeen IBS patients (m/f = 5/12, 21-65 years) were recruited. The CBT-IE with video consists of ten weekly individual sessions. Patients were educated about IBS symptoms and cognitive behavioral skills by presenting video as a homework, which was discussed in the subsequent face-to-face session of 30 minutes. Primary outcome measure was severity of IBS symptoms (The Japanese version of the IBS-severity scale; IBSSI-J), which was performed by patients pre-intervention, post-intervention, 3-month and 6-month follow-ups. Linear mixed model analysis was made of IBSSI-J scores to evaluate changes over time in this program, and between the current program (n=8) and the former one (n=19). Then, we compared lengths of each session of the current program with those of the former one using t-test.

Results: A significant effect of time was found in IBSSI-J scores within the current program (F (3, 16.33) = 10.98, $P < 0.01$). Between

the current and the former program, a significant effect of time was also found in IBSSI-J (F (3, 16.33) = 10.98, P < 0.01), but no significant effect of group nor effect of group and time in IBSSI-J. From pre- to post-intervention, both groups showed a reduction in IBSSI-J, which lasted till 3-month and 6-month follow-ups. The time required for a session was about 27 minutes shorter than that of the former program (t (25) = 9.44, P < 0.01).

Conclusions: The CBT-IE with educational video for IBS may be effective for alleviating symptoms. With this program, the effort of therapists in psychotherapy may be reduced.

38) Abstract 1359

PERCEIVED PAIN AND STRESS IN PATIENTS WITH ULCERATIVE COLITIS AND IRRITABLE BOWEL SYNDROME IS ASSOCIATED WITH DIFFERENCES IN FUNCTIONAL AND MICROSTRUCTURAL BRAIN NETWORK CENTRALITY

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Introduction: Both Ulcerative Colitis (UC), an inflammatory bowel disorder, and Irritable Bowel Syndrome (IBS), a functional GI disorder, are associated with altered bowel habits and abdominal pain. UC patients generally report less abdominal pain than IBS. We aimed to determine if UC and IBS patients (when compared to health controls [HCs]) exhibited differing neuroplastic alterations in pain processing networks that are correlated to behavioral parameters.

Methods: Functional resting state (RS) and diffusion tensor imaging (DTI) were obtained in an age and sex matched sample of 74 (39 F) UC patients in clinical remission, IBS patients and HC. Following preprocessing, we used graph theory network metrics (betweenness centrality) to compute the degree of network connectivity between somatosensory network regions. General linear models tested for group differences, and partial correlations assessed network relationships with clinical symptoms, while controlling for age and sex.

Results: Patients with UC and IBS both had greater visceral sensitivity (VSI) and Perceived Stress Scale (PSS) scores in comparison with HCs (p(s)<.001). IBS patients had greater VSI and PSS in comparison with UC (p<.001, p=.002). Patients with UC had greater DTI betweenness centrality (p=0.024) in the left superior frontal gyrus (SFG), correlating negatively with PSS scores (r=-.33,p=0.007), and greater RS strength in the left SFG (p=0.03), positively correlated with PSS scores (r=0.27,p=0.02). IBS patients had greater DTI betweenness centrality in the left SFG (p<0.001), positively correlated with VSI scores (r=0.26,p=0.03) while lower RS betweenness centrality in the left SFG, negatively correlated with VSI scores (r=-.24,p=0.04).

Conclusion: Compared to HCs, both UC and IBS patients showed differing neural connectivity within the somatosensory network, which correlated with painful symptoms and perceived stress ratings. Changes in SFG centrality in IBS patients were associated with greater painful symptoms and perceived stress. In contrast, UC patients exhibit a more nuanced response, where greater local resting state centrality was attenuated via greater DTI centrality. This could potentially be a compensatory mechanism to explain reports of less symptom severity and exacerbations despite chronic mucosal inflammation.

39) Abstract 1520

QUALITY OF LIFE OF ELDERLY PEOPLE WITH MENTAL ILLNESS ATTENDING PSYCHIATRIC HOSPITALS IN KHARTOUM STATE (OCTOBER 2017 TO MARCH 2018)

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Background: The world population is aging rapidly; those elderly people suffer from multiple health disorders due to the vulnerability for many physical and psychological stressors, which as a result will affect their quality of life.

Aim: This study aim to determine quality of life in elderly people with mental illness attending psychiatric hospitals in Khartoum state and it's different domains (physical, psychological, social relationships and environmental). In addition to determine factors affecting quality of life of those patients along with study of the relationship between the quality of life in elderly patients with mental illness and the major psychiatric disorders in Khartoum state.

Method: This cross- sectional study was conducted to assess total of 176 elderly with mental illness (male =94, female =82) age ≥ 60 years. The participants surveyed in this study were elderly people who were attending two psychiatric hospitals in Khartoum state. Arabic version of World Health Organization Quality of Life-BRIEF (WHOQOL-BRIEF) questionnaire and another structured questionnaire (contain socio-demographic and clinical data) were used to determine the quality of life in elderly people with mental illness during the period of October 2017 to March 2018.

Result: Quality of life scores in this study were significantly low, only 7.4 % reported good quality of life and 92.6% reported poor quality of life. Male elderly had slightly high score in the quality of life; however, these differences were not significant. A significant difference was observed between different levels of education, with those of lower education having poorer QOL. Also, there was significant difference between being married and having good quality of life.

Conclusion: Overall quality of life was poor in elderly with mental illness attending psychiatric hospitals in Khartoum state.

40) Abstract 1321

DIFFERENCES IN LIFETIME STRESS EXPOSURE IN FEMALE ADOLESCENTS AT VARYING RISK FOR DEPRESSION

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Adolescent daughters of depressed mothers are at high risk of developing depression themselves (Goodman et al. 2006). This intergenerational transmission of risk may be due to many factors, such as heritability; neuroregulatory mechanisms; exposure to mother's maladaptive cognitions, behaviors, and affect; and exposure to stressful environments. Several studies have explored stress and depression in high-risk females (e.g., Gershon et al. 2011), but few have taken a lifespan approach. To address this issue, we characterized lifetime stress among adolescent females at high- and low-risk for depression using the Stress and Adversity Inventory (STRAIN; Slavich & Shields, 2018).

51 never-depressed female adolescents (M_{age}= 14.90 years, SD = 1.23) completed the Adolescent STRAIN, a 75-item online interview that enquires about acute life events and chronic difficulties across 12 life domains and 5 social-psychological characteristics. 29 participants were low-risk (i.e., girls whose mothers have never experienced depression), and 22 were high-risk (i.e., girls whose mothers have experienced at least one major depressive episode).

Independent t-tests showed that high-risk daughters experienced significantly more chronic difficulties than low risk daughters over the lifespan (p = .043). Specifically, high-risk adolescents endorsed more chronic difficulties related to housing (p = .001), education (p = .004), and finances (p = .039), as well as those involving entrapment (p =

.024) and physical danger (p = .026). High risk daughters also experienced greater severity of chronic difficulties related to housing (p = .001) and education (p = .004), and those involving entrapment (p = .047) and physical danger (p = .037).
In sum, girls at high risk for depression appear to specifically experience types of major stressors across the lifespan that are chronic and relatively inescapable. Although depression risk is ultimately attributable to many factors, these data support the idea that lifetime stress exposure is one factor that may influence intergenerational risk for depression. Assessing such exposures may thus be important for understanding, and potentially mitigating, risk for depression in adolescence.

41) Abstract 1547

ASSOCIATION OF DEPRESSION AND FAVORABLE CARDIOVASCULAR HEALTH IN BRAZIL.

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Background: Depression is associated with poor cardiovascular health (CVH) and increased risk of cardiovascular disease in high-income countries. However, it is unclear whether depression may similarly contribute to poor CVH in a different socioeconomic context. Identifying the association of depression and CVH would provide valuable insight for prevention strategies. Our aim was to investigate the association of depression and favorable CVH in Brazil, a middle-income country.
Methods: This cross-sectional study draws on 49,658 individuals (≥18 years) who participated in the 2013 National Health Survey in Brazil. Favorable CVH was defined by meeting recommended levels on five CVH components (systolic and diastolic blood pressure <120 and <80 mmHg, respectively; no previous diagnosis of diabetes or hypercholesterolemia; body mass index <25 kg/m^2; never smoking or quitting smoking >12 months). Depression was assessed using the Patient Health Questionnaire-9 (depression determined if score ≥10). We considered an overall depression score and two sub-domains, somatic and cognitive symptoms. Covariates included age, race, income, education, region of residence, marital status, chronic diseases, and behaviors (diet and exercise). Logistic regression was used to test the association of favorable CVH and depression while controlling for all covariates.
Results: Individuals with depression had a lower prevalence of favorable CVH compared to those without depression (10.0% vs 14.1%; P<0.0001). Depression was associated with a 27% lower odds of having favorable CVH (OR 0.73; 95%CI 0.62-0.86) after adjusting for sociodemographic factors. The association was stronger among women. Both somatic and cognitive depression symptoms were associated with lower odds of having favorable CVH (somatic: OR 0.97; 95% CI 0.95-0.99; cognitive OR 0.96; 95%CI 0.94-0.98). Participants without depression were more likely to have favorable status on each component of favorable CVH in comparison to depression group, except for blood pressure (graph).
Conclusions: Depression is associated with lower odds of having favorable CVH in Brazil, independent of socioeconomic factors, chronic diseases, and behaviors. Increased surveillance of evaluating CVH among depressive individuals may contribute to the development of strategies to decrease cardiovascular morbidity in this population.

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42) Abstract 1820

ASSESSING CHANGES IN AUDITORY HALLUCINATIONS PERCEPTION IN RESPONSE TO TREATMENT: A PILOT STUDY.

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Affecting more than 70% of patients with Schizophrenia (SCZ), the presence of auditory hallucinations (AH) is considered a mainstay clinical feature or a characteristic common symptom in patients affected with this psychiatric disorder. The cognitive model argues that the way patients perceive "voices" may influence their emotional and behavioral reactions. The three voices or perceptions are omnipotent (power the voices have over the listener), benevolent (intent to do good) or malevolent (intent to do harm) with implications on affectivity, autonomic regulation, and disease severity. While antipsychotics may decrease AH severity and frequency, what is not known is whether or not the patient's AH perception changes in response to acute treatment with antipsychotics. Our hypothesis is that AH perception will not change with medication, but malevolent voices result in poor Heart rate variability (HRV) and increased disease severity.
Methods: We are assessing AH perceptions using the standardized instrument Belief About Voices Questionnaire-Revised (BAVQ-R) and SCZ severity using Positive-&-Negative-Syndrome-Scale (PANSS). To test cognition, CANTAB cognitive-testing software is performed. Physiological changes are assessed using a one-time measurement of HRV administered during cognitive testing.
Results: The collection of data is still underway, however, we expect to find that patient's perceptions of auditory hallucinations will not change in response to acute treatment.
Conclusion: Successful completion of the present study will shed light on our understanding of the relationship between the perceptions of AH and treatment in a population with SCZ. This new understanding may lead to therapeutic interventions tackling these perceptions, ultimately ameliorating the disease severity and general wellbeing, both mentally and physically, in patients suffering from SCZ.

43) Abstract 1482

LONGITUDINAL EVOLUTION OF PANIC ATTACKS IN PATIENTS SUFFERING FROM NON-CARDIAC CHEST PAIN

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Background : The current project aims to evaluate, in patients suffering from both non-cardiac chest pain and panic attacks, the incidence of panic disorder six months after an emergency department (ED) consultation and identify the predictive factors of the development of panic disorder in this population.
Methods : One hundred and thirty-eight patients having consulted in the EDs of the Hôtel-Dieu de Lévis and the Center Paul-Gilbert of the Integrated Health and Social Services Center in Chaudière-Appalaches completed a telephonic interview and a series of questionnaires within the 30 days following their medical consultation, in addition to a telephonic interview at the six-month follow-up.
Results : Results show that 10.1% of the participants had developed a panic disorder six months after their ED consultation. Among the predictive factors in this study, only anxiety sensitivity was significantly associated with the development of this mental health disorder. Mediation analyses suggest that the effect of psychological distress, as measured by the Hospital Anxiety and Depression Scale, on panic disorder incidence is completely meditated by anxiety sensitivity.
Conclusions : Anxiety sensitivity seems to play a predominant role in the development of panic disorder in patients with panic attacks. Interventions that specifically target this factor in patients having non-cardiac chest pain and panic attacks could help prevent them from developing panic disorder.

44) Abstract 1824

TIME COURSE CHANGES IN SUICIDALITY AND HEART RATE VARIABILITY IN AN INPATIENT PSYCHIATRY SETTING: LINKING AUTONOMIC FUNCTION AND BEHAVIOR

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Objective:

Studies highlight the association between mental illness and suicidality, moreover they indicate a link between suicidality and autonomic dysregulation manifested as vagally mediated cardiovascular functioning. This may be due to reduced inhibitory cognitive control capacity. However, lacking are studies assessing cardiac autonomic correlates of suicidal severity and its response to treatment. In this study we sought to identify association between autonomic function with suicidal severity in acute inpatient psychiatric setting throughout treatment.

Methods:

Nine (F=2) Baker acted patients admitted to psychiatric unit for active suicidal behavior or ideations were enrolled in the study. Heart Rate Variability (HRV) readings were obtained twice a day for 1 hour duration (7AM and 7PM) for three consecutive days using a hear rate monitor (Zephyr-biopatch). Suicidal severity was assessed using the Suicide Behavior Questionnaire-Revised (SBQ-R) on admission and then every day afterwards.

Results:

There was clinical improvement in all the subjects; Improved (BSQ-R) as suggested by the 12% decrease in scores. There was a tendency towards reduction in suicidality although statistically nonsignificant. Univariate pairwise comparisons analysis were used to evaluate time course changes in cardiac autonomic modulation in suicidal patients. Compared with day 1 Total power (global autonomic functioning), LF (baroreflex function), and HF (vagal function) decreased ($P<0.05$) whereas nuLF (sympathovagal tone) increased ($P< 0.05$) during day 3 (increased Sympathetic and decreased Parasympathetic)

Conclusion:

Results indicate that an acute clinical improvement of suicidality is associated with increased sympathetic and decreased parasympathetic activities in hospitalized psychiatric patients. This response seems to be very different from te one observe in chronic mental dieses. The role of psychotropics as a contributing factor in reduced HRV during recovery is considered. Further studies aimed at unveiling the underlying mechanisms accountable for autonomic regulation during acute suicidality are warranted.

45) Abstract 1019

INFLUENCE OF PREOCCUPIED ATTACHMENT AND SUPPRESSION OF ANGER ON SOCIAL ANXIETY

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Previous studies have shown that both attachment and anger management are important for the development of social anxiety, but studies that examine both factors together are lacking. The present study examines the significance of both factors for social anxiety in a large sample of those affected. A total of 310 individuals with social anxiety disorder (41% men, mean age 42±14.3) were examined in the context of the Social Phobia Research project at the Psychosomatic Clinic of the University of Bonn in Germany and compared with 106 healthy control subjects (36% men, mean age 34.6±15.2). After a Structured Clinical Interview on the diagnosis of Axis I disorders according to DSM-IV (SKID-I, Wittchen et al., 1997) subjects filled in the State Trait Anger inventory (STAXI, Spielberger, 1988), the Attachment Styles Questionnaire (ASQ; Oudenhoven et al., 2003), the Social Phobia Inventory (SPIN; Sosic et al., 2006), and the Beck Depression Inventory (Beck et al., 1978) . With regard to statistical analysis both groups were compared by means of a covariance analysis with the covariates age, sex and depression (BDI). The influence of attachment style (ASQ) and dealing with anger (STAXI) on social anxiety (SPIN) has been further explored by multiple regression and mediator analysis. Subjects with social anxiety disorder showed significantly lower levels of secure attachment style ($p <0.001$) and higher levels of preoccupied ($p<0.001$) and fearful ($p <0.001$) attachment style compared to healthy subjects. In terms of anger, socially anxious subjects showed significantly higher levels of anger suppression (anger-in). In the study group multiple regression could predict 30% (R^2adj.=0.30) of the extent of social anxiety (SPIN) by attachment style and anger management, only the predictors preoccupied attachment style ($\beta=0.186$, $p=0.001$) and anger-in ($\beta=0.241$, $p <0.001$) were significant. A subsequent mediator analysis showed that anger-in is a partial mediator between preoccupied attachment style and the extent of social anxiety. The study showed for the first time in social anxiety disorder that the influence of preoccupied attachment style on social anxiety is partly mediated by the suppression of anger. A stronger focus in diagnosis and therapy on anger management among the socially anxious could make a significant contribution to the reduction of social anxiety.

46) Abstract 1271

ASSOCIATION OF 5&ALPHA;-REDUCTASE INHIBITOR WITH SUICIDALITY

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BACKGROUND: Recent studies have raised concerns regarding psychiatric adverse effects related to 5α-reductase inhibitors, yet the association between 5α-reductase inhibitor use and suicide has been little-studied.

OBJECTIVES: To determine the risk of suicide upon 5a-reductase inhibitor exposure using a large nationwide cohort.

DESIGN: A retrospective cohort study using the Korean National Health Insurance Serviced database.

SETTING: Population-based.

PARTICIPANTS: The study population consisted of a total of 51,466 men aged 60 years or older who underwent health examinations from 2005 to 2006. Participants were classified into 5α-reductase inhibitor users and non-users base on drug exposure between 2003-2006. Drug users were additionally divided into tertiles based on cumulative 5α-reductase inhibitor exposure. Participants were followed-up for seven years from 1 January 2007 for suicide.

MEASUREMENTS: Death due to suicide.

RESULTS: Compared to 5α-reductase inhibitor non-users, no significant risk difference of suicide was observed among 5α-reductase inhibitor users (Hazard ratio 1.02; 95% confidential interval 0.70-1.48). Also, increasing dose of the drug exposure was not associated with increased risk of suicide (*p*for trend 0.543). The major limitation of this study is that possible drug exposure after the index date was not accounted for.

CONCLUSION: 5α-reductase inhibitor use was not associated with an elevated risk of suicide in a long-term period, even among patients with high dose drug exposure. Although physicians should be aware of possible increase in the risk of depressive symptoms related to 5α-reductase inhibitor use, the drug safety regarding suicide risk is reassuring.

Key words: 5α-reductase inhibitor; Finasteride; Adverse drug reaction; Depression; Suicide

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47) Abstract 1358

STRESS-DIATHESIS AND SUICIDE BEHAVIOR: UNPACKING CLINICAL SYMPTOMS, CORTISOL AND SUICIDE ATTEMPTS IN A HIGH-RISK GUYANESE SAMPLE

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Background: Although studied mostly in developed countries, the increased prevalence of suicide among youth, worldwide, is a preventable public health concern. Youth at highest risk for suicide are those separated from their biological parents and placed in a child welfare system. Based on the stress-diathesis model, the present study aimed to identify both biological and clinical factors associated with suicide attempts among institutionalized youth.

Aims: The present study measured youth cortisol activity (biological diathesis) and psychopathology (clinical diathesis), among poor, institutionalized youth, at high-risk for suicide, to identify correlates to suicide attempts.

Method: In a sample of 50 youth, average age 14yrs, the DSM-5 clinical symptoms measure was administered and saliva samples were collected. Poisson regression analyses tested the association between cortisol levels and clinical symptom measures on number of suicide attempts.

Results: 42% (N = 21) of the youth endorsed a previous suicide attempt. A minimum of 1 and maximum of 5 suicide attempts were self-reported by youth. Average cortisol level was 4.04 (Sd = 2.64), which is slightly above the average of 0.034 – 3.417 ug/dl in children and youth samples (Salimetrics, 2016). Youth number of suicide attempts were positively associated with cortisol levels (OR = 5.62) and disturbed sleep (OR = 1.24) in unadjusted and adjusted analyses.

Conclusions: These findings demonstrate that youth suicide attempts are correlated with elevated cortisol levels and sleep problems, which improve our understanding of hypothalamic-pituitary-axis dysregulation, early life adversity and suicide behavior.

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48) Abstract 1369

STABILITY OF DISORDERED MENTAL STRESS REACTIVITY IN WOMEN WITH COMPLEX POST-TRAUMATIC STRESS DISORDERS DESPITE INTENSIVE INTERVAL TREATMENT

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Posttraumatic stress disorder (PTSD) is associated with increased cardiovascular risk and blunted physiological reactivity to mental stressors, eg, exposure to a crying baby (CB). This follow-up study was conducted for testing the hypothesis that the initially abnormal reaction pattern normalizes after intensive treatment with psychotropic medication and psychotherapy.

We had performed psychophysiological stress testing in 54 women entering psychiatric interval treatment consisting of periods of intensive in-patient psychotherapy and individualized psychotropic medication (mean total duration of in-patient treatment phases 174 ± 97 days). Of 50 participants who could actually be treated, follow-up testing could be performed in 26 patients a mean of 39 ± 4 months later. Complete data were available for 21 patients (mean age 47 ± 9 years). As in the baseline assessment, patients completed a set of psychometric scales and were then exposed to a mental arithmetic (MA) task and a standardized CB audio recording while noninvasive hemodynamic and autonomic parameters were recorded by a Task Force Monitor system (CNSystems, Graz, Austria).

Follow-up participants and dropouts showed no relevant differences in baseline variables. When compared to baseline, anxiety, depressive symptoms and avoidance had decreased significantly until follow-up. However, patients still showed substantially elevated distress and personality problems. During the follow-up assessment, patients perceived both stressors as less distressing than at baseline (both $p<0.05$). In contrast to the reduced subjective distress measures, total peripheral resistance (TPR) showed an overall increase from baseline to follow-up (MA: 2660 ± 943 to 3080 ± 824 units; $p<0.05$; CB: 2720 ± 891 to 3319 ± 1011 units). None of the other measures (heart rate, systolic blood pressure, pre-ejection period (PEP), baroreflex sensitivity) showed significant pre-post changes. There were also no changes in stress reactivity or recovery, except for PEP which tended to decrease with CB at baseline and to increase at follow-up ($p<0.05$ for stressor * time interaction).

In conclusion, in women with complex PTSD an intensive interval treatment led to moderate reductions in distress, both in general and during the stress tests, but to an increase in overall TPR and only minimal changes in physiological stress reactions.

49) Abstract 1154

CROSS-CULTURAL LONGITUDINAL RELATIONS AMONG INTERNALIZING SYMPTOMS: THE CONTRIBUTION OF SOMATIC COMPLAINTS

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Background: Different internalizing symptom types (i.e., depression, anxiety, and somatic complaints) often occur concurrently, suggesting that they may be causally related, but the extent to which the occurrence of one type of internalizing symptom may increase the occurrence of another remains inconclusive. Some prodrome studies incorporating the tripartite model (which posits that a non-specific negative affect component explains the overlap between anxiety and depression, with anxiety distinguished by autonomic hyperactivity and depression distinguished by the absence of positive affect) find that anxiety predicts later depression while other studies document the reverse relationship. Culture may contribute to this variation in the developmental sequence of internalizing symptoms, but this has not been tested. In particular, somatic symptoms have been hypothesized as a culturally-acceptable way of expressing or experiencing emotional problems among Asian individuals. Therefore, somatic symptoms may distinctly predict increases in affective symptoms for this cultural group. The present study examined the longitudinal relationship between anxious, depressive, and somatic symptoms among European American, Vietnamese American, and Vietnamese adolescents across 6 months.

Methods: 304 European American, 420 Vietnamese American, and 717 Vietnamese adolescents' self-reported internalizing symptoms, assessed at three timepoints, were analyzed using multigroup cross-lagged models.

Results: We found that higher levels of anxious symptoms predicted increases in depressive symptoms for European American adolescents, but not for the Vietnamese American and Vietnamese adolescents. In contrast, somatic symptoms predicted higher levels of anxious symptoms for the Vietnamese American and Vietnamese adolescents, but not for the European American adolescents. Depressive symptoms also predicted higher levels of anxious symptoms in Vietnamese American and Vietnamese adolescents.

Conclusions: Somatic symptoms were prominent in the prospective relationships among internalizing symptoms for Vietnamese American and Vietnamese adolescents, suggesting there may be cultural differences in the experience of internalizing symptoms over time. Findings have implications for culturally-relevant early intervention targets, during a developmental period of risk for internalizing disorders.

50) Abstract 1408

ETHNIC IDENTITY AS MODERATOR OF SOMATIZATION OF ANXIETY SYMPTOMS IN LATINX YOUTH

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Background: Anxiety is the most prevalent mental disorder in the U.S., affecting up to 25% of children and is more prevalent among Latinx youth than Non-Hispanic White (NHW) youth. While anxiety is common among *all* youth, expression of anxiety symptoms differs across ethnic groups, with Latinx youth tending to somaticize, or manifest in the form of physical symptoms, anxiety. However, exhibiting high ethnic identity, or sense of belongingness to a particular ethnic group, has been shown to be a protective factor in Latinx youth against low self-esteem, academic achievement, depression, effects of acculturative stress, and substance abuse. The present study sought to examine whether ethnic identity would moderate the relationship between anxiety and somatic symptoms in Latinx youth, such that high ethnic identity would mitigate somatic manifestation of anxiety symptoms. It was hypothesized that Latinx youth with high levels of anxiety and high ethnic identity would have decreased somatic symptoms compared to Latinx youth with high levels of anxiety and low ethnic identity.

Methods: This study included 17 (ages 8-17, M = 12.53, SD = 2.40) Latinx children recruited through community postings and clinical referrals seeking children with and without anxiety. Children completed self-report measures, including the Screen for Child Anxiety Related Emotional Disorders-child version (SCARED-C; Birmaher, et. al, 1997) to assess the anxiety symptom severity, the Multigroup Ethnic Identity Measure-child version (MEIM-C; Phinney, 1992) to assess level of ethnic identity, and the Child's Somatization Inventory-child version to assess somatic symptom severity (CSI-C; Walker, et. al, 1991). A hierarchical regression analysis was conducted to examine the moderation hypothesis.

Results: The regression analysis revealed that ethnic identity did not significantly moderate the association between anxiety and somatic symptoms for Latinx children $F(4,12) = 1.37$, $p = .30$, $\Delta R^2 = .31$. Nor did post-hoc analyses reveal differences on the subscales of the MEIM-C.

Discussion: Given that Latinx youth are more likely than NHW youth to experience anxiety symptoms, but are less likely to be screened, seek treatment, or follow-through with treatment, there is a strong need to explore and invest in preventative measures among Latinx youth. Study limitations and future directions will be discussed.

51) Abstract 1810

CHANGES IN INFLAMMATORY BIOMARKERS IN ACTIVE DUTY SERVICE MEMBERS RECEIVING COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA AND NIGHTMARES

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Elevated levels of systemic inflammation have been observed in insomnia, and insomnia is associated with increased risk for other comorbid conditions, including cardiovascular disease, pain, immune dysfunction, and depression. Inflammation may be one potential biological mechanism linking insomnia and medical diseases. Studies have shown that insomnia is associated with increased levels of markers of systemic inflammation, including interleukin-6 (IL-6), C-reactive protein (CRP), and tumor necrosis factor alpha (TNF-α). However, no studies to our knowledge have examined how levels of systemic inflammation may change following cognitive and behavioral treatments of insomnia. The current study sought to examine if cognitive behavioral treatment of insomnia and nightmares was associated with decreases in inflammatory biomarker levels from pre- to post-treatment. As part of an ongoing randomized clinical trial, 33 participants with comorbid insomnia, nightmares, and PTSD completed 6 weeks of cognitive behavioral therapy for insomnia and nightmares (CBTin), with a blood draw taken immediately pre- and post-treatment for assessment of inflammatory biomarkers CRP, IL-1, IL-6, IL-10, and TNF-α. These blood samples are currently in the process of being assayed, and analyses will be conducted to examine changes in inflammation from pre- to post-treatment. Results will help elucidate if treatment of comorbid insomnia and nightmares may be associated with reductions in systemic inflammation, and findings may elucidate a potential biological mechanism to examine in future research.

52) Abstract 1838

NEURAL CORRELATES TO SYMPATHETIC AUTONOMIC AROUSAL IN PATIENTS WITH MAJOR DEPRESSION

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Major depression (MD) is associated with sympathetic predominance of autonomic regulation and an increased risk of cardiovascular morbidity and mortality. In this study we analyzed neural correlates to sympathetic arousal, as measured in terms of spontaneous skin conductance fluctuations (SCF) in patients with MD and healthy controls.

We investigated 37 patients with MD (27 females, age: 36±12y) and 37 control subjects (27 females, age: 38±12y). Skin conductance was recorded at 500Hz simultaneously to a resting functional MRI scan (3T, TR=2.5s, TE=30ms). SCF were extracted from the filtered raw signal and used to model corresponding brain activation in an event-related design.

We found no significant difference of the number of detected SCF between groups. In healthy controls, SCF were accompanied by activation mainly in the thalamus, the medial and lateral prefrontal cortex, the posterior to anterior cingulate cortex, precuneus, and the anterior insula. In MD patients, we found activations in all of these regions and additional clusters in the amygdala, the parietal operculum/posterior insula and the subgenual cortex. At the brainstem level, regions of the reticular activation system were associated to SCF occurrence in both groups. A two-sample t-test revealed increased co-activation with SCF in the parietal, temporal, occipital and posterior cingulate cortex/precuneus in MD patients when compared to controls.

Sympathetic arousal seems to be associated to activation of the salience network and the limbic system. In MD patients, increased activation in key structures of the posterior default mode network might associate SCF to depressive rumination at rest.

53) Abstract 1313

PSYCHOMETRIC PROPERTIES AND FACTORIAL STRUCTURE OF THE FRENCH VERSION OF THE CARDIAC ANXIETY QUESTIONNAIRE

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Canada, Isabelle Denis, Ph.D., Guillaume Foldes-Busque, Ph.D., Psychology, Université Laval, Québec, QC, Canada

Background: Heart-focused anxiety (HFA), defined as the fear of cardiovascular sensations and their anticipated negative consequences, is closely associated with the development and exacerbation of non-cardiac chest pain (NCCP). The Cardiac Anxiety Questionnaire (CAQ) was specifically developed to assess HFA and its manifestations. HFA was originally defined by three factors: fear of cardiovascular sensations, avoidance behaviors and heart-focused attention. However, some subsequent studies suggest the presence of a fourth factor, reassurance-seeking. The aim of this study is to assess the factor structure, reliability and validity of the French-Canadian version of the CAQ (CAQ-FR) in a sample of patients with NCCP.

Method: Patients who consulted in two emergency departments with NCCP were invited to complete a phone interview and questionnaires (CAQ-FR, Anxiety Sensitivity Index, Toronto Alexithymia Scale). Confirmatory factor analyses were used to assess the factorial structure of the CAQ-FR. Internal consistency and convergent and divergent validities of the questionnaire were evaluated with Cronbach's alpha coefficient and Pearson correlation coefficients, respectively.

Results: The final sample comprised 719 patients, with a mean age of 55 years (standard deviation = 14.97). Approximately half of them were women (52.3%). The original three-factor model (fear, attention and avoidance) did not meet the recommended alignment thresholds. Our data was best explained by a four-factor model including reassurance-seeking ($\chi^2(117) = 2.77$, $p < .001$). Deletion of three items due to low correlations improved the post adjustment indices of the model (TLI = 0.98; CFI = 0.99; RMSEA = 0.03). The internal consistency of the CAQ-FR and its subscales is good ($\alpha = 0.66 – 0.88$), and divergent and convergent validities proved satisfactory.

Conclusion: Results from this study indicate that the 15-item CAQ-FR is a valid and useful measure to assess HFA in patients with NCCP. As in previous studies, our results support the hypothesis that reassurance seeking is a relevant component of HFA and, doing so, contribute to a better understanding of this construct.

54) Abstract 1561

LIFETIME STRESS EXPOSURE, INFLAMMATION, AND DEPRESSION SEVERITY IN DEPRESSED ADOLESCENTS

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Background: Major Depressive Disorder (MDD) is characterized by pathological responses to stress. Researchers have shown that compared to healthy controls, depressed adults report higher levels of stress exposure and exhibit elevated levels of peripheral pro-inflammatory cytokines, including interleukin-6 (IL-6). Indeed, experiencing stressful events, particularly interpersonal stressors, is a potent trigger for the development of MDD. Given that first episodes of MDD often emerge during adolescence, we sought to understand the associations between stressful events and pro-inflammatory cytokines in a sample of depressed adolescents.

Methods: Seventeen adolescents (ages 13-17 years old; 5 males) diagnosed with MDD have been recruited thus far for our study. We assessed depression severity using a well-validated self-report measure of adolescent depression (Reynolds Adolescent Depression Scale, RADS) and the adolescent-version of the Stress and Adversity Inventory (STRAIN), a computerized measure of individual cumulative acute and chronic life stress that yields data on type (e.g., interpersonal), frequency, severity, and duration of stressors. Levels of peripheral cytokines, including IL-6, were estimated from dried blood spots using multiplex Luminex immunoassays. Linear regressions were used to model severity of chronic and acute stressors as predictors of RADS scores and, separately, concentrations of IL-6.

Results: After controlling for the effect of chronic interpersonal stressors, greater severity of acute interpersonal stressors was significantly associated with higher RADS scores (B=0.96±0.41; p=0.04) but not with levels of IL-6 (p>0.05). After controlling for the effect of all chronic stressors, greater severity of all acute stressors was significantly associated with lower levels of IL-6 (B=-6.63±2.90; p=0.04) and at a positive trend with higher RADS scores (B=0.60±0.32; p=0.09).

Conclusions: While greater severity of acute interpersonal stressors is a specific and unique predictor of higher levels of depression in depressed adolescents, greater severity of acute stressors across all types of stress is a unique predictor of lower levels of pro-inflammatory cytokines. Notably, because we recruited and assessed depressed adolescents, our findings are less likely to be due to the effects of prolonged illness duration or confounding medical conditions.

55) Abstract 1585

SOMATIC AND DEPRESSIVE SYMPTOMS IN ARAB AMERICAN WOMEN: THE INFLUENCE OF RELIGION ON SOCIAL AND EMOTIONAL RISK FACTORS

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Background: Arab American women are rarely studied, and the contributions of adverse experiences and emotional regulation to their health is unclear. Arab American women are religiously diverse, however, including not only Muslims but also Christians (e.g., Chaldeans), and whether risks for health problems differ between these two religions is unknown.

Methods: We recruited 123 Arab American women (ages 18 to 34) who were either Muslim (n = 68) or Christian (n = 55). We assessed somatic (PHQ-15) and depressive (Brief Symptom Inventory) symptoms, as well as five possible social and psychological contributors to symptoms: adverse life experiences (ACES), racism, alexithymia, social constraints, and cultural heritage identification.

Results: Women from the two religions did not differ on the mean level of either somatic or depressive symptoms (both $p > .54$), nor on any of the five risk factors. Regression models simultaneously entered all five factors in the prediction of both somatic and depressive symptoms. For the full (combined) sample, only alexithymia significantly ($p < .05$) predicted somatic symptoms ($\beta = .21$), and both alexithymia ($\beta = .37$) and social constraints ($\beta = .28$) predicted depressive symptoms. However, religion differences emerged in separate regression models. Somatic symptoms were predicted by racism ($\beta = .31$) but not alexithymia ($\beta = .13$) for Muslims, and by alexithymia ($\beta = .38$) but not racism ($\beta = .03$) for Christians. Depressive symptoms were predicted by ACES ($\beta = .29$), racism ($\beta = .35$), and alexithymia ($\beta = .41$) but not social constraints (B = .04) for Muslims, and by alexithymia ($\beta = .47$) and social constraints ($\beta = .46$), but not ACES ($\beta = .00$) or racism ($\beta = -.12$) for Christians.

Conclusions: Arab American women are diverse, and risk factors for somatic and depressive symptoms differ by religion. Racism and adverse childhood experiences are particularly important contributors to health problems for Muslim women, perhaps because of their double minority status in this country. In contrast, emotional regulation—but not adverse experiences—are the most powerful predictors of health problems for Christian women. Research needs to clarify the differential impact of negative experiences versus emotional regulation in understanding Arab American women's health, and recognize the importance of religious and other cultural differences.

56) Abstract 1544

INCREASED LONELINESS IN AUTISM IS LINKED TO DEPRESSION, ANXIETY AND ALEXITHYMIA, NOT AUTISM SEVERITY

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Background

Feelings of loneliness can have detrimental effects on physical and mental health. Previous studies show that rates of loneliness are higher

in autistic individuals compared to control groups. Given the negative consequences of loneliness, it is vital to understand whether higher rates of loneliness in this population are linked with autism severity or mediated through other traits. It is possible that loneliness in this population reflects feelings of 'solitude' and may not be associated with distress. In this study, we used a large sample of autistic adults to quantify the relationships between levels of loneliness, distress at being lonely, autism severity, affective symptomatology, and alexithymia.

Methods

Participants (N=62) were high functioning autistic individuals (average IQ 112 ± 7.89) between the ages of 18-64 (average age 35 ± 12.71). Self-report measures assessed autism symptoms (Autism Quotient, AQ and Empathy Quotient, EQ), state and trait anxiety severity (STAI), depression severity (PHQ-9), alexithymia (TAS-20), feelings of loneliness (UCLA Loneliness Scale), and distress about loneliness (questions added to UCLA-LS to signal distress for each item). We used Pearson's correlation to quantify the bivariate relationships between all variables.

Results

Feelings of loneliness and distress about loneliness were positively correlated with depression (r=.51, p<0.001; r=.48, p<0.001) and trait anxiety (r=.59, p<0.001; r=.68, p<0.001), but not with AQ score (r=.08, p=.52; r=-.14, p=.31) or EQ score (r=-.11; p=.41; r=.21, p=.12). Feelings of loneliness were also positively correlated with two sub-scores of our measure of alexithymia traits; Difficulty Describing Feelings (TAS-DDF; r=.29, p=.02), and Difficulty Identifying Feelings (TAS-DIF; r=.32, p=.01). In contrast, distress about loneliness was not significantly correlated with total TAS score (TAS-Total; r=.131, p=.34) or any TAS subscales.

Conclusion

Our findings indicate levels of loneliness and loneliness-distress are independent of ASC severity and are instead strongly coupled to affective symptomatology in ASC individuals. Alexithymia is associated with feelings of loneliness, but does not relate to distress at being lonely. These findings highlight the need for effective therapeutic interventions that go beyond their general levels of autism and instead focus on co-morbid diagnoses.

57) Abstract 1503

CLINICAL PROFILES OF CHILDREN WITH CO-OCCURRENT ATTENTION DEFICIT / HYPERACTIVITY DISORDER AND ANXIETY DISORDER COMPARED TO THOSE WITH ONLY ANXIETY DISORDER

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Backround: Between twenty-five and forty percent of children with an anxiety disorder (AD) present comorbid attention deficit hyperactivity disorder (ADHD). While children with comorbid AD-ADHD may present with similar symptoms and difficulties, the implications of this comorbidity remain unclear. The purpose of this study is to compare children with AD-ADHD to those with AD alone on anxiety and ADHD symptoms and behaviors associated with executive functions.

Method: Sixty-eight children aged between 8 and 12 years old were recruited at an child psychiatry outpatient clinic. Twenty-seven children (40%) had an AD and 41 children (60%) presented AD-ADHD. The Child Behavior Checklist (CBCL), CONNERS-3 and Behavior Rating Inventory of Executive Function (BRIEF) questionnaires were completed by the parents, and the Beck Youth Inventories were completed by the childrens.

Results: Children in the AD-ADHD group reported significantly more somatic complaints (t = -2,256, p = 0,030), attention problems (t = 2,421, p = 0,020) and conduct problems (t = 2.053, p = 0.048) according to the CBCL than children from the AD group. The same holds true for inattention (t = 4.489, p 0.001), learning problems (t = 4.116, p 0.001), executive functions (t = 3.329, p = 0.002) and impulsivity (t = 2.288, p = 0.029) as measured by the CONNERS-3. However, on the Beck Youth Inventories, the AD group reported more anxiety symptoms than the ADHD group (t = -2.122, p = 0.040). According to the BRIEF, the presence of ADHD was associated with elevated impairment in working memory (t = 3.625, p = 0.001), organizational capacities (t = 2.224, p = 0.031), metacognition (t = 2.595, p = 0.014) and executive capacities (t = 2.178, p = 0.037).

Conclusion: While anxiety symptoms appear to be lessened in children with AD-ADHD, they present more somatic symptoms. Furthermore, AD-ADHD is associated with increased behavioral and cognitive problems, highlighting the vulnerability of these children.

58) Abstract 1194

THE RELATION BETWEEN ACCELERATED EPIGENETIC AGE AND COGNITIVE DECLINE AMONG URBAN-DWELLING ADULTS

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Objectives. Epigenetic modifications are linked with cognitive functions and the aging process. We examined associations of three DNA methylation-based (DNA-m) measures of epigenetic age acceleration (EAA) with cross-sectional and longitudinal measures of cognitive performance in a sample of urban adults.

Methods. We used data from a subsample of respondents in the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) Study who provided DNA samples and were 50y+ of age at baseline (2004-2009) to estimate three DNA-m measures of EAA: (1) universal epigenetic age acceleration (AgeAccel); (2) intrinsic epigenetic age acceleration (IEAA); and (3) extrinsic epigenetic age acceleration (EEAA). Cognitive performance was measured at baseline visit and first follow-up (2009-2013) with 11 test scores covering global cognition and domains of attention, learning/memory, executive function, visuo-spatial/visuo-construction ability, psychomotor speed and language/verbal. We conducted a series of mixed-effects regression models adjusted for covariates and multiple testing (N=147-156 participants, ~51% men, k=1.7-1.9 observations/participant, mean follow-up time~4.7y).

Results. EEAA, which is a measure of biological age and immunosenescence was consistently associated with accelerated cognitive decline among men on tests of visual memory/visuo-constructive ability (Benton Visual Retention Test: γ_{11}=0.0512±0.0176, p=0.004) and attention (Trails A: γ_{11}=0.219±0.080, p=0.007).

Conclusions. Epigenetic age acceleration that also captures immune system cell aging was associated with faster cognitive decline among men, specifically in the domains of attention and visual memory. Further longitudinal studies are needed to replicate our findings.

59) Abstract 1550

LONG-TERM MEMORY AND WORKING MEMORY PERFORMANCE AFTER AN ACUTE STRESSOR AND ITS ASSOCIATIONS WITH SNS AND HPA AXIS ACTIVATION

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Objective: Whether stress affects memory depends on which stress pathway becomes activated and which specific memory system is involved. The activation of the SNS can lead – via indirect pathways, mediated by norepinephrine (NE) – to the stimulation of the prefrontal cortex (PFC) which is involved in higher order cognitive processes, e.g. in working memory (WM). The activation of the HPA axis leads – directly – to the binding of cortisol to receptors in the hippocampus which is involved in long-term memory (LTM). In this study, we investigated whether SNS and HPA axis activation after an acute stressor are differentially related with WM and LTM processes in healthy adults.

Methods: Thirty-three participants (mean age: 24.0 ± 5.7 years; eight male; BMI = 22.1 ± 2.8 kg/m^2) underwent the socially evaluated cold-

pressor test (SECPT). Salivary alpha-amylase (sAA), was used as a marker for SNS activation, and salivary cortisol as a marker for HPA axis activation. Saliva was collected before SECPT (t_0), immediately after (t_1), and 20 minutes after (t_2). Memory was assessed by means of word lists, each consisting of 15 neutral words. The primacy effect of the serial position curve was considered as indicator for LTM and the recency effect as estimator for WM performance.

Results: In sAA responders, defined as participants who showed an sAA increase of more than 10 percent between t_0 and t_1, WM performance increased immediately after the SECPT ($p < .001$, $\eta_p^2 = .53$). This was not found in sAA non-responders. In cortisol responders, defined as participants who showed a cortisol increase of more than 10 percent between t_0 and t_2, LTM performance decreased 20 minutes after the SECPT ($p < .001$, $\eta_p^2 = .45$). No change in LTM performance was found in cortisol non-responders.

Conclusions: We conclude that, firstly, SNS activation after an acute stressor is associated with WM, but not with LTM processes. The WM increase might be related with a stimulation of the PFC via pathways that are activated by NE. Secondly, we conclude that HPA axis activation after an acute stressor is associated with LTM processes, probably through interactions between cortisol and the hippocampus. Our findings support the view that the activation of the two stress systems activates distinct neural pathways which has independent effects on different memory systems.

60) Abstract 1758

COGNITIVE FUNCTIONING AND QUALITY OF LIFE AFTER INTIMATE PARTNER VIOLENCE RELATED HEAD INJURIES: A MULTICENTER STUDY OF ABUSED WOMEN PRESENTING AT EMERGENCY DEPARTMENTS

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Background: Head-neck-face injury has been identified as one of the most common injuries in intimate partner violence (IPV) related injuries at hospital emergency departments. However, a dearth of studies has empirically examined how the head injury may affect the cognitive functioning and quality of life of abused women. Therefore, this study aims (1) to compare cognitive functioning between abused women after head injury and those without head injury, and (2) to examine the relationship among IPV, head injury, cognitive functioning and quality of life in abused women and the mediating role of head injury and post-concussion symptoms.

Methods: We recruited 86 Chinese abused women presenting at emergency departments in four major local hospitals in Hong Kong. Their cognitive functioning was measured by the Montreal Cognitive assessment (MoCA), symptoms after head injury were assessed by the Rivermead Post-concussion Symptoms Checklist (RPSC), and quality of life was measured by the SF12v2. Socio-demographic information was also asked. The mediating relationship was examined by using structural equation modelling. Bootstrapping was performed for enhancing the normality of the sampling distribution of the total and specific indirect effects.

Results: The cognitive functioning of abused women after head injury was not significantly impaired (mean difference= .88, 95% CI= -.79 to 2.5, p=.30) when compared with that of those without head injury. However, compared with abused women without injury, those after head injury had significantly more post-concussion symptoms (mean difference=30.09, 95% CI= 25.17 to 35.00, p<0.001), as well as lower SF12v2 physical component summary (PCS) (mean difference= 2.88, 95% CI= 0.65 to 5.10, p=.012) and the mental component summary (MCS) (mean difference= -8.16, 95% CI= -13.34 to -2.98, p=0.002) scores. After adjusting for socio-demographics, the RPSC was a significant mediator of the effect of IPV on SF12v2 PCS score (RMSEA= .06, CFI = .99, p < .04) but not head injury.

Conclusions: Abused women after head injury had more post-concussion symptoms and poorer quality of life. Post-concussion symptoms, but not head injury, mediated the influence of IPV on the physical component of quality of life. Health care professionals should screen and manage post-concussion symptoms in abused women presenting in emergency departments.

61) Abstract 1588

CUMULATIVE EXPOSURE TO STRESS ACROSS THE LIFETIME IS SELECTIVELY ASSOCIATED WITH AVERSION TO ECONOMIC AMBIGUITY, BUT NOT RISK

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Background: Although stress is an inevitable part of daily life where decisions with uncertain outcomes are made, reports of stress effects on such decisions are equivocal. One reason for this may be because research has primarily focused on stress effects on risky decisions for which outcome probabilities are explicitly known. However, real-world decision contexts often involve choices for which probabilities of decision outcomes are unknown (ambiguity).

Methods: To test how real-world stressors relate to these dissociable forms of decision-making under uncertainty, we conducted two studies using a comprehensive system for assessing lifetime stressor exposure (the STRAIN) coupled with a standard economic decision-making task that independently measures risk and ambiguity preferences. In Study 1 (gain domain), participants (N=58) made 240 binary choices between a certain gain of $5 and a lottery where they could win $0 or a larger amount of money. Study 2 (N=55) was conducted in the loss domain, such that participants made 240 binary choices between a certain loss of $5 and a lottery where they could lose $0 or more money. The probability of winning was either stated explicitly (risk) or with some ambiguity. Then, we examined how the proportion of risky and ambiguous lottery choices related to lifetime stressor count and severity.

Results: Across both studies, greater lifetime stress was selectively related to ambiguity aversion but exerted no detectable influence on risk preferences. Interestingly, the directionality of this association differed depending on whether economic choices were made in the gain or loss domain. In Study 1 (gain domain), those who experienced higher lifetime stress were *less* likely to choose ambiguous lottery choices, suggesting that lifetime stress is related to a lower willingness to choose options for which the likelihood of potential outcomes is unknown. The opposite pattern emerged in Study 2 (loss domain), such that those with greater lifetime stress were *more* ambiguity tolerant, preferring ambiguous lottery choices with unknown outcome probabilities to a certain loss. No effects emerged with risky choice behavior across either study.

Conclusions: These findings suggest that lifetime stress exposure is uniquely related to individuals' willingness to choose options for which the likelihood of potential outcomes is unknown.

62) Abstract 1655

EFFECT OF EARLY INTERVENTIONS TO PREVENT THE DEVELOPMENT OF POSTTRAUMATIC STRESS DISORDER INDUCED BY MEDICAL EVENTS: A SYSTEMATIC REVIEW

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Background. Approximately one million patients develop posttraumatic stress disorder (PTSD) each year after experiencing medical events such as heart attack, stroke, cancer diagnosis, and critical illness. Little is known about whether interventions administered soon after these events can prevent PTSD. We conducted a systematic review to summarize the acceptability and efficacy of early interventions with the goal of identifying promising interventions for further development.

Method. Six biomedical electronic databases were searched for randomized controlled trials examining interventions intended to prevent medical event-induced PTSD as a primary or secondary aim. Eligible studies focused on interventions administered within 3 months of the medical event. Studies with high risk of bias were excluded. Title-and-abstract screening, full-text screening, data extraction, and risk of bias assessments were completed by two independent reviewers with consensus reached at each stage.

Results. Of 3,993 screened studies, the 17 included studies examined interventions for patients (sample size range: 28 - 353) with cancer diagnosis (7), critical illness (7), or a cardiac-related event (3). Intervention types were heterogeneous: cognitive behavioral therapy (CBT; 4); other psychological therapies with CBT components (4); social support, positive meaning-making, and/or coping advice (4); altered medical management or environmental restructuring (4); and pharmacological intervention (hydrocortisone; 1). A majority of eligible patients agreed to be enrolled into the trials (70%, range: 40.8%-96.9%). Five studies showed evidence for efficacy of reducing PTSD symptoms: group CBT after cancer diagnosis (standardized effect size [ES] = 0.43); one-on-one CBT (ES = 0.29) and stress-dose hydrocortisone (ES = 1.08) after cardiac events; and advice via rehabilitation workbook (ES = 0.43) and receipt of an ICU diary (ES = 0.87 [for PTSD incidence]) after critical illness.

Conclusion. There is weak to moderate strength of evidence from small RCTs that preventing PTSD symptoms due to life-threatening medical events may be possible. The most promising interventions were CBT, hydrocortisone administration, and ICU diary. Future studies should aim to optimize interventions for later stages of development.

63) Abstract 1175

PTSD IS ASSOCIATED WITH A GENOMIC AND PROTEOMIC SIGNATURE OF INFLAMMATORY IMBALANCE AMONG WOMEN EXPOSED TO INTERPERSONAL VIOLENCE

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Background: PTSD is linked with alterations in inflammation and innate immunity. However, trauma exposure impacts many genes, yielding a complex genomic expression signature, which may exhibit some specificity toward exposure to interpersonal violence (IPV). Advancing translational research requires a "molecular allostatic load" index validated specifically for IPV. The M1/M2-like polarization ratio may capture a disequilibrium of pro-inflammatory versus pro-resolving genes, with implications for IPV-related PTSD.

Hypotheses: Among a diverse, low-income cohort of women exposed to IPV, greater PTSD symptoms will be associated with 1) greater M1/M2 imbalance, 2) higher pro-inflammatory cytokines, and 3) lower anti-inflammatory cytokines.

Methods: At baseline, we assessed PTSD symptoms among 53 women exposed to IPV. Blood was drawn and serum assayed for: 1) average pro-inflammatory, predominantly M1-associated proteins (TNF-a, IL-1ß, IL-6, IL-12, IL-18, CRP, IFN-y), and 2) anti-inflammatory, M2-associated cytokines (IL-1ra, IL-4, IL-10), each quantified as an aggregate. CD14+ monocytes were isolated and gene expression assayed by RNA sequencing (Illumina HiSeq 4000 with TruSeq cDNA library preparation.)

Results: Greater PTSD symptoms were associated with significantly greater M1/M2 polarization (r=.307, p=.045), no differences in pro-inflammatory cytokines (r=-.134, p=.339), and significantly lower anti-inflammatory cytokines (r=-.417, p=.002). M1/M2 polarization was marginally associated with lower anti-inflammatory (r=-.285, p=.058), but not pro-inflammatory cytokines (r=-.218, p=.151). This pattern remained similar adjusting for age, ethnicity, and BMI; however, when adjusting for antidepressant use, PTSD symptoms remained significantly and independently associated only with lower anti-inflammatory cytokines.

Conclusions: In women exposed to interpersonal violence, PTSD symptoms were associated with lower pro-resolving/anti-inflammatory cytokines, and, in unadjusted analyses, with an altered gene expression signature of inflammatory imbalance. Future research should investigate whether the *inability to resolve inflammation*, as opposed to excessive pro-inflammatory cytokine secretion per se, underlies poor resolution of stress-related chronic inflammation and related symptomatology in PTSD among women exposed to IPV.

64) Abstract 1804

PTSD, PRESCRIPTION OPIOID USE AND RISK OF CARDIOVASCULAR DISEASE

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Background: Several studies have reported prescription opioid analgesic use (OAU) is associated with incident cardiovascular disease (CVD) and a large literature suggests PTSD is an independent risk factor for CVD. Because patients with PTSD and pain are more likely to have OAU and receive prescriptions for longer duration and higher doses, it is possible that this population is at additional risk of CVD due to combined exposure to PTSD and OAU. **Methods:** Data were obtained from 5,978 patients who used one of five Veteran Health Affairs medical centers distributed across the United States between 2008-2012. Follow-up ended in 2015. Medical records were used to create study variables. Patients were eligible for analysis if they were 30-70 years of age, free of prevalent OAU and CVD for one year prior to index date. Patients with PTSD must have had 2 visits with a diagnosis for PTSD and the index date was the second visit. Non-PTSD controls index date was the second visit for any reason. Cox proportional hazard models were computed to measure the association between a four level variable (PTSD and OAU vs. PTSD alone vs. OAU alone vs. neither) and incident CVD. Confounding variables were modeled as time dependent and measured up to the time of OAU or until end of follow-up for those who remained non-OAU. **Results:** Patients were on average 50 (±11.1) years of age, 86.7% were male and 59.9% were white. During follow-up 22.5% had

PTSD and OAU, 11.9% had OAU only, 32.6% PTSD only and 33.0% neither. Results of fully adjusted models indicated that compared to having neither exposure, PTSD and OAU was significantly associated with incident CVD (HR=2.19; 95%CI:1.64-2.93), OAU only was significantly associated with incident CVD (HR=2.17; 95%CI:1.57-3.00) and PTSD only was not associated with incident CVD (HR=0.79; 95%CI:0.63-1.10). There was no significant interaction or additive effects.

NOTE - additional analysis removing cancer pain patients are still underway

Conclusions: The present results suggest OAU has a strong association with incident CVD. Although PTSD and OAU had no additive association with incident CVD, the high prevalence of OAU in patients with PTSD may still contribute to the high burden of CVD in this patient population.

65) Abstract 1513

DEVELOPING A PARSIMONIOUS SCREENING TOOL FOR IDENTIFYING PATIENTS AT-RISK FOR PTSD FOLLOWING ACUTE CORONARY SYNDROME

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Introduction:

Approximately 12% of ACS survivors develop PTSD. ACS-induced PTSD is associated with poorer prognosis, including a doubling of the risk of ACS recurrence, hospital readmission, and mortality. Although risk factors for ACS-induced PTSD have been extensively studied, these findings have not yet been translated into a screening tool for use in the acute post-ACS setting. We sought to develop a parsimonious, yet discriminative, screening tool that could be used to identify patients at risk for PTSD to be targeted for early intervention.

Methods:

615 patients evaluated for suspected ACS were screened for PTSD risk factors within 7 days of the cardiac event. PTSD symptoms related to the event were assessed 1 month later. A multivariate logistic regression model was developed to identify those patients with elevated PTSD symptoms (PCL-S>33) at 1 month. Model predictors were selected from measures collected within days of hospitalization: demographics; trauma history(LEC-5); depressive symptoms(PHQ-8); PTSD symptoms due to a prior trauma(PCL-S); acute stress disorder symptoms related to the cardiac event(ASDS); social support and spiritual coping (SSRS,RCOPE); ED experience; medical history and hospital course. Candidate models were identified using stepwise and best subset regression against bootstrap samples. A final model was selected that maximized the goodness-of-fit (BIC) and discriminatory power. Bootstrapping was used to internally validate the model, assess overfitting, and estimate confidence intervals.

Results:

A parsimonious model for predicting PTSD symptoms at 1 month post-ACS evaluation was identified that relies on only 5 questions administered within a week of a suspected ACS. 4 of the 5 questions were drawn from standard screening instruments(PCL-S, ASDS, PHQ-8) and the last question measures recalled fear while in the ED (Table). The discriminatory power (AUC=0.84,95% CI:0.79-0.88) outperformed the PCL-S (AUC=0.72) and ASDS (AUC=0.78) (p-value<0.01,Figure). Bootstrap validation (AUC=0.83) suggests minimal overfitting. Comparing the Youden indices, the 5-item model showed an increase in sensitivity and specificity of 5% (68%=>73%) and 12% (72%=>84%), respectively, over the PCL-S.

Conclusion: A 5-item parsimonious model may be superior to existing instruments for identifying post-ACS patients who may benefit from early PTSD interventions.

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66) Abstract 1037

A PARSIMONIOUS SCREENING TOOL FOR IDENTIFYING PATIENTS AT-RISK FOR DEVELOPING DEPRESSION FOLLOWING ACUTE CORONARY SYNDROME: LIMITING THE RISK OF UNDER AND OVERTREATMENT

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Introduction:

Depressive symptoms are common following acute coronary syndrome (ACS) and even mild depressive symptoms are associated with an increased risk for ACS recurrence and mortality. Experts have recommended depression screening during ACS hospitalization and intervention for at risk patients. However, depressive symptoms commonly spontaneously remit after discharge and early screening with standard instruments has shown poor sensitivity and specificity for identifying elevated depressive symptoms 1 month after discharge. Consequently, a significant proportion of patients who initially screen positive are at risk of unnecessary treatment and patients who initially screen negative and later develop elevated depressive symptoms are at risk of not receiving early treatment.

Methods:

1087 ACS survivors were screened for depressive symptoms within 7 days of the ACS event and then 1 month later. A multivariate logistic regression model was developed to identify patients with at least mildly elevated depressive symptoms (PHQ-9>4) at 1 month. Model predictors were selected from data collected during ACS hospitalization: responses to depression and anxiety instruments (PHQ-9,BDI-I,HADS); measures of function and social support (SF-12,anergia scale,ESSI); medical history and hospital course. Candidate models were identified using stepwise and best subset regression against bootstrap samples. A final model was selected that maximized the goodness-of-fit (BIC) and discriminatory power. Bootstrapping was used to internally validate the model, assess overfitting, and estimate confidence intervals.

Results:

A parsimonious model for predicting at least mild depressive symptoms at 1 month post-ACS was identified using data collected during hospitalization. It relies on 5 predictor questions drawn from standard screening instruments: PHQ-9, HADS, and SF-12 (Table). The discriminatory power (AUC=0.85, 95% CI:0.81-0.88) outperformed the PHQ-2, PHQ-9, and BDI-I (p-value<0.001; Figure). Bootstrap validation (AUC=0.84) suggests minimal overfitting. Using the 5-item model instead of the PHQ-9 to guide early intervention yields a reduction in overtreated and undertreated patients of up to 36.7% and 38.5% respectively.

Conclusion: A 5-item parsimonious model may be superior to existing instruments for identifying post-ACS patients who may benefit from early depression treatment.

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67) Abstract 1620

DIURNAL CORTISOL INDICATORS FOLLOWING CARDIAC REHABILITATION: LONGITUDINAL EVIDENCE FROM THE CREATE STUDY

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Background

Following a serious heart event, individuals are often referred to cardiac rehabilitation (CR) to facilitate lifestyle changes to improve cardiovascular health and stress management. This study examined whether diurnal cortisol patterns—considered important predictors of cardiovascular outcomes—were sensitive to change in the 15 months following CR initiation and identified predictors of change.

Methods

Data came from the longitudinal Cardiac Rehabilitation and the Experience study, which followed individuals during and 12 months post-CR. Analysis was restricted to participants who provided salivary cortisol (4 samples/day at waking, 30 and 120 minutes post-waking, and before bed) (*N*=94, mean age=63). Multiple indicators of diurnal cortisol patterns were examined: cortisol awakening response (CAR), immediate (IS) and late-day (LS) declining cortisol slopes, and area under the curve (AUC). Multilevel linear regression was used to examine change in indicators over time, and demographic and behavioral correlates of change.

Results

Demographic characteristics were unrelated to diurnal cortisol indicators except for age, which was associated with larger AUC (β=.01, SE=.004, *p*=.020). CAR, IS, LS, and AUC did not change over time prior to and after adjusting for demographics (βs 0±.01, *p*-values>.2). Health behaviors pre/post-CR that were unrelated to diurnal cortisol indicators and trajectories included poor diet, prayer, alcohol abuse, and drug use. Smoking was associated with indicators of increased cardiovascular risk (e.g., blunted IS, β=.30, SE=.09, *p*<.001), though smokers demonstrated CAR improvements post-CR (β=.29, SE=.14, *p*=.045). Being physically active post-CR was associated with a steeper LS (β=-.01, SE=.01, *p*=.028), but relationships between physical activity and cortisol indicators over time were mixed. Pre-CR meditation was associated with blunted LS (β=.02, SE=.01, *p*=.027), but meditation post-CR was associated with steepening LS over time (β=-.01, SE=.003, *p*=.036).

Conclusions

This study adds to the ongoing discussion of whether, and, if so, how quickly, diurnal cortisol patterns change, particularly during a life course stage when major health events become more prevalent. There is suggestive evidence that some health behaviors may be linked to cortisol changes over time, although its clinical significance remains to be established.

68) Abstract 1500

CROSS-SECTIONAL RELATIONSHIPS BETWEEN OPTIMISM AND MEDICATION ADHERENCE IN PATIENTS WITH MODERATE TO SEVERE HEART FAILURE.

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Background: Among patients with heart failure (HF), medication adherence is associated with improved health outcomes. Despite these benefits, many patients with HF struggle to adhere to pharmacotherapy. Optimism is prospectively associated with health behavior adherence and cardiovascular health (including mortality), but the relationship between optimism and medication adherence has not been studied in HF. We aimed to examine the cross-sectional relationship between optimism and medication adherence in patients with moderate to severe HF.

Methods: We performed a secondary analysis of baseline data from the clinical trial "Hopeful Heart," which examines two collaborative care interventions for patients with HF and depression. Participants with HF were recruited during hospitalization with confirmed ejection fraction of ≤ 45%, New York Heart Association class II-IV, positive PHQ-2 screen (PHQ-2 ≥ 1) and confirmed depressive symptoms 2 weeks post-discharge (PHQ-9 ≥ 10; N=629). A non-depressed convenience sample (PHQ-2=0 and PHQ-9 < 5; N=127) was also included. Optimism was measured using the Life Orientation Test-Revised (LOT-R), and health behavior adherence by a single-item question about medication adherence. Chi-square and logistic regression analyses were performed to examine the relationship between optimism and medication adherence.

Results: Compared to pessimists (lowest quartile of optimism), optimists (highest quartile) were significantly more likely to report adequate levels of medication adherence (89.7% vs. 76.5%, p=.001). However, when controlling for HF-related quality of life, mental health-related quality of life, and depressive symptoms, this relationship was attenuated (adjusted odds ratio=1.607, p=.20).

Conclusions: While optimism is associated with significantly greater adherence to medications among patients with HF, this relationship is explained—at least in part—by depressive symptoms and quality of life. Prospective studies to examine the relationship between optimism and medication adherence will be helpful to clarify its utility as a target for health behavior interventions.

69) Abstract 1208

HSCRP IS ASSOCIATED WITH IMPAIRED PHYSICAL BUT NOT MENTAL HEALTH-RELATED QUALITY OF LIFE IN DEPRESSED PATIENTS WITH CAD - RESULTS OF THE SPIRR-CAD TRIAL

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Background: High sensitivity C-reactive protein (HsCRP) is commonly used as a biomarker of systemic inflammation and has been associated with the progression of coronary artery disease (CAD). Both chronic inflammation and CAD are related to decreased health-related quality of life (HRQoL) and depression. Associations of CRP and HRQoL were found in multiple samples including healthy older adults and patients with metabolic syndrome, diabetes, or depression.

Methods: We aimed at assessing the relation of HsCRP and HRQoL in a sample of 510 patients who were mildly to moderately depressed (Hospital Anxiety and Depression Scale ≥ 8) and had stable CAD. Patients were part of the multicenter Stepwise Psychotherapy Intervention for Reducing Risk in Coronary Artery Disease (SPIRR-CAD) trial. Physical and mental HRQoL was assessed using the Short Form Health Survey (SF-36) with its eight domains, i.e., vitality, physical functioning, bodily pain, physical role functioning, general health perceptions, social role functioning, emotional role functioning, and mental health and its two component scores (physical and mental health). HsCRP was log-transformed to approach normal distribution. Separate linear regression models were calculated for all subscales of SF-36 as dependent variable and log(HsCRP) as independent variable. The models were adjusted for age, sex, body mass index, statins, and nonsteroidal anti-inflammatory drugs.

Results: The results revealed log(HsCRP) as a significant independent predictor of the patients' self-rated physical functioning ($\beta = -.261$, $p < .001$), physical role functioning ($\beta = -.147$, $p = .002$), vitality ($\beta = -.137$, $p = .002$), social role functioning ($\beta = -.106$, $p = .020$), bodily pain ($\beta = -.148$, $p = .001$; higher score = less pain), and the physical component score ($\beta = -.203$, $p < .001$). Log(HsCRP) was not associated with general health perceptions, emotional role functioning, or mental health in this sample. The

relation between HsCRP and HRQoL was independent of anti-inflammatory medication.
Conclusions: The results indicate that high levels of HsCRP are associated with decreased physical HRQoL and less social role functioning, but not with the patients' mental health or emotional role functioning. The results are in line with previous studies in different samples. The cross-sectional study design cannot determine causal effects.

70) Abstract 1601
FACIAL EXPRESSIONS OF EMOTIONS DURING EXERCISE STRESS TESTING IN PATIENTS WITH SUSPECTED MYOCARDIAL ISCHEMIA: THE HEART INSIDE OUT (THIO) STUDY.
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Background: Physiological and psychological factors, such as emotions, are implicated in the pathophysiology of myocardial ischemia. Negative emotions have been linked to myocardial ischemia, but are mostly assessed using self-report. In this study, negative emotions are analyzed using facial recognition software among patients receiving exercise stress testing (EST) to detect ischemia. We aim to examine changes in emotions during EST, and investigate differences in negative emotions in patients with versus without inducible ischemia.
Methods: In total 208 patients (mean age 67±9 yr., 44% women) referred for a myocardial perfusion scan between January 2017 and May 2018 were included. Patients were filmed during EST, which was divided into four consecutive time blocks: baseline, exertion, maximal exertion, and recovery. Images were analyzed using facial recognition software, resulting in percentages of expressed negative emotions in each time-block. Medical records were retrieved for the presence of ischemia. Mixed repeated measures ANOVA's were performed to examine the changes in negative emotions anger, disgust, sadness, and scared, over time during the EST as within-subjects factor, and presence/absence of ischemia as between-subjects factor.
Results: The negative emotions disgust, sadness, and scared changed significantly over the four time-blocks during EST (Disgust $F(2.4, 385.1)= 6.72$, $p= .001$; Sadness $F(2.6, 412.3)= 5.46$, $p= .002$; Scared $F(2.6, 408.4)= 7.02$, $p= .0003$), with sadness showing the highest percentages during stress-testing. Ischemia was present in 31% (65) of patients, with men (21%) presenting with more ischemia than women (11% ; $X^2= 5.10$, $p = .024$). No significant differences for presence/absence of ischemia were observed for these negative emotions. Findings on reported complaints during the EST are being examined.
Conclusion: Analyses show that negative emotions significantly changed during EST when using objective facial recognition software, with sadness being most prevalently expressed. Percentages of expressed emotions were not markedly different between patients with compared to those without ischemia.

71) Abstract 1532
DOES PATIENT EDUCATION INFLUENCE KNOWLEDGE, ATTITUDES, AND EXERCISE PARTICIPATION AMONG CORONARY ARTERY DISEASE PATIENTS ATTENDING CARDIAC REHABILITATION?
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Background: Patient education (PE) is a core component of cardiac rehabilitation (CR), the gold standard in tertiary prevention of coronary artery disease (CAD). CR contributes to reduced mortality and rehospitalizations, but these benefits depend on regular attendance at exercise sessions. PE may increase CAD knowledge and potentially promote CR adherence, yet few curricula have been empirically validated in CR. It remains equivocal whether PE can help CAD patients translate disease-related knowledge into improved attitudes toward CR and enhanced program participation.
Aims: To evaluate the impact of a CR-based PE curriculum on: 1) CAD knowledge, 2) attitudes toward CR, and 3) CR exercise adherence.
Methods: Nineteen patients with CAD scheduled to attend four 2-hour, group-based PE classes at the beginning of a 12-week CR program participated in the study. PE was delivered by a multi-disciplinary team of providers and covered cardiac physiology, risk factors, medications, nutrition, exercise, and stress management. Pre- and post-PE, patients completed validated measures of CAD knowledge assessed across 5 domains (medical condition, risk factors, exercise, nutrition, and psychosocial risk) and attitudes about CR across 4 domains (perceived necessity, exercise concerns, barriers, perceived suitability). Follow-up (12-week) data collection is ongoing. CAD knowledge, CR attitudes, and # of exercise sessions attended/24 (determined by chart review) will be re-assessed 12-weeks post-PE.
Results: Prior to PE, 1-in-2 patients scored <80% on the CAD knowledge questionnaire (M=15.16/20.00, SD=2.24). Pre-PE knowledge was highest in the risk factors domain (M=3.58/5.00, SD=.61) and lowest in the psychosocial risk domain (M=2.95/5.00, SD=.78). Post-PE, average knowledge scores increased (M=17.05/20.00, SD=1.03), $t(18) = -3.34$, $p=.004$. CR attitudes improved from pre- (M=25.53/65.00, SD=5.52) to post-PE (M=22.58/65.00, SD=5.63), $t(18)=2.66$, $p = .016$. Domain-specific CAD knowledge increased for medical condition, risk factors, nutrition, and exercise (p's $< .05$). Change in psychosocial risk knowledge was non-significant although there was a trend towards improvement ($p=.130$).
Conclusions: PE was associated with increased CAD knowledge and more positive attitudes toward CR. This research will help inform optimal delivery of PE as a means to enhance CAD self-management and CR adherence.

72) Abstract 1149
A NETWORK ANALYSIS OF DEPRESSION AND HEALTH BEHAVIORS IN PATIENTS WITH CORONARY HEART DISEASE, THE THORESCI STUDY
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Background: Depression imposes a heavy additional burden on patients with heart disease. Symptoms of depression are not only debillitatng themselves, they may also affect health behaviors, ultimately adversely affecting cardiovascular prognosis. In the current study, we used network analysis to explore the interrelations between individual depressive symptoms and recommended adherence behaviors in a sample of patients with coronary artery disease (CAD).
Aim: We aimed to determine the symptom network of depression and health behaviors at baseline, right after percutaneous coronary intervention (PCI) for an obstructed coronary artery (T1), and six months later, when cardiac rehabilitation had finished (T2).
Methods: A total of 1079 acute (45%) or elective (55%) patients with CAD (age=66.3±10.7, 78% male) reported on depressive symptoms (PHQ-9) and adherence behaviors (MOS-adherence) at 1 and 6 months post-PCI.
Results: Overall, at both time points, depressive symptoms were more strongly connected with each other than specific adherence behaviors. Consistent with the DSM-5, we found that depressed mood, thoughts

of death, fatigue, and guilt were the most central symptoms of depression. The relationships between depressive symptoms and adherence behaviors were mostly negative in direction and relatively weak. Specifically, there were consistent and negative bridges between respectively eating problems and depressed mood with regular exercise, between guilt and socializing, and between thoughts of death and medication adherence, and finally, at T1, between loss of interest and cardiac rehabilitation participation.
Conclusion: Results led us to 3 major conclusions: 1) the network of depression in CAD patients was comparable to the major depression symptoms network observed in psychiatric patients with MDD, and similar across time; 2) Adherence behaviors did little for depressive symptomatology and vice versa; and, 3) Bridges between specific depressive symptoms and specific adherence behaviors were found, that may inform future research examining causality.

73) Abstract 1244
APPLYING COGNITIVE APPRAISAL TO HEART FAILURE: SELF-EFFICACY MODERATES THE RELATIONSHIP BETWEEN BELIEFS OF ILLNESS THREAT AND DEPRESSION
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Background: Depression is common among heart failure (HF) patients (Gottlieb, et al., 2004). The diagnosis and implications of HF may cause distress that progresses into clinical depression, which may be explained by cognitive appraisal theories of stress and coping (Folkman, et al., 1986). Stressors are evaluated in terms of what is at stake (primary appraisal) and coping options (secondary appraisal). If a stressor is appraised as a threat to health and as exceeding one's ability to cope, then distress such as depression may result. It was hypothesized that beliefs that HF is threatening would be positively related to depression and that self-efficacy for managing HF might moderate this relationship.
Methods: Participants were 244 HF patients (65.6% male, 71.7% Caucasian, mean age = 68.75). Perception of HF as threatening was measured with a subscale of the Survey of Illness Beliefs in Heart Failure, self-efficacy was measured with the self-efficacy subscale of the Kansas City Cardiomyopathy Questionnaire, and depression was measured with the Patient Health Questionnaire-9. Moderation analyses were used to assess main effects and interactions of threatening beliefs and self-efficacy on depression after controlling for HF classification, sex, education, and race.
Results: The overall model accounted for 20.7% of the variance in depression ($p < .001$). A positive main effect was found for threatening beliefs (B = .549, $p = .004$) and a negative effect was found for self-efficacy (B = -.067, $p = .025$). A significant interaction effect was also demonstrated ($p = .033$). Simple slopes analysis revealed that threatening beliefs were significantly associated with depression when self-efficacy levels were low ($p = .002$) or moderate ($p = .004$), but not when self-efficacy levels were high ($p = .212$).
Conclusions: The present study applied the cognitive appraisal theory of stress and coping to the chronic stressor of HF, assessed whether perceptions of threat were related to depression symptoms, and evaluated whether this relationship is moderated by self-efficacy. Results supported hypotheses; a positive relationship was found between threatening beliefs and depression, and self-efficacy moderated the relationship. Clinical implications of the present study suggest that interventions that bolster self-efficacy may be effective in preventing or treating depression in HF.

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74) Abstract 1021
CHARACTERIZING CHANGES IN DISEASE-RELATED STRESS AMONG ADOLESCENTS AND YOUNG ADULTS WITH CONGENITAL HEART DISEASE
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Background: Congenital heart disease (CHD) survivors vary widely in daily impact of their disease, which may worsen as they age. As a consequence, disease-related stress may also increase, though this has not been documented. The aim of the current study is to characterize changes in disease-related stress among adolescents and young adults with CHD over a three-year period. **Methods:** Participants included 31 adolescent (M=15.87±0.85, range=15-17) and 148 young adult (M=27.87±6.24, range=18-39) CHD survivors recruited from outpatient cardiology clinics at two large Midwestern hospitals. Participants completed the Responses to Stress Questionnaire at two time points: baseline (T1) and three-year follow-up (T2). The questionnaire begins with 13 items adapted for CHD that orient respondents to possible disease-related stressors. As indicators of disease severity, the number of cardiac medications, hospitalizations, and New York Heart Association (NYHA) functional class were abstracted from medical records. To examine change in disease-related stress and disease severity, paired sample t-tests were conducted on the total stress score, number of cardiac medications, and number of hospitalizations, while the McNemar test examined change in NYHA class. **Results:** Those who were adolescents at T1, but not young adults, exhibited a significant increase in disease-related stress (M_{T1} = 18.7, M_{T2} = 21.6, t[28]=-2.29, p=0.03) and a decrease in the number of cardiac medications used (M_{T1} = 0.93, M_{T2} = 0.64, t[44]=2.23, p=0.03). No changes were found for hospitalizations or NYHA class. Adolescents rated two items as more stressful at T2 than T1: concerns about future medical procedures (somewhat/very stressful at T1: 20.4% vs. T2: 35.5%) and paying for healthcare (somewhat/very stressful at T1: 6.6% vs. T2: 22.6%). The two items most endorsed as somewhat/very stressful by adolescents were concerns about having children in the future (T2: 45.2%) and concerns about future medical procedures (T2: 35.5%). **Conclusions:**Results suggest that adolescent CHD survivors transitioning into emerging adulthood may become more cognizant about the ramifications of their condition, which as a consequence, increases disease-related stress. Emerging adulthood may be an ideal developmental period to screen CHD survivors for disease-related stress to provide appropriate resources.

75) Abstract 1751
SLEEP, SYMPTOM SEVERITY, AND INFLAMMATION IN HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION
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Background: Sleep disturbance is common in heart failure (HF) and associated with more severe HF symptoms. In healthy adults, sleep disturbance is associated with increased inflammation, yet less is known about relationships among sleep, inflammation, and symptom severity in HF. This study evaluated relationships of self-reported indices of sleep to changes in inflammation and symptoms in HF. **Methods:** Plasma biomarkers interleukin-6 (IL-6) and c-reactive protein (CRP) were measured in 30 HF patients with reduced EF (63% men; M_{age}=59.4 ± 10.3 yrs) at baseline and 3 months later. Patients completed measures of sleep quality (Pittsburgh Sleep Quality Index; PSQI) and HF symptoms (Kansas City Cardiomyopathy Questionnaire Clinical Summary; KCCQ). Bivariate and partial correlations were used to examine relationships of levels and changes in PSQI (total sleep quality, sleep duration) to HF biomarkers and to KCCQ scores. **Results:** IL-6 (M_{base}=6.1 pg/mL±5.6 and M_{3month}=5.9 pg/mL±5.3) and CRP values (M_{base}=7.3 mg/L±9.0 and M_{3month}=7.8 mg/L±8.3) were clinically elevated and the majority (63% at baseline

and 53% at 3 months) of patients reported poor overall sleep (PSQI total score>5). At baseline, higher IL-6 was associated with shorter sleep duration (r=.48, p=.01), poorer sleep quality (r=.37, p=.045), and worse HF symptoms (r=-.43, p=.02) and worse HF symptoms were correlated with poorer sleep quality (r=-.57,p=.001) and shorter duration (r=-.39, p=.04). Controlling for HF symptoms, IL-6 was no longer associated with sleep quality or duration at baseine. CRP was not related to sleep or HF symptoms at baseline, and neither IL-6 nor CRP were associated with sleep or HF symptoms at 3 months. Change in sleep quality from baseline to 3 months, however, was associated with corresponding changes in IL-6 (r=.38, p=.047) and HF symptoms (r=.44, p=.02), but there was no association between changes in IL-6 and HF symptoms. Relationships between changes in IL-6 and sleep also became nonsignificant after controlling for KCCQ change. **Conclusions**: In HF, poor sleep quality, shorter sleep duration, and worse HF symptoms are associated with increased circulating levels of IL-6, and changes in sleep quality are associated with IL-6 changes. These changes are in part attributable to worsened HF symptoms since there is a high degree of overlap between sleep and other HF symptoms.

76) Abstract 1744

INVESTIGATING THE ASSOCIATION OF NEIGHBORHOOD WALKABILITY WITH RISK FACTORS FOR CARDIOVASCULAR DISEASE AMONG RECENTLY HOSPITALIZED PATIENTS WITH SYSTOLIC HEART FAILURE.

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Background: Neighborhood walkability has been associated with the risk of cardiovascular disease (CVD) in healthy community samples; however, few studies involved medically ill populations. We investigated the relationship between neighborhood walkability and several risk factors for CVD and mood symptoms among a cohort of recently hospitalized patients with systolic heart failure (HF) who consented to enroll into a clinical trial.

Methods: From March 2014 to Oct 2017, we screened hospitalized patients with systolic HF (ejection fraction (EF) ≤45%) and NYHA class II-IV symptoms for depression at 8 Pittsburgh-area hospitals. Two weeks after discharge, we telephoned consented patients to confirm protocol-eligibility, administer our baseline assessment battery and conduct a detailed chart review. We obtained the WalkScore™ for each patient's address that classified their neighborhood's walkability on a 0-100 scale based on routes to schools, parks, food markets, and other retail (https://www.walkscore.com/professional/research.php), and further categorized these scores into four separate 25-point WalkScore™ categories: Very Car-Dependent, Car-Dependent, Somewhat Walkable, and Very Walkable. We then assessed the relationship between each category and NYHA class, EF, BMI, PHQ-9, medication count, and co-morbidity adjusting for age, gender, race, and marital status.

Results: Among our 756 HF patients (mean age: 66±13, 44% female, 74% White, mean BMI 32.6±9.3, median WalkScore 32[8,53]), living in a car-dependent neighborhood was associated with older age (p=0.006), White race (<0.001) and marital status(p<0.001), but not diabetes (mean A1C 8.4±4.6), hypertension, hyperlipidemia, total number of comorbidities, BMI, or mood symptoms (PHQ-9). Unexpectedly, systolic blood pressure was highest in the Very Walkable group (systolic:133±21) vs. Very Car-Dependent (122±19) (p<0.001) even after adjustment for age, race, and marital status.

Conclusions: While increased neighborhood walkability has been associated with reduced risk of CVD in relatively healthy populations, this association may be attenuated in HF patients who may be unable to take advantage of neighborhood walkability. Further analyses are needed to better understand why blood pressure control was worse in more walkable areas and the prognostic potential of neighborhood walkability for HF morbidity.

77) Abstract 1225

FIBRINOGEN AND TYPE D IN DEPRESSED CORONARY ARTERY DISEASE PATIENTS - A SECONDARY ANALYSIS FROM THE SPIRR CAD TRIAL

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Introduction: Depression and Type D personality have been associated with increased cardiac morbidity and mortality. A proinflammatory and procoagulative state as mirrored by fibrinogen potentially mediates the pathophysiological risk of increased atherosclerosis. The German multicenter SPIRR-CAD trial found that only Type D patients showed a benefit from an 18-months individual and group intervention regarding reduction of depression. We therefore hypothesized a decrease of fibrinogen levels in Type D patients.

Methods: We analyzed plasma fibrinogen levels (g/l) in 180 patients with stable coronary artery disease (CAD) and moderate levels of depression (HADS depression scores ≥8) from the SPIRR-CAD trial. A repeated measures ANOVA was performed: 2 time points (before and after 18 months of intervention), 2 groups (Type D versus non Type D), fibrinogen as dependent variable. Age, sex, and randomisation arm (intervention versus standard clinical care) were entered as covariates.

Results: In 180 of the 570 SPIRR-CAD patients complete fibrinogen data were available (61.5±7.7 yrs; N=57 female; N=106 Type D). Repeated measures ANOVA yielded a significant time effect (F[df1]=7.111;p=.008), referring to a decrease of fibrinogen levels from baseline to 18 months. There was a significant time by group interaction (F[df1]=6.733;p=.010) referring to a decrease of fibrinogen in the Type D patients (from 3.70±1.0 to 3.29±0.91 g/l) versus no significant change in the non Type D patients (3.47±1.12 to 3.46±1.0 g/l). When adding randomisation arm, sex, and age as covariates, the significant interaction of time and Type D remained significant (p=.014). Group effects were all non significant (p>0.1). However, there was a marginally significant interaction of time by sex (p=.065) referring to a more pronounced decrease in the men.

Conclusion: Parallel to a differential benefit from an 18-months group psychotherapy intervention regarding reduction of depression levels, moderately depressed Type D patients with CAD showed a reduction of plasma fibrinogen levels versus absence of significant changes in the non Type D patients. Our hypothesis of parallel improvement of psychological and biomarker profile mirroring subclinical inflammation and/or a procoagulable state may hereafter be seen as confirmed. Sex related aspects need to be further analyzed.

78) Abstract 1295

EXISTENTIAL PROTECTIVE AND RISK FACTORS FOR PATIENTS WITH ADVANCED HEART FAILURE: HOW THE PRESENCE OF, AND THE SEARCH FOR, MEANING INFLUENCES HEALTH-RELATED QUALITY OF LIFE AND PSYCHOLOGICAL DISTRESS.

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Background: Presence of meaning in life has been associated with better physical and mental health outcomes. Although presence of meaning in life has well documented positive relationships with well-being, the construct of searching for meaning has been related to negative affect, depression, and neuroticism. This study sought to examine the relationships among presence of meaning, search for meaning, and psychological distress among a sample of individuals with heart failure (HF). Methods: Participants with advanced HF (N = 71) were recruited via Qualtrics Panels and completed online questionnaires regarding meaning in life, existential factors, and psychological distress. Results: The degree of presence of meaning (*M*= 24.45, *SD*= 6.70) and search for meaning (*M*= 22.51, *SD*= 7.85) were similar. There was significant moderation between search for meaning and presence of meaning with depression, $b_{interaction}$= -.02,$SE_{interaction}$= 0.01, $b_{interaction}$= -.30, p< .01, and with health-related quality of life (HR-QOL),$b_{interaction}$= -.12,$SE_{interaction}$= 0.05, $b_{interaction}$= -.25, p< .05. Individuals with greater search for meaning reported more depressive symptoms and poorer HR-QOL, but only if there was a lack of presence of meaning in life. Therefore, those who were actively searching for meaning and lacked presence of it tended to have more psychosocial distress. Individuals with more meaning presence in their life reported lower depression and better HR-QOL, regardless of their level of searching for meaning. Conclusions: These results indicate that the act of searching for meaning in life should be understood within the context of an already existing meaning framework and not as an independent factor regarding depression and HR-QOL. Actively searching for meaning may be common among patients for whom mortality is salient due to a progressive illness, yet it appears that this only becomes possibly deleterious for those relatively lacking life meaning. Searching for meaning in individuals who already feel their life is meaningful can lead to a healthy accommodation to illness, but searching for meaning without a sense of life meaning can be an indicator of existential distress for HF patients.

79) Abstract 1560

RELIGIOSITY/SPIRITUALITY AND HEALTH OUTCOMES OVER 18 YEARS IN MIDUS: DOES PURPOSE IN LIFE PLAY A MEDIATING ROLE?

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Background: A growing body of research relates religiosity/spirituality (RS) to health outcomes via multiple pathways. One potentially important mediator between RS and health is purpose in life (PIL), which has not been investigated in large-scale longitudinal studies. Further, though RS is conceptualized as multidimensional, it is often assessed only by religious service attendance.

Methods: Using data from the Midlife in the United States (MIDUS) project, a national sample of middle-aged and older adults (*N* = 7,108 at baseline) spanning three collection points across 18 years, the authors investigated PIL as a mediator of the relations between RS and all-cause mortality, self-rated health (SRH), and hypertension (HTN). RS was measured at baseline by religious attendance and an RS Composite (RSC) based on an average of 11 items across five domains of RS involvement (e.g., religious importance, RS comfort seeking), capturing more of the complex nature of RS. Self-report PIL was measured at all waves using Ryff's Purpose in Life scale. SRH and HTN were also measured at wave 3. All-cause mortality was assessed via the National Death Index (through Oct. 2017). Cox proportional hazards, ordinary least squares, and logistic regression analysis were used to explore how PIL and RS independently predicted all-cause mortality, SRH, and HTN. PIL was tested as a mediator of these associations.

Results: PIL, RSC, and religious attendance significantly predicted mortality and SRH, at the $p < .01$ level. Religious attendance, but not RSC, predicted HTN at $p = .06$. PIL was predictive ($p < .01$) of HTN, SRH, and all-cause mortality. RSC and religious attendance both significantly predicted future PIL; $p < .001$. RSC at MIDUS 1 was associated with increased PIL at MIDUS 2; RSC $R^2 = .026$. Tests of mediation indicated a mediating role for PIL between RSC and SRH and all-cause mortality, but not HTN.

Conclusion: The results suggest partial mediation of the relationship between RS and SRH and all-cause mortality over 18 years by PIL. PIL did not mediate relations between RS and HTN. RS and PIL predicted SRH and mortality. This suggests a complex network of relationships between PIL and RS in regards to health and suggests that both may have overlapping as well as unique pathways of influence. Investigations into related behavioral and psychophysiological mechanisms are indicated.

80) Abstract 1590

THE PRECIPITATION THEORY OF MENTAL ILLNESS AND BACK-PAIN AT WORK

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The problem: Sickness-leave presents a substantial economic burden to companies. In Germany average medically certified sick-leave hovers around 4% of all work-days. However huge within industry and between-group variation is present (e.g. from 2% to 14% across companies). Assuming a random distribution of underlying health problems and health-behaviors amongst employees working in the same context it is unlikely that real variation of true medical problems accounts for this variation. Additional factors that affect individuals transition from a pre-disease state (e.g. chronic aging process in the muscular-ligamental-bone assembly of the lower back) to aggravation of symptoms and medically certified sick-leave. This is supported by the notion that managers often observe sudden medically unexplained changes in sick-leave rates at the work-group level, e.g. after changes in work-group leadership, threat of closing a production plant, loss or win of prestigious projects or other factors that are difficult to be causally linked to a change in medical condition.

The precipitation hypothesis to sick-leave from work: To understand the medically unexplained variation between work-groups, we suggest a new model where disease manifestation occurs as a stochastic event in individuals on a continuation of underlying symptom and disease severity. Subclinical disease predisposition is like water molecules in air. They remain in the gaseous stage until the relative humidity reaches 100%. The amount of water molecules air can retain in the gaseous stage depends on the air temperature. Once the temperature drops below the dew point, precipitation occurs at random. We posit to view psychosocial work characteristics (stressors and resources) like air temperature. As psychosocial work characteristics deteriorate, more individuals experience transition from preclinical status to illness – as is empirically shown in an accompanying prospective cohort study.

Consequences of the precipitation model: The precipitation theory of illness at work suggests to revisit health promotion at work: Improving psychosocial work conditions at the group level should have at least the same priority as does individually targeted health promotion efforts – fog is best removed by raising the temperature rather than offering individual resilience training for staying gaseous to water molecules.

81) Abstract 1631

IDIOPATHIC SCOLIOSIS: INVESTIGATING THE POTENTIAL PSYCHOSOCIAL IMPACT OF EARLY SCREENING AND LONG-TERM MONITORING AMONG PATIENTS AND CAREGIVERS

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Adolescent Idiopathic scoliosis (AIS) is a three-dimensional deformity of the spine of unknown aetiology. Curve progression occurs during pubertal growth spurt, and curves that exceed 50 o are associated with impaired cardiorespiratory function, increased prevalence of back pain, poor body image, and negative psychological effects. Surgical correction of the deformity with instrumented spinal fusion is the only treatment option if the curve reaches 50 o during adolescence. However, if the curve is detected early, spinal bracing can prevent curve progression.

In Hong Kong, school screening for AIS was introduced in 1995 by the Department of Orthopaedics and Traumatology at our institute in collaboration the Department of Health. It is offered to all students in grade 5 or aged 10 years or above until they reached grade 13 or were 19 years old with voluntary participation. Patients with clinically detected scoliosis are referred to a tertiary institute for long-term monitoring until skeletal maturity.

Nonetheless, school screening remains a subject of debate within the medical community, and a polarity in recommendations about the legitimacy of screening for AIS exists. However, little to no studies examine the psychological and social processes that characterise the patients and caregivers.

This longitudinal study recruit newly referred patients and caregivers. Measures of demographics, disease misconception, self-esteem, life stress, body image, social support, health-related quality of life, and caregiver burden will be administered until patients are discharged.

It is hypothesized that there will be no main effect of psycho-social processes. Rather, patients who struggle with lower levels of self-esteem, greater reported life stress, negative body image, mood disturbances, and weaker social support will have lower levels of health-related quality of life and this may in turn impact their adherence to long-term monitoring and/or treatment. It is also hypothesized that caregivers who have greater levels of disease misconception and report greater life stress will have higher caregiving burden.

Findings will answer a long-standing question about the psychological impact of screening and monitoring. Results can identify the idiosyncratic patterns of struggle(s) which can help clinicians tailor health education and address concerns to increase adherence.

82) Abstract 1297

DEVELOPMENT OF THE DISABILITY CAREGIVING STRESS INDEX: RELATIONS OF DISTINCT STRESS DOMAINS TO MENTAL AND PHYSICAL HEALTH OUTCOMES AMONG PARENTS OF CHILDREN WITH DEVELOPMENTAL DISABILITIES

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Background: Parents of children with disabilities experience greater stress and worse health-related outcomes than parents of typically-developing children (Fritz & Sewell-Roberts, 2018). However, current stress measures are ill-suited to this population because they are too broad to capture the unique stressors faced by those caring for a child with a disability. The present study aims to 1) explore the utility of a new disability-specific caregiver stress index and 2) examine its relation to mental and physical health outcomes.

Participants: Eighty parents (66 mothers, 14 fathers) of children with disabilities were recruited from pediatric therapeutic services and parent support groups. Diagnoses included autism spectrum disorder (36), cerebral palsy (20), Down syndrome (9), genetic disorders (7), global developmental delay (4), epilepsy (4), spina bifida (2), and muscular dystrophy (1). Disabilities were mild (11%), moderate (47%), or severe (39%).

Methods: Participants completed online surveys, including SF-36 mental and physical functioning, CES-D depression, physical symptoms, and health behaviors. The Disability Caregiving Stress (DCS) index was created for this study based on a review of parent-caregiver stress in the context of developmental disabilities and prior pilot testing of parent-caregivers.

Results: Caregivers reported greater depression on the CES-D and worse mental functioning on the SF-36 than US population norms (depression: clinical cutoff exceeded by 19% of population vs. 67% of sample; mental functioning: population mean=50 vs. sample mean=36.6). Exploratory PCA with Oblique rotation of the DCS items yielded four factors with eigenvalues greater than one: caregiver physical strain/neglect (6 items), social-emotional strain (8 items), frustration with other caregivers/institutions (7 items), and caregiving tasks (4). Total DCS was correlated with worse mental functioning (r = -.62***), physical functioning (r = -.24*), depression (r = .63***), physical symptoms (r = .33**), nutrition (r = -.36***), exercise frequency (r = -.23*), and sleep disturbance (r = .60***). Simultaneous regression analysis of the factors showed that outcomes were largely predicted by physical strain/neglect and caregiving tasks.

Conclusions: The DCS is a promising disability-specific caregiver stress measure. Time 2 data collection is ongoing.

83) Abstract 1097

INDIVIDUAL EVALUATION AND HEALTH OF PORTUGUESE PUBLIC SERVANTS

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Backgrounds: What is the impact of individual performance evaluation, by peers, superiors and customers, related to given goals (SIADAP) on the professional and intimate relations and in the health of Portuguese public servants?

Methods: A qualitative longitudinal exploratory study, using clinical interviews techniques, with 10 workers, 2 mid-level manager and a top executive, all from the Portuguese Public Administration.

Results: New Public Management implementation, 10 years ago, created profound changes in work relations, in which top executives are subject to pressure from government who create yearly goals, evaluate bi-annually mid-level managers, which in return, evaluate the workers, benchmarking them, use rankings and quotas, distorting the real work being done.

Where there was a "public service logic", management by professionals of the same branch who knew the workers, and promotions by seniority, it changed to quantitative management - by distant and omnipotent managers,which evaluate the individualistic merit of the worker's performance.

Without group strategies, all employees are lonely and competing, fearing not achieving goals, with the hierarchy accusing subordinates in public of incompetence, laziness, and indiscipline. Anger, revolt, cleverness, and somatic markers do not lead to gregariousness and cooperation for survival. The "public servants" instead of empathic and concernful attitudes show themselves as unmotivated and in ethical suffering.

Many are vulnerable to psychosomatic diseases. At the level of the mind, when in distress, they react with hyperactivity or indifference, until exhaustion. Others react strangely, feeling the loss of recognition, and enter depression. Insecurity extends to relationships outside work, in love and parental life, but also in social relations, with disconnection and disorganization of relationships. Disturbances associated with pain, chronic fatigue and insomnia, in somatic functional syndrome, or the inflammation of the extremities, joints and spine in musculoskeletal disorders. Among these employees, there are some with alcohol and drug use, hypertension and cardiovascular disease.

Conclusions: It is necessary to create discussion and collective decision spaces in the workplace, cooperative management, and implementation of work psychosomatic consultations.

84) Abstract 1055

MECHANISMS OF CHRONIC PAIN AND FATIGUE IN FIBROMYALGIA AND ME/CFS: CONTRIBUTION OF AUTONOMIC AROUSAL

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Intoduction

Pain and fatigue are debilitating symptoms in Fibromylagia and ME/CFS

Previous evidence from psychophysiology and neuroimaging studies suggest altered CNS plays a key role in pain and the neurobehavioural features experienced

Method

21 participants with Fibromyalgia (4) and ME/CFS (11) and combined disease (6) took part in the study. They were assessed according to ACR criteria for Fibromyalgia and the Fukada/CDC/Canada definition for ME/CFS. Subjective measurements of pain, fatigue and anxiety (VAS scales) were made whilst supine and whilst under and orthostatic challenge (60 degree head up tilt, 12 mins)

Results

Preliminary data shows physical, mental and overall fatigue significantly increased ($p < 0.002$) after tilt table provocation. Data also shows bodily arousal (via tilt table provocation) produces a significant change in pain ($p < 0.002$) when comparing mean VAS scores pre and during tilt. Table 1 shows a 8.45mm increase in the mean Anxiety VAS. This illustrates that tilt provocation did tend to increase subjective feelings of anxiety.

Discussion

These results may suggest a hyper response of these patients' autonomic nervous system resulting in fatigue manifesting both physically and mentally. Data in this study has demonstrated the impact of bodily arousal on pain, fatigue and anxiety in patients with FM and ME/CFS. This is intriguing as pain and fatigue are amongst the most debilitating aspects of the conditions.

Conclusions

Further data will facilitate comparison of CFS & FM patients to healthy controls, further highlighting key differences to provide essential personalised treatment direction

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85) Abstract 1222

THE NUMBER OF PHYSICAL SYMPTOMS AND HEALTH ANXIETY PREDICT HEALTH

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Background: Medically Unexplained Symptoms are physical symptoms occurring in the absence of known organic disease. Previous research suggests that the number of physical symptoms (PS) is associated with the number of medical consultants and physical functioning, and health anxiety (HA) is associated with general anxiety and depression. The objective of this study was to examine PS and HA as predictors of physical and emotional health. **Methods**: Cross-sectional data from the online Self-Assessment Kiosk were used. Participants were surveyed on their health anxiety (Health Anxiety Inventory), number of physical symptoms (PHQ-15), functional impairment (WHODAS 2.0) and emotional health (PHQ-9, GAD-7). One-way ANOVA was conducted to test the effects of physical symptoms and health anxiety on physical and mental health. Results: Of 172 participants, 74% were men, 34% had a post-secondary education and 44% were married. The mean age was 39.5 (SD14.5). Using validated cut-offs, 60% reported high HA, 39% reported reported high PS. There was a significant main effect of PS on functional impairment ($F(1,125) = 7.95$, $p < .001$). Those with a high number of PS reported worse functional status ratings (M=2.22) compared to those with a low number of PS (M=1.42). There was also a significant main effect of HA on functional impairment ($F(1,125) = 32.53$, $p < .001$). Those with a high HA reported worse functional status ratings (M=2.38) compared to those with low PS (M=1.49). The interaction between the two factors were not significant ($F(1,125) = 2.29$, $p = .13$). In terms of emotional health, results indicated a significant main effect of PS on depression ($F(1,165) = 30.51$, $p < .001$) and anxiety ($F(1,166) = 14.36$, $p < .001$). Those with a high number of PS reported higher scores of depression (M=10.93), and anxiety (M=9.40) compared to those with a low number of PS (M=5.20, 4.70, respectively). Results also indicated a significant main effect of HA on depression ($F(1,165) = 15.68$, $p < .001$) and anxiety ($F(1,166) = 24.87$, $p < .001$). Those with high HA reported greater depression (M=11.47), and greater anxiety (M=10.48) than those with low HA (M=6.09, 5.01). The interaction between the two factors were not significant ($F(1,166) = .15$, $p=.70$).

Conclusions: Both the number of physical symptoms and health anxiety independently predict emotional health and functional impairment.

86) Abstract 1326

PSYCHOLOGICAL PREDICTORS AND CORRELATES OF FATIGUE IN PHYSICAL HEALTH CONDITIONS: A SYSTEMATIC REVIEW OF REVIEWS

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Background. Fatigue is a common, distressing and disabling symptom across a wide range of physical health conditions. The severity and impact of fatigue is usually only weakly correlated with markers of illness severity. Models of primary fatigue suggest that affective, cognitive and behavioral factors contribute to the onset and maintenance of fatigue. These psychological factors have been reviewed on a condition by condition basis. The purpose of our study was to draw together this literature in a systematic review of reviews, to examine whether there are common psychological predictors and correlates of fatigue across conditions. **Methods.** A computerised search of databases including Web of Science, Cinahl and Medline was conducted in July 2018, using broad search terms. 4603 titles or abstracts and 71 full texts were screened to select articles in English which reviewed studies reporting statistical relationship(s) between one or more psychological factors and fatigue in a health condition. Data were extracted onto a data extraction form. A narrative synthesis of findings from included studies was performed. **Results.** Twenty reviews were included in the current review. Five of these related to cancer, five to post stroke fatigue, two to rheumatoid arthritis, two to inflammatory bowel disease. There was striking heterogeneity in the designs, measures of fatigue, predictor variables, and method of analysis in the original studies reviewed and in the reviews themselves. Twelve reviews used a box-analysis method, reporting the proportion of studies in which a variable was examined and found to be significantly related to fatigue. In these analyses, depression was the most widely studied variable, and was related to fatigue in 193/232 analyses and all 19 reviews that included it. Anxiety was related to fatigue in 51/66 analyses. Few cognitive variables were consistently studied or reviewed, but 4 reviews found that catastrophizing was a consistent predictor of fatigue. **Conclusions.** While the direction of the relationship is unclear, depression is associated with fatigue and should be assessed and treated. Treatment approaches which target the cognitions involved in catastrophizing may be useful. Research comparing psychological predictors across conditions is needed to

determine whether a transdiagnostic cognitive behavioural model of fatigue is feasible.

87) Abstract 1481

EXPOSURE TO INTIMATE PARTNER VIOLENCE INFLUENCES MENTAL AND PHYSICAL HEALTH IN HEALTHY YOUNG ADULTS, REGARDLESS OF AWARENESS

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Background: Intimate partner violence (IPV) accounts for approximately 21% of all violent crimes in the US, and victimization rates are highest among young adults. The experience of a traumatic event, such as IPV, negatively affects both psychological and physical health, potentially via over-activation of the stress systems. **Method:** Healthy college students (N=118; 70% female; 63% white; 19.7± 1.8 years) completed a one-time in-lab health assessment and a series of questionnaires either prior to or during the lab visit, including a modified version of the Composite Abuse Scale. We examined the effect of any IPV exposure on health, comparing those who endorsed one or more IPV experiences and no endorsement, as well as the cumulative effect of IPV experiences in a subsample (N=54; 84% female, 69% white, 19.9±2.1 years) that reported IPV exposure. **Results**: Forty-six percent of our sample reported exposure to one or more IPV events, however only 17% (N=9) of those self-identified as having experienced IPV. IPV exposure was associated with poorer self-reported physical and mental health, elevated depressive symptoms and resting heart rate (p's<.05), and lower heart rate variability (HRV; p<.10). Among participants who endorsed any IPV exposure, the number of IPV experiences was positively associated with HRV (p<.05); further, the relationship appears to be driven by the psychological abuse subscale. All analyses controlled for sex, age, and body mass index. **Conclusion**: In healthy, young adults, objective IPV exposure was linked to poorer self-reported mental and physical health, regardless of an individual's awareness as being a victim of IPV. The current results can inform screening practices, suggesting that a list of experiences may identify victims of IPV better than a single-item question. Additionally, although IPV exposure was related to poorer mental and physical health, greater IPV exposure was unexpectedly associated with more parasympathetic activation. Further investigation is necessary to understand this counterintuitive finding. For example, it is possible that greater IPV exposure leads to the termination of an abusive relationship, thereby ending the stressful situation, while relationship maintenance may be more common with lower IPV exposure, creating a chronically stressful situation.

88) Abstract 1272

HEALTH AND QUALITY OF LIFE IN CHILDREN UNDERGOING ELECTIVE SURGERY

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Multiple studies have found that poorer health is associated with significantly lower quality of life when comparing children and adults with health conditions such as cancer, diabetes, asthma, and ADHD to their normal healthy counterparts. The relationship between health and quality of life, however, has yet to be examined in children who have undergone elective surgery. Consequently, this study analyzes the effects of health on the quality of life of pediatric patients ages 2-12 who have undergone elective surgery at the Children's Hospital of Orange County (N = 86). Surveys were distributed to parents, who were asked to rate both their child's overall health and child's quality of life preoperatively and again seven days after surgery. Health was found to be significantly correlated with the child's quality of life both before ($r(86) = .348$, $p = .001$) and after ($r(51) = .472$, $p < .001$) surgery. Specifically, children who were healthier (both before and after surgery) had higher levels of quality of life. Further, this association between health and quality of life was significant for all the quality of life dimensions (physical, emotional, social, and school functioning, ps < .05) both before and after surgery. These results further emphasize the importance of treating pediatric patients with a holistic approach, in which physical, emotional, and social health are all monitored along with school functioning. Moreover, clinicians may want to consider following up on pediatric patients' quality of life in the recovery process, as their follow-up quality of life could be linked to their health status following surgery. Future studies could take into account other factors such as gender or ethnicity or could observe the effects of health on quality of life in teenagers, an age group characterized by higher depression rates and lower self-esteem.

89) Abstract 1456

POST-EXERTIONAL MALAISE RELATES TO SYMPTOM BURDEN AND PSYCHOLOGICAL STATUS IN CHRONIC FATIGUE SYNDROME

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Background. Chronic Fatigue Syndrome (CFS) is characterized by debilitating fatigue that does not remit with rest. Centers for Disease Control (CDC) CFS criteria are polythetic, including additional symptoms (e.g., sore throat, post-exertional malaise (PEM)) that may or may not characterize an individual with CFS. A criticism levied against the CDC criteria contends that PEM is actually a primary, distinguishing feature of the disorder. Using archival data, this exploratory study aimed to investigate whether CFS patients with PEM (wPEM) differ from those without PEM (woPEM) on fatigue severity, other CFS symptoms, and psychological indicators of affect and social disruption.

Methods. Patients were classified as wPEM (n=139, age $\bar{x}$=48.6, 85% women) and woPEM (n=122, age $\bar{x}$=49.9, 86% women) with the CDC CFS Inventory. All completed the Inventory, the Fatigue Severity Index (FSI), the Profile of Mood States (POMS), the Center for Epidemiologic Studies Depression Scale (CES-D), and the Sickness Impact Profile (SIP) Social Interactions dimension at the baselines of randomized trials. Group differences were examined with Analysis of Covariance, controlling for age and gender.

Results. CFS patient groups were equivalent in terms of age, gender, race/ethnicity, and education (p*'s >.30).* Compared to the woPEM group, wPEM patients reported significantly greater CDC CFS symptom Total scores ($F(1,257)=96.48$, $p<0.001$), FSI Interference scale scores ($F(1,257)=30.97$, $p<0.001$), FSI Intensity item scores ($F(1,257)=47.42$, $p<0.001$), POMS Total Mood Disturbance ($F(1,257)=6.62$, $p=0.011$) and Confusion-Bewilderment scores ($F(1,257)=11.45$, $p<0.001$), CES-D depressive symptoms ($F(1,257)=10.17$, $p=0.002$), and SIP Social Interactions dimension scores ($F(1,257)=20.60$, $p<0.001$).

Conclusion. CFS patients with and without PEM may differ in terms of symptom burden and psychological status, suggesting that PEM operates as a marker of CFS severity and may identify patients who would benefit most from psychosocial interventions. Because the heterogeneity of CFS complicates research and treatment, identification of subgroups that differ in terms of etiology, presentation, or treatment response would be clinically meaningful. Future studies should consider physiological differences between PEM subgroups as well as differential responses to treatment in those with and without this important symptom.

90) Abstract 1002

RELATIONSHIPS BETWEEN PERFECTIONISM AND HEALTH BEHAVIORS IN CANCER PATIENTS

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Background: Unhealthy behaviors, such as physical inactivity, smoking, and alcohol abuse, are associated with poorer prognosis and quality of life in cancer patients. These behaviors have been associated with perfectionism in the general population, but the extent to which perfectionism is associated with health behaviors in cancer remains unknown. **Objective:** To investigate the associations of perfectionistic strivings (PS) and perfectionistic concerns (PC) with health behaviors (i.e., exercise, tobacco and alcohol use) cross-sectionally at the peri-operative period (T1) and longitudinally 2 (T2), 6 (T3), 10 (T4), 14 (T5) and 18 (T6) months later. **Methods:** 953 patients with non-metastatic cancer completed the Multidimensional Perfectionism Scale-Frost at T1. Participants were categorized according to whether or not they had a clinical level (i.e., a score corresponding to a percentile ≥ 75) of PS and PC (4 groups). Health behaviors were measured at each time point through self-report. **Results:** Participants without clinical perfectionism reported a significantly lower alcohol use as compared to participants with a clinical level of PS (*p*=.04). No group effect was found on exercise and tobacco use. Clinical level of both PS and PC at T1 was associated with decreased exercise from T1 to T6, while a clinical level of PS was only associated with increased exercise. Having both a clinical level of PS and PC at T1 was related to a greater tobacco use at T1 that decreased slightly from T2 to T6. **Conclusions:**Clinical levels of PS and both PS/PC tend to be associated with unhealthier behaviors cross-sectionally and longitudinally.

91) Abstract 1003

TRAJECTORIES OF PHYSICAL ACTIVITY DURING CHEMOTHERAPY FOR BREAST CANCER

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Background: Prior research has found that, taken as a whole, breast cancer patients tend to become less active during chemotherapy and to increase slightly their physical activity (PA) level afterwards. However, distinct trajectories of PA during and after chemotherapy are possible. **Objectives:** In women receiving chemotherapy for breast cancer, to: 1) investigate the global (total sample) evolution of PA before (T1), during (T2), and after chemotherapy (T3), as well as 3 (T4) and 6 (T5) months later; 2) document the different PA trajectories from T1-T5; and 3) investigate the moderating effect of the initial PA level (T1) on the subsequent PA trajectories (T2-T5). **Methods:** 50 participants completed the Godin Leisure-Time Exercise Questionnaire (GLTEQ) at each time point. **Results:** A significant time effect was obtained on the GLTEQ mean score in the total sample (*p* = .002). Latent class growth modeling revealed two trajectories of PA. The first one was characterized by low PA that increased slightly and steadily from T1-T5, while the second showed moderate PA that remained stable from T1-T3 and increased from T3-T5. Participants with low levels of PA at T1 became significantly more active over time (*p*=.001), whereas no significant time effect was found in participants with moderate and high levels of PA at T1 (*p*s=.77 and .07, respectively). **Conclusion:** The evolution of PA during and after chemotherapy is variable across patients. The end of chemotherapy appears to be a critical moment when women tend to increase their levels of PA, especially when inactive prior to treatment.

92) Abstract 1334

UNDERSTANDING THE RELATIONSHIPS AMONG RACIAL/ETHNIC MINORITY STATUS, SOCIOECONOMIC STATUS, MOOD/ANXIETY, AND CYTOKINES IN WOMEN UNDERGOING SURGERY FOR SUSPECTED GYNECOLOGIC CANCER

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Introduction: Minority and low socioeconomic status (SES) individuals are at higher risk for negative health outcomes, though little is known about the biological and psychological mechanisms that inform these health disparities. Williams (1997) has posited a socioecological model describing relationships among minority status, SES, psychological wellbeing, and immune processes. Literature also identifies potential relationships between lower SES and higher proinflammatory (e.g., Interleukin [IL]-6) and proangiogenic (Vascular Endothelial Growth Factor [VEGF]) cytokines, both of which confer risk for poorer cancer outcomes. This study explores relationships among minority status, SES, mood/anxiety, and IL-6/ VEGF levels among women undergoing surgery for suspected gynecologic cancer.

Methods: Participants consisted of 87 women with clinically significant sleep disturbances undergoing surgery for suspected gynecologic cancer. SES was determined by a Bureau of Justice Statistics composite of responses to the McArthur Sociodemographic Questionnaire (MSQ). Racial/ethnic minority status was dichotomized based on MSQ responses. Depression and anxiety were assessed by the Beck Depression Inventory II (BDI-II) and State and Trait Anxiety Inventory (STAI), respectively. IL-6/VEGF were measured via pre-surgical blood draw assayed using Enzyme-Linked Immunosorbent Assay.

Results: Six path analyses were conducted examining the relationships among minority status, SES, mood/anxiety, and IL-6/VEGF using IBM® SPSS® Amos 24.0 (See Figure). Model 3 had the best fit ($\chi 2(6)=8.635$, p=.195, NFI=.776, CFI=.849, RMSEA=.071) and explained 7.6% of the variance in IL-6. The standardized direct effect of minority status on SES was -.328 (p=.006). The standardized direct effects of SES on trait anxiety and IL-6 were -.518 (p<.01) and -.309 (p=.032), respectively. There was no significant indirect effect of SES on IL-6 through trait anxiety.

Conclusion: Racial/ethnic minority status was associated with lower SES, which in turn was associated with greater trait anxiety and IL-6 levels in our sample of women undergoing surgery for suspected gynecologic cancer. Further research is needed to examine whether socioeconomic disadvantage is associated with poorer cancer outcomes via greater IL-6.

VIEW PDF

93) Abstract 1333

CAN YOGA PRACTICE IMPROVE FATIGUE IN CANCER SURVIVORSHIP? A META-ANALYSIS

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BACKGROUND: Fatigue is one of the most commonly reported symptoms accompanying cancer treatment and may persist for many years after diagnosis. Mind-body approaches, particularly yoga, are frequently used by cancer survivors to cope with treatment-related symptoms, including fatigue. However, consistency of yoga related effects and whether yoga acts directly on fatigue or via changes in depression or quality of life (QoL) are not known. This meta-analysis was designed to examine effects of yoga RCTs on fatigue in cancer survivors and to assess potential psychosocial mediators as well as

patient and intervention characteristics that may be potential moderators of intervention effects.
METHODS: *PubMed* and *PsycINFO* were searched for peer-reviewed articles of yoga RCTs including only cancer survivors and reporting at least one measure of fatigue. 28 studies met inclusion criteria involving a total of 1791 participants, who were primarily female breast cancer survivors. Effect sizes (Hedges' *g*) were calculated for fatigue change outcomes for both groups.
RESULTS: Yoga practice was associated with a small but significant decrease in fatigue (*g*=0.44, CI=0.07-0.81, p=0.019). Yoga type was a significant moderator of this relationship; Iyengar, Hatha, and Restorative yoga, although still significant predictors, were associated with weaker effects than other yoga types (*p*=0.005). Neither timing of treatment (during- vs. post-treatment) nor clinical characteristics were significant moderators of the effects of yoga practice on outcomes. Yoga practice was associated with a moderate decrease in depression (*g*=0.76, CI=0.18-1.33, p=0.009), but was not associated with significant changes in QoL (p=0.48). Yoga's effects on depression did not significantly mediate effects on fatigue (p=0.116). Session length was a significant moderator of the relationship between yoga practice and depression, with longer sessions associated with stronger effects (p=0.013).
CONCLUSIONS: Results suggest yoga may be beneficial as a component of treatment for fatigue and depression in cancer survivors. It is possible that reduction of inflammation may be one mechanism underlying these effects; however, there were inadequate studies to test this within a meta-analytic model. Future research should include biological outcomes such as inflammatory cytokines in a wider variety of cancer populations.

94) Abstract 1636
ASSOCIATION BETWEEN LIFETIME STRESS EXPOSURE AND BEHAVIORAL SYMPTOMS IN WOMEN NEWLY DIAGNOSED WITH BREAST CANCER DIFFER BY TYPES OF STRESSORS EXPERIENCED
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Background: Exposure to life stress is associated with poor physical and mental health. However, such experiences vary along several dimensions, including timing, duration and severity, with differing health consequences. We recently reported that exposure to childhood adversity predicts more prolonged elevations in stress-related symptoms from diagnosis through early survivorship in women with breast cancer. We extend this work here by examining relations between cumulative lifetime stress exposure and behavioral symptoms in women with breast cancer at the time of diagnosis.
Methods: 40 women with breast cancer and 43 women without completed measures of stress, depression, sleep, and fatigue. Additionally, a subsample of participants (n=27) completed the Stress and Adversity Inventory (STRAIN), which is a comprehensive online interviewing system that assesses individuals' exposure to many different types of stress across the life course.
Results: Women with breast cancer reported more fatigue, depressive symptoms, and perceived stress than those without cancer. Both groups reported elevated sleep disturbance. No group differences were observed with respect to overall lifetime stressor count or severity. However, women with breast cancer reported greater exposure to health and treatment-related stressors. Moreover, count of lifetime stressors was related to more physical and mental health complaints, and greater fatigue and depressive symptoms. Experiences of humiliation and relationship stressors were associated with greater depressive symptoms and sleep disturbance. Finally, exposure to chronic (but not acute) early adversity stressors was associated with more fatigue, sleep disturbance, and depressive symptoms.
Conclusions: Greater lifetime stress exposure is associated with elevated risk for fatigue, sleep disturbance, and depression following a diagnosis of breast cancer. However, exposure to chronic stressors during childhood potentially is more detrimental than experience of acute childhood adverse events. In addition, stressors specifically related to interpersonal relationships, as well as those involving humiliation, may put women at a greater risk for depression and poor quality of sleep. Greater precision in isolating the sources of stress-vulnerability at the time of breast cancer diagnosis may provide more targeted approach to interventions.

95) Abstract 1350
GROUP VERSUS INDIVIDUAL ACUPUNCTURE FOR THE TREATMENT OF CANCER PAIN
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Background: Individual acupuncture has been recognized as an evidence-based complementary therapy for cancer patients and survivors to alleviate cancer-related symptoms, such as nausea and vomiting from chemotherapy treatments, fatigue, hot flashes and pain. Group acupuncture is a newer approach that needs further investigation using rigorous scientific methods. This study examines the effectiveness of group versus individual acupuncture in cancer survivors for improving symptoms of pain (primary outcome), fatigue, sleep disturbances and distress, as well as increasing social support.
Methods: A randomized controlled non-inferiority trial comparing individual acupuncture to group acupuncture was conducted at the Tom Baker Cancer Centre in Calgary, Canada. Inclusion criteria included a minimum pain score >3 on the 10-point Brief Pain Inventory, any type of cancer diagnosis, including metastatic disease. Patients were excluded if they had received acupuncture in the last 6 months, or were currently on or within one-month of active treatments (chemotherapy, radiation, surgery). Participants across both treatment groups received acupuncture twice a week over 6 weeks (12 sessions). The group acupuncture sessions treated anywhere between 3-7 participants together, each in reclining chairs in a circle, with needles inserted sequentially into participants for 20 to 25 minutes during which time they could converse or remain quiet. The procedures in the individual treatment group were the same, but alone in a private room. Measures of pain (primary outcome), fatigue, sleep disturbance, distress and social support (secondary outcomes) were assessed pre-post intervention and direct costs associated with each intervention compared.
Results: Data from 73 participants have been collected pre-and post-intervention (I=39, G=34). A linear mixed model analysis using intent to treat principles to assess comparisons across individual and group acupuncture will be conducted on all primary and secondary outcomes. Potential treatment moderators of sex, age, and cancer type will also be included as potential covariates.
Discussion: If group acupuncture is equally effective as individual acupuncture for pain management and if we observe additional benefits such as cost-savings and increased social support, group acupuncture may be a desirable health care investment for implementation.

96) Abstract 1834

PSYCHOSOCIAL CORRELATES OF AFFECT AND FUNCTIONAL HEALTH RELATED QUALITY OF LIFE IN MEN WITH ADVANCED STAGE PROSTATE CANCER

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Background: Health related quality of life (HRQoL) has been indicated as a predictor of both overall survival and general well-being in individuals with cancer. Additionally, research has linked positive affect with physiologic measures of health as well as psychological wellbeing. As survival rates for advanced stage prostate cancer are increasing, it is important to understand correlates of HRQoL and positive affect in order to provide more targeted survivorship care. As such, this study aims to delineate these associations by means of path analysis.

Methods: A diverse sample of one hundred ninety-three men who had been treated with androgen depravation therapy for advanced stage prostate cancer were recruited through hospitals from the greater Chicago area. Participants completed measures evaluating functional HRQol (FACT-G), distress (IES-R), social support (ENRICHD), affect (ABS), benefit finding (PCS), and coping confidence (MOCS). Structural Equation Modeling was used to examine the overall fit of a proposed path model and evaluate relationships between variables.

Results: Path analyses adjusted for age and comorbidities revealed a well-fitting model (χ^2=4.73, p=0.32, RMSEA=0.03, CFI=0.997, SRMR= 0.026) in which there were direct associations between functional HRQoL and distress (β= -0.232 p<.01), social support (β=.208 p<.01), and affect (β=.413 p<.01). Direct associations were also found between affect and distress (β=-.422 p<.01) and affect and social support (β=.136 p=.017). Lastly, benefit finding (β=.128 p=.011) and coping confidence (β=.40 p<.01) also had direct associations with affect. R-square was 0.501 for functional HRQoL and 0.491 for affect.

Conclusions: Findings indicate distinct pathways related to both affect and functional HRQoL. Further longitudinal research is needed to evaluate the directional nature of these associations as well as the underlying mechanisms. These relationships have the potential to function as targets in interventions directed at increasing positive affect and functional HRQoL in prostate cancer patients and survivors.

97) Abstract 1566

HAVING CO-MORBID CVD AT TIME OF CANCER DIAGNOSIS - ALREADY ONE STEP BEHIND WHEN IT COMES TO HRQOL?

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This study examines the relation between co-morbid CVD at the time of cancer diagnosis and HRQoL among cancer survivors diagnosed with colorectal, prostate, thyroid, endometrium, ovarium cancer, melanoma, Hodgkin, non-Hodgkin, chronic lymphocytic leukemia (CLL), or multiple myeloma (MM).

Secondary analyses were based on data from the PROFILES registry. Data on co-morbid CVD at cancer diagnosis was extracted from medical records. HRQOL was measured by the EORTC QLQ-C30 at a median 4.6 years after cancer diagnosis. General Linear Model Analyses were run for the total group of cancer survivors and for each malignancy.

In total, 5930 cancer survivors (2281 colorectal, 1054 prostate, 280 thyroid, 177 endometrium, 389 ovarian cancer, 212 melanoma, 194 Hodgkin, 874 non-Hodgkin, 242 CLL, and 227 MM survivors) were included. Survivors had a median age of 61 years at cancer diagnosis, and little over half was male. For the total group, survivors who had a CVD at the time of cancer diagnosis reported significant and clinically important lower scores on overall QoL, physical functioning and dyspnea (p's <0.05) compared to those without CVD. Colorectal cancer survivors with a co-morbid CVD at cancer diagnosis reported lower scores for physical functioning (B=-6.89) and dyspnea (B=5.75) of small clinical importance. Prostate cancer survivors reported small clinically important lower scores on overall QoL (B=-4.67), physical (B=-6.77) and role functioning (B=-7.20) yet more fatigue (B=5.06) and dyspnea (B=8.26). Ovarium cancer survivors with co-morbid CVD reported more symptoms of dyspnea (B=8.50), of small clinical importance. A small clinically significant effect was found for cognitive functioning (B=-8.46) among melanoma survivors. A small clinically important difference was reported by Non-Hodgkin survivors for physical functioning (B=-6.29), yet more symptoms of dyspnea (B=11.58), which was of medium clinical importance. CLL survivors with a co-morbid CVD reported small clinically important lower scores on overall QoL (B=-9.03), physical (B=-13.80), role (B=-10.58), emotional (B=-7.58), and social functioning (B=-9.24), yet more fatigue (B=10.42). No significant relations were seen among thyroid, endometrium, Hodgkin, and MM survivors.

Having a co-morbid CVD at the time of cancer diagnosis negatively impacts HRQoL even years after cancer treatment is finished.

98) Abstract 1632

LONG-TERM EFFECTS OF CANCER TREATMENT ON GUT MICROBIOTA, METABOLIC, IMMUNE, PSYCHOLOGICAL, AND COGNITIVE-BEHAVIOURAL PARAMETERS IN ADOLESCENT AND YOUNG ADULT (AYA) CANCER SURVIVORS

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Background: The gut microbiome is an important modulator for immune, metabolic, and psychological function. Gut microbial dysbiosis can induce aberrant neurophysiological function and behaviour. Cancer treatments adversely affect gut microbiota, and alter immune, metabolic and HPA-axis function. Cancer among AYA's has risen 38% in recent decades. Adolescence is a critical period for neurocognitive development, which is influenced by the gut microbiome. Understanding cancer treatments' effects on gut microbiota and psycho-physiological function is critical to minimize survivors' risk for chronic health problems, but remains unexamined. This study aims to investigate chemotherapy induced gut dysbiosis, and associations between gut microbiota, immune, metabolic and cognitive-behavioural outcomes.

Methods: We will conduct a single-center cross-sectional cohort study. Participants will include cancer survivors who have received chemotherapy, are 10-25 years old, and between 3 months to 3 years off treatment (N=70). Where possible, a healthy sibling will be included (N= ≥40). Demographic and clinical data, including diet, exercise, and history of antibiotic use, will be collected. Fecal DNA will be extracted using FastDNA Spin Kit and sequencing data will be obtained via Illumina sequencing methodologies at the Centre for Health Genomics and Informatics. Depression, anxiety, QOL and cognitive function will be measured via PROMIS. The Attention Network Task will measure executive function, and the Go-No-Go task will measure impulsivity. Dual-energy X-ray Absorptiometry (DXA) scan will measure body composition. Pro-inflammatory cytokines will be assayed from serum, and long-term cortisol will be assayed from hair samples.

Results: ANOVA's will examine differences between survivors and healthy siblings. Correlation, regression, and mediation analyses will examine relationships between clinical factors, psycho-behavioural and physiological parameters.

Conclusions: It is critical to examine how cancer treatments selectively alter the intestinal microbiota and the implications for immune, metabolic, and psychological functioning. With this

knowledge, crucial supplementation via co-administering specific health promoting bacteria (i.e. probiotics) could potentially be used to reverse psycho-behavioral, immune and metabolic deficits, ultimately leading to improved health.

99) Abstract 1555

THE IMPACT OF CANCER-RELATED TRAUMA ON THE HEALTH-RELATED QUALITY OF LIFE OF PEDIATRIC ACUTE LYMPHOBLASTIC LEUKEMIA SURVIVORS

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Background: Lifetime prevalence of cancer-related posttraumatic stress disorder (PTSD) in pediatric cancer survivors is as high as 20%. More broadly, trauma symptoms are significantly associated with reduced health-related quality of life (HRQL) in long-term adult survivors of childhood cancer; however, less is known about the presence and strength of this association in pediatric cancer survivors. This study examined the association between PTSD symptoms and HRQL in a sample of acute lymphoblastic leukemia (ALL) survivors and healthy controls. **Methods:** Participants included ALL survivors between 8-18 years of age, 2-7 years post treatment (N=22) male=50.0%, mean age=11.64 years, and age- and gender-matched healthy controls (N=24) male=50.0%, mean age=11.00 years. Questionnaires assessed demographics, PTSD symptoms (CPSS-V), and HRQL (PedsQL). **Results:** Mean PTSD symptom severity scores did not significantly differ between survivors (M=9.55, SD=8.97) and controls (M=9.52, SD=8.70, p=.993), nor did mean HRQL between survivors (M=75.62, SD=13.93) and controls (M=77.52, SD=9.93, p=.619). However, moderation analyses showed that the relationship between PTSD symptoms and HRQL (*b*=.38, *SE*=.18, *p*=.041) significantly differed between groups such that the association between PTSD symptoms and HRQL was of greater magnitude in the ALL survivors compared to the control group (*b*'s -1.06 versus -.30). Qualitative data suggest that survivors' trauma experiences more often concern death and dying than controls. Data collection is ongoing. **Conclusions:** These results suggest that pediatric ALL survivors may be more impacted by life-threatening traumas than healthy children, which is reflected by greater reductions in HRQL due to trauma.

100) Abstract 1494

IMPLEMENTATION OF IM FIT: A MULTIDISCIPLINARY LIFESTYLE MODIFICATION PROGRAM FOR CANCER SURVIVORS

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Overweight/obesity is associated with increased risk of cancer recurrence, increased severity of treatment-related effects, and decreased functional health. Lifestyle modification, including proper nutrition, physical activity, and stress management, has been shown to improve health outcomes. We aimed to implement an intensive lifestyle modification program for cancer survivors, called IM Fit, through the Integrative Medicine Center (IMC) at The University of Texas MD Anderson Cancer Center. Eligibility criteria were BMI > 25, cancer history, and completion of cancer treatment. The program consisted of 12-weekly 4-hour group sessions and 3 individual sessions with a clinical psychologist, dietitian, and physical therapist. Assessments included psychosocial, physical function, and nutritional intake measures, and weight and body composition at pre-, mid-, and post-intervention. Following the 12-week intensive component, participants attend a monthly group meeting with a clinical psychologist for one year, and individual follow ups with psychology, physical therapy and nutrition 3, 6, and 12 months after completion. Program implementation and data collection is on-going. Eighteen participants have initiated IM Fit and dropout rate is 17% (n = 3). Program completers (n = 15) were mostly female (87%), with an initial mean BMI of 35.2 (range 25.9 to 61.9), mean age of 57.8, with most common cancer history being breast cancer (53%). Participants averaged a loss of 7.5 lbs (range +2.2 – -16.9) over 12 weeks (4.1% body weight). Eighty-seven percent (n = 13) completed pre- and post-questionnaire data. Overall average activity increased from 968 min/week to 2312 min/week. Performance on most physical function measures improved. Survey results showed a 1 serving increase/week of legumes and chicken, and a 1.3 serving decrease/week of processed foods and sweets. We observed decreases in average scores for PHQ-9 depression (-3.8 points), GAD-7 anxiety (-2.9 points), and distress thermometer scores (-1.3 points). There were minimal changes in self-reported sleep quality. Delivering a multidisciplinary, outpatient lifestyle modification program was feasible and demonstrated positive changes in physical, nutritional, and emotional health. The IM Fit program provides a framework for the inclusion of a formal lifestyle modification program as part of oncology care.

101) Abstract 1794

A REVIEW OF ETHNIC DIFFERENCES IN SURVIVAL AMONG LUNG CANCER PATIENTS

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Introduction: Robust evidence documents significant disease resilience and mortality advantages for Hispanics/Latinos relative to non-Hispanic whites (NHWs). This epidemiological phenomenon is commonly referred to as the Hispanic Health Paradox (HHP) given the relative difference in risk burden. The current aim was to conduct a scoping review to examine ethnic differences in lung cancer outcomes and determine appropriateness of a meta-analysis.

Methods: 718 unique abstracts were identified through electronic database searches in Medline, PubMed, Embase, Web of Science, and Cochrane Library using 2 search term categories: Hispanic and lung cancer. Records were restricted to articles and abstracts published from 2000-2018, in English, involving human subjects, and including a direct survival comparison between NHWs and Hispanics with lung cancer. A study was considered supportive of the HHP if Hispanic lung cancer patients had a significantly lower hazard ratio or no significant difference in survival when compared with NHWs after controlling for staging and treatment-related variables. The review of abstracts eliminated 644 papers and full review of the remaining 62 papers yielded a final sample of 29.

Results: Data were reported from various subsets of the Surveillance, Epidemiology, End Results database (14 studies; 48%), California Cancer Registry (8 studies), Lung Cancer Mutation Consortium (1), Cancer Care Outcomes & Surveillance Consortium (2), San Francisco Bay Area Lung Cancer Study (1), Nevada Cancer Registry (1), Department of Defense Automated Central Tumor Registry (1), and the Nationwide Inpatient Sample (1 study). Twenty-six of the 29 studies (89.7%) had adjusted models demonstrating a survival advantage among Hispanic lung cancer patients compared to NHWs (0-20% lower risk of overall mortality; 0-26% lower risk of cancer-specific mortality). The remaining 3 studies showed a Hispanic survival disadvantage, 2 of which consisted of never-smoker samples (34-105% higher risk of overall mortality; 4-8% higher risk of cancer-specific mortality). The lack of heterogeneity in data sources precludes conducting a meta-analysis at this time.

Conclusions: This review generally supports the HHP in lung cancer survival, except among never-smokers, where Hispanics may experience a survival disparity. Implications and next steps will be discussed.

102) Abstract 1450

RELATIONSHIPS BETWEEN RESPIRATORY COMORBIDITIES AND DISTRESS FROM COUGH, PAIN, AND FATIGUE IN LUNG CANCER PATIENTS ON ACTIVE ONCOLOGIC TREATMENT

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Background: Among lung cancer patients, respiratory symptoms—such as cough—are particularly distressing due to the unexpected nature of their frequency and severity. Additionally, lung cancer patients evidence compromised physical health and report several bothersome physical symptoms (e.g. pain, fatigue) that can interfere with quality of life. Medical comorbidities are associated with higher physical symptom burden, but it is unknown whether the presence of specific respiratory comorbidities (i.e., COPD, emphysema, asthma) contribute towards greater symptom distress from cough, pain, and/or fatigue in lung cancer patients. This study tested relationships between the aforementioned medical comorbidities and the bothersome physical symptoms of cough, pain, and fatigue. **Method:** Participants (N=103; 51% male; mean [SD] age = 64.2 [13.2] years) were men and women receiving medical treatment for lung cancer. Participants completed validated measures of physical symptoms. Comorbidities were assessed via medical chart review. Controlling for age, gender, race/ethnicity, and smoking status, multivariable linear regressions were used to test the whether the presence of respiratory disorders (i.e., COPD, emphysema, and/or asthma) was associated with higher distress from cough, pain, and fatigue, respectively. **Results:** The presence of respiratory comorbidities significantly predicted higher distress from cough (ΔR^2=.04, p=.045) but not from fatigue (ΔR^2<.01, p=.934) or pain (ΔR^2=.02, p=.132). Smoking status and sociodemographic characteristics were not associated significantly with distress from cough, pain, or fatigue (all p>.07). **Conclusion:** The presence of comorbid respiratory disorders was associated with higher distress from cough, but not pain or fatigue. Patients with comorbid respiratory disorders likely cough more frequently, which may contribute towards distress. Coughing has been associated with disease-specific anxiety in lung cancer patients, perhaps because it can occur suddenly and may be less predictable than symptoms of fatigue or pain. Coughing and breathlessness have been identified as undertreated symptoms of lung cancer, and patients with comorbid COPD, emphysema, and/or asthma may benefit from targeted symptom management efforts to address cough.

103) Abstract 1183

ELECTROMAGNETIC FIELDS EMITTED FROM A HUMAN AND THE GROWTH OF MOUSE LUNG CARCINOMA

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Electromagnetic therapy is a promising approach in the treatment of cancer with several FDA approved devices. However, whether electromagnetic fields (EMF) emitted from humans can suppress tumor growth through modification of the immune system and inflammatory pathways has not been extensively studied. For *in vitro* studies, human non-small cell lung cancer A549 cells were plated overnight followed by one time only treatment either by Sean Harribance (SH; Tx) or control for 30 min at room temperature. For *in vivo* study, the mouse Lewis lung carcinoma model was used and mice were exposed to either Tx or control for 30 min every 3 days. Three *in vivo*experiments were conducted: two where Tx was started either when tumors had just become palpable or when initial volume was no more than 20 $mm^3$and a third where Tx was started after initial tumor volume was 80-100 mm^3. For the *in vitro* and *in vivo* studies SH and control person were in the same room approximately 15 feet apart. We found that the Tx significantly inhibited the proliferation of human NSCLC A549 cells by down-regulating pAkt. We further observed that when treatment was started when tumors were small, the Tx significantly slowed tumor growth as evidenced by smaller tumor volume (Tx = 274.3 ± 188.9 mm^3 vs Control = 740.5 ± 460.2 mm^3, $p < 0.04$) and tumor weight ($p < 0.025$) than the control group. The Tx group had 15% fewer Ki67-positive cells and the tumors had more cleaved caspase-3–positive cells than did controls. Treatment markedly reduced tumoral expression of pS6, a cytosolic marker of cell proliferation, by 45% compared to that of the control group. Results of reversed phase proteomic array suggested that the treatment substantially down-regulated the PDL-1 expression in the tumor tissues. Similarly, the serum levels of cytokines, especially MCP-1, was significantly reduced in treated mice ($p < 0.05$). Furthermore, TILs profiling showed that $CD8^+/CD4^-$ immune cell population was increased by almost 2-fold in TX mice with number of $CD68^+$macrophages in tumors being 33% less than that of the control group. There were no group differences when Tx was started when the tumors were 80-100 mm^3. Together, these findings suggest that EMF emitted by a human is capable of suppressing tumor growth mediated through modification of immune function and anti-inflammatory activity in our mouse lung tumor model.

104) Abstract 1307

A PROSPECTIVE RELATIONSHIP BETWEEN ATTACHMENT INSECURITY AND RECURRENCE OR SPREAD OF EXTREMITY SOFT TISSUE SARCOMA

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Insecure adult attachment (attachment anxiety and attachment avoidance) is associated with health behaviors, physical and psychological symptoms and biological processes. However, it is not known if attachment insecurity is related to cancer outcomes. We hypothesized that insecure attachment at the time of extremity soft tissue sarcoma (STS) resection would predict higher relapse rate and shorter time to relapse. **Methods**. Patients treated at a tertiary care center for STS complete a 12-item abbreviated version of the ECR attachment measure. Clinical status is reviewed at regularly scheduled follow-up visits (currently ≤ 256 weeks). Time to first relapse (local recurrence or metastasis) is recorded in weeks. Data collection and follow-up are ongoing. Time to relapse was compared between groups with high vs. low attachment anxiety (top tercile vs. lower terciles) using Kaplan-Meier survival analysis. Subsequently, Cox regression was used to control for clinical covariates. The analysis was repeated for high vs. low attachment avoidance. **Results**. Of 176 patients, 56% were male. Mean age was 57 years (range 18-90, SD 16.3). Tumors represented a range of histologic types. Clinical characteristics were: grade 1-18%, 2-46%, 3-36%; location deep 73%, superficial 27%; surgical margin microscopically negative in 78%; no evidence of metastatic disease at time of first presentation in 91%. Relapse rate was 34% in high attachment anxiety and 18% in low attachment anxiety (Chi^2 5.4, p=.02). In Kaplan Meier analysis, high attachment anxiety was associated with shorter time to relapse (mean 149.6 weeks, 95% CI 114.2-185.1 vs. 169.0 weeks, 95% CI 154.4-183.5, Mantel-Cox Log Rank Chi^2 5.1, p=.02). Cox regression analysis revealed that attachment anxiety (OR=2.2, p=.02) was significant when controlling for sex, age, stage, and tumor depth. When tumor grade (OR=3.1, p<.001) was added to the analysis, attachment anxiety became non-significant. Analyses for attachment avoidance were non-significant. **Conclusions**. Interim analysis indicates that for patients with extremity STS, attachment anxiety is significantly associated with both relapse rate and time to relapse in univariate analyses. However, this effect is non-significant when controlling for tumor grade (usually

the strongest determinant of survival). Data collection which will increase the power of the analysis is ongoing.

105) Abstract 1458

STRESS EXPOSURE AND STRESS-REACTIVITY IN THE CONTEXT OF DIABETES RISK: BASELINE RESULTS FROM THE RICHMOND STRESS AND SUGAR STUDY

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Background

Notable racial/ethnic and socioeconomic (SES) disparities in cardiometabolic disorders, including type 2 diabetes (T2DM), are thought to be due, in part, to the effects of chronic stress and environmental constraints. Chronic stress is thought to influence cardiometabolic risk via alterations in the hypothalamic-pituitary-adrenal (HPA) axis. While the HPA system is dynamic, most population-based studies rely on static measures (e.g., circulating basal or diurnal cortisol). This study addresses this gap by empirically evaluating how HPA-axis reactivity to acute stress varies by race and SES in adults at high risk of T2DM. We hypothesize that individuals living in low SES (low resource/high stress) environment will have blunted HPA reactivity; racial/ethnic differences in stress reactivity will be attenuated after accounting for environment.

Methods

Data come from the Richmond Stress and Sugar Study, a longitudinal cohort of adults at high risk of T2DM recruited from primary care in Richmond, VA. Using a 2x2 sampling frame, Non-Hispanic Whites (NHW) and African Americans (AA) are each selected from low and high SES neighborhoods. Such sampling helps separate "race" vs. "place." To date, 125 adults aged 40-70 completed baseline visits. Stress event is induced via Trier Social Stress Test (TSST); stress reactivity assessed via salivary cortisol 8 times pre- and post-TSST. Participants complete an 1hr-interview on stress exposures and coping. Interviewers measure HbA1c, fasting glucose, cholesterol, blood pressure and body composition.

Results

Sample reached relative balance of high/low SES among AA (low/high: 46%/54%) and NHW (low/high: 32%/68%). AA and NHW were comparable in terms of age (NHW/AA: 59/65), baseline BMI (kg/m^2) (NHW/AA: 29/30), and HbA1c% (NHW/AA: 5.7/5.8). Based on fig 1, regardless of race/ethnicity, individuals from low SES had higher pretest mean cortisol and lower posttest response than participants from high SES, whose cortisol curves started at lower values, peaked after TSST, and returned to pretest level. Although AA had overall higher cortisol values than NHW, the change in cortisol curves in response to acute stress distinctly follows the pattern across SES.

Conclusions

Findings suggest that exposure to environmental stress alters reactivity to acute stress, captured by distinct patterns in HPA reactivity across neighborhood SES.

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106) Abstract 1209

LONELINESS AND BIOLOGICAL RESPONSES TO ACUTE STRESS IN PEOPLE WITH TYPE 2 DIABETES

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Loneliness is linked with all-cause mortality and coronary heart disease. Altered neuroendocrine and inflammatory responses to stress constitute potential pathways linking loneliness and ill-health. Stress responsivity is modified in people with type 2 diabetes, but it is unclear whether loneliness influences biological stress responses in this population. We assessed interleukin-6 (IL-6), interleukin-1 receptor antagonist (IL-1RA), monocyte chemoattractant protein-1 (MCP-1) and cortisol responses to acute stress in 135 people with type 2 diabetes. Loneliness was measured used the Revised UCLA Loneliness scale. Loneliness was inversely associated with cortisol output post-stress (B = -4.429, p = 0.019) independent of age, sex, education, marital status, body mass index and smoking. Lonelier individuals had raised MCP-1 concentrations 75 minutes post-stress independent of covariates (B = 0.713, p =0.022). No associations between loneliness and IL-6 or IL-1RA concentrations were detected. These results suggest that loneliness is associated with disturbances in stress responsivity in people with diabetes, and the impact of loneliness on health in people with diabetes may be mediated in part through dysregulation of inflammatory and neuroendocrine systems. Future research is required to understand if such changes increase the risk of poorer outcomes in this population.

107) Abstract 1654

EIGHT-MONTH STABILITY OF PLASMA EPINEPHRINE AND CORTISOL IN FASTED ADULTS AT BASELINE AND IN RESPONSE TO A GLUCOSE BOLUS

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Objective: Elevated epinephrine (EPI), cortisol and non-esterified fatty acid (NEFA) levels have been linked to cardiovascular disease and type-2 diabetes. Research suggests that sympathoadrenal activity can be reduced with exercise but individuals' EPI levels have also shown high stability over time in preterm infants and moderate stability in response to mental stress in adults. The aim of this study was to assess the stability of EPI, cortisol, and NEFA levels in participants who underwent an 8-month exercise intervention.

Method: EPI, NEFA, and cortisol levels were measured during identical IVGTTs performed 8 months apart in 30 non-diabetic overweight participants (20 men and 10 women) from the STRRIDE 1 cohort (mean age: 51±5). During the 8-month period, participants underwent exercise regimens with varying degrees of intensity and amount. Fasting (baseline) and mean levels during the first 20 minutes of the IVGTTs (post-glucose bolus) were calculated. Spearman rank correlations between the two time points were used to assess the test-retest stability of each measurement.

Results: Within individuals, baseline and post-bolus EPI levels before the intervention were significantly associated with post-intervention levels (Spearman's rho=.45, p=.013 and Spearman's rho=.54, p=.001). Post-bolus cortisol levels were significantly associated between the two time points (Spearman's rho=.38, p=.029), while the baseline cortisol levels were not (Spearman's rho=.28, p=.163). Fasting and post-bolus NEFA levels were not significantly correlated between the two time points (Spearman's rho=.07, p=.724 and Spearman's rho=.21, p=.23). We plan to collect data from about 90 participants and will assess potential moderators such as sex and exercise intensity/amount.

Conclusion: These preliminary results from our ongoing study show that plasma EPI levels exhibit moderate stability over an 8-month period, both in a fasted state and in response to a glucose bolus. Additionally, cortisol levels in response to the bolus showed significant stability, while fasting levels did not quite reach significance, potentially due to limited statistical power in this pilot sample. This data suggests that even though EPI levels can change rapidly in response to acute stressors, basal sympathoadrenal tone and its response to a standardized metabolic challenge show within-individual stability.

108) Abstract 1618

EPINEPHRINE, CORTISOL AND NON-ESTERIFIED FATTY ACID LEVELS DURING AN INTRAVENOUS GLUCOSE TOLERANCE TEST ARE ASSOCIATED WITH THE ACUTE INSULIN RESPONSE (AIR), AN EARLY RISK MARKER FOR TYPE 2 DIABETES

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Objective: Impaired acute insulin response (AIR) is an independent predictor of type 2 diabetes and an early risk marker that appears before other (clinical) indicators of impaired glucose regulation are evident. Injecting epinephrine (EPI) inhibits the AIR to a glucose bolus. In addition, studies have shown that chronic elevation of non-esterified fatty acids (NEFA) decreases glucose-stimulated insulin secretion. We hypothesize that enhanced counterregulatory hormone activity contributes to impaired AIR by increasing NEFA levels. We aim to test our hypothesis by examining the associations of AIR with EPI, cortisol and NEFA levels measured during an IVGTT in a total of 90 overweight, sedentary individuals.

Method: To date, 30 non-diabetic overweight individuals (mean age 51±5 years) have had glucose and insulin measured during an IVGTT from which minimal model parameters, including AIR, have been estimated. In addition, plasma EPI, cortisol and NEFA levels have been assayed. Fasting (baseline) and mean EPI, cortisol and NEFA levels during the first 10 minutes of the IVGTT were calculated. Spearman rank correlations were used to test for simple associations between AIR and EPI, cortisol and NEFA levels.

Results: AIR was significantly associated with post-glucose bolus mean levels (minutes 1-10) of EPI (Spearman's rho=-.49, p=.006), cortisol (Spearman's rho=-.44, p=.02) and NEFA (Spearman's rho=-.46, p=.01) as well as with all individual minutes 1-10 for EPI and NEFA. No significant associations were found between AIR and fasting EPI, cortisol or NEFA levels (Spearman's rho=-.18, -.25 and -.31 respectively, p's>.10). Future analyses on the final sample will examine to what extent changes in EPI levels precede and predict the NEFA and insulin changes, and examine synergistic effects of cortisol and EPI on NEFA and AIR.

Conclusion: High EPI, cortisol and NEFA levels in response to the glucose bolus were associated with impaired AIR. Our group has previously shown that metabolically healthy obese individuals have reduced EPI and cortisol levels and reactivity during mental stress compared to obese individuals with impaired fasting glucose levels. It is possible that pharmacological and/or behavioral interventions that are able to reduce exaggerated EPI and cortisol responses can improve glycemic control in individuals at risk of developing type 2 diabetes.

109) Abstract 1478

SUBJECTIVE WELLBEING AND GLYCATED HAEMOGLOBIN OVER EIGHT YEARS IN OLDER ADULTS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING: THE ROLE OF REGULAR PHYSICAL ACTIVITY

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Background: Previous research has shown an association between subjective wellbeing and incident diabetes. Less is known about the role of wellbeing for subclinical disease trajectories as captured via glycated haemoglobin (HbA1c). We aimed to explore the association between subjective wellbeing and future HbA1c levels, and the mediating role of physical activity.

Methods: We used data from the English Longitudinal Study of Ageing for this study. Subjective wellbeing (CASP-19) was measured at wave 2 and HbA1c was measured eight years later at wave 6. Participants were free from diabetes at baseline. We controlled for a wide range of sociodemographic, clinical and behavioural covariates including baseline depressive symptoms in linear regression models. The mediating role of physical activity was examined using Sobel tests.

Results: Models showed that subjective wellbeing was associated with greater HbA1c eight years later after controlling for age, sex, ethnicity, wealth, cohabitation, baseline HbA1c, depressive symptoms, body mass index, smoking, and alcohol consumption (B = -0.002, 95% CI = -0.005-0.000, p = 0.039). However the direct pathway was fully mediated by the inclusion of regularity of engagement with moderate of vigorous physical activity in the model (B = -0.034, 95% CI = -0.057-0.012, p = 0.003).

Conclusions: We showed that the association between subjective wellbeing and greater HbA1c over eight years of follow-up was mediated by regular engagement in moderate or vigorous physical activity among older adults.

110) Abstract 1412

SOCIAL MEDIA USE ON AMBULATORY BLOOD PRESSURE

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Objective: Not much is known about the effect of the current cyber environment on ambulatory blood pressure. With an increasing demand of cyber technology, it will be important to recognize the possible effects on cardiovascular health as probed by ambulatory blood pressure regulation.

Methods: Eleven people (90% female, 60% African American) were surveyed using the media and technology usage and attitudes scale (MTUAS) -to measure the volume of social media usage; demographics were measured, as well as 24-hour ambulatory blood pressure.

Results: The higher social media use (B= .136, t= 4.145, p=.054) significantly predicted increased overnight systolic blood pressure, after controlling for age and race with the total model explaining 98% of the variance (r^2= .958, F(3, 2)=39.091 p=.025). Race also independently predicted overnight systolic blood pressure (B= 13.283, t= 9.931, p= .010) with higher systolic blood pressure in African Americans compared to European Americans.

Conclusion: The results indicate that higher social media use may contribute to elevation in overnight systolic blood pressure. The results also indicate that African Americans had elevated systolic blood pressure overnight compared to European Americans suggesting that cyber technology usage may contribute to hypertension and health disparities.

111) Abstract 1233

ELEVATED BLOOD PRESSURE AND FINANCIAL RISK-TAKING: POTENTIAL DAMPENING OF THREAT APPRAISAL

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Persons with elevated resting blood pressure (BP) are at increased risk for hypertension and exhibit dampening of emotional responses. This dampening has been seen for pain, photographic scenes, and facial expressions. Appraisal of threat is a valuable component of several models of health behavior, and is motivation to avoid risky behaviors. If BP-associated emotional dampening reduces threat perception, then persons with elevated resting BP may exhibit more risk behaviors. A recent study from our lab found associations between BP and risk-taking assessed by a health risk survey. We

hypothesize that persons with higher BP will take greater financial risks in a simulated lottery task. These results represent the full dataset follow-up on preliminary reports.

Ninety-three healthy, normotensive adults (21 men and 72 women) 18-43 years of age were recruited for a study of resting BP and financial risk-taking behavior using a simulated paired-choice lottery task. BPs were determined over a 10 minute rest period using a calibrated Dinamap V100 monitor. Participants then played a simulated lottery task involving ten paired-choice decisions to assess risk-taking. Other assessments included responses to evocative pictures, a delay discounting task, and impulsivity, sensation seeking, and perceived stress.

Average resting systolic BP (SBP) was 113.1 +/- 1.11 mmHg (mean +/- SE) and diastolic BP was 67.5 +/- .51. Women have lower SBP ($p<.001$), lower sensation seeking, and higher perceived stress ($ps<.05$) than men. Multiple regression predicting risk-taking from BPs indicated that higher resting SBP was associated with increased risk-taking after adjustment for age, sex, and other study variables (B= -.046, t= -2.498, p= .015).

Results suggest that SBP-associated dampening of threat appraisal predicts increased financial risk-taking. Moreover, the effect of BP on lottery risk is independent of delay discounting, an index of time distortion associated with substance-dependence, gambling, and other risk-taking behaviors. Proximity of CNS circuits that influence visceral, emotional, and motivational function may provide insight into the relationship between resting BP levels and risk behaviors. These results may facilitate better understanding of CNS mechanisms linking elevated BP to emotional dampening, and may provide new insights into risk-taking behaviors.

112) Abstract 1113

DIFFERENCES BETWEEN AFRICAN AMERICANS AND EUROPEAN AMERICANS IN TOTAL PERIPHERAL RESISTANCE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Decades of research suggest that there may be racial differences in the hemodynamic mechanisms that result in elevated blood pressure. Specifically, many studies have found that, in comparison to European Americans (EA), African Americans (AA) have higher resting total peripheral resistance (TPR), which is the resistance that must be overcome to push blood through the circulatory system and create flow. Elevated resting blood pressure via TPR particularly is associated with worse health outcomes, such as end-organ damage. The present meta-analysis and systematic review of the literature sought to clarify if significant differences in resting TPR exist between AAs and EAs. A search of the literature turned up 140 abstracts on differences in TPR between AAs & EAs; of those, 44 were included. Sample sizes, means and standard deviation for baseline TPR with samples that included both EA and AA participants were collected and true effect estimates as adjusted standardized mean differences (Hedges' *g*) were computed. Findings indicated that across studies, AAs had higher TPR than EAs, with this effect being nearly a full standard deviation difference (Hedges' g = .836, SE = .331, CI = 0.187, 1.484, p = 0.012). Additionally, EAs had higher cardiac output (CO) then AAs (Hedges' g = -.384, SE = .101, CI = -0.583, -.186, p < 0.001). This is particularly noteworthy, as researchers have reported a greater risk for cardiovascular events and death for individuals with elevated blood pressure maintained by increased TPR, rather than increased cardiac output. Implications involving psychological factors that may maintain elevated TPR in AAs compared to EAs will be discussed. In sum, the present meta-analytic review highlights the importance of the differences in TPR between AAs and EAs in understanding and addressing racial disparities in cardiovascular, and potentially psychological, health outcomes.

113) Abstract 1507

EFFECTS OF HEART RATE ON BLOOD PRESSURE AND BLOOD PRESSURE VARIABILITY

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Background: Like heart rate, blood pressure (BP) is not steady but varies on a beat-to-beat basis (BTB). High-frequency blood pressure variability (BPV) is the mechanical product of respiration-induced changes but the source of low-frequency (LF) BPV (0.04-0.15 Hz) is unclear, with evidence supporting central sympathetic oscillation, resonance in the baroreflex loop, and/or feed-forward influence of heart rate. Here, we detail the effects of variations in RR intervals (RRI), driven in large part by cardiac parasympathetic modulation, on BTB BP and LF-BPV.

Methods: BTB RRI and BP were collected in a sample of 1255 participants (age 35–84) in the Midlife in the United States study, a national study of health and well-being. Measurements were collected during an 11-minute seated baseline period and 6 minutes in the standing position. The effect of RRIs on systolic (SBP) and diastolic blood pressure (DBP) values were assessed by regression analyses, with lagged RRIs as the predictor variables. Spectrally-defined LF-BPV was compared before and after removing the effect of the RRI with the largest regression coefficient on the systolic (S-BPV) and diastolic (D-BPV) blood pressure.

Results: As expected, SBP and DBP depended on the previous RRIs. However, despite high correlations between adjacent RRIs ($r > .85$, $p < .01$), we noted a stronger and more delayed effect for SBP (3 beat lag, ß=-61.9 mmHg/sec, $p < .01$, $R^2 = .12$) than DBP (1 beat lag, ß=-26.4 mmHg/sec, $p < .01$, $R^2 = .12$) in the baseline period. During orthostatic stress, there was an additional delay in the effect of RRI on SBP (6 beat lag, ß=-60.8 mmHg/sec, $p < .01$, $R^2 = .12$) and an increase in the delay and magnitude of the effect on DBP (3 beat lag, ß=-40.3 mmHg/sec, $p < .01$, $R^2 = .12$). Removing the effect of RRIs from SBP and DBP led to 15.4% and 19.2% reduction in LF S-BPV and D-BPV respectively.

Conclusion: Our results quantify the feed-forward effect of variations in RRI on SBP, DBP and LF-BPV in participants tested at rest and during orthostatic challenge and support the view that heart rate plays a significant role in regulating LF BPV. Interestingly, this effect is greater for SBP than DBP and is enhanced by orthostatic stress. These findings are consistent with a significant contribution of cardiac parasympathetic modulation to low frequency blood pressure variability.

114) Abstract 1736

EXAMINING THE BENEFITS OF ESTRADIOL ON SELF-REPORTED SLEEP QUALITY IN THE MENOPAUSE TRANSITION

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Background

It is commonly assumed that estradiol (E2) replacement improves sleep in perimenopausal women by reducing vasomotor symptoms (VMS). However, recent findings showed that E2 improved sleep, even after accounting for VMS, suggesting other E2 mechanisms involved in sleep. To date, studies have not controlled for E2's antidepressant effects. Depression is both common in the perimenopause and associated with sleep difficulties.

Objective(s)
To determine the efficacy of transdermal E2 (TE) for improving self-reported sleep in perimenopausal women, after controlling for VMS and depressive symptoms.
Methods
Using a double-blind, placebo-controlled design, 179 healthy women meeting STRAW+10 criteria for being in the menopause transition or early postmenopause were randomized to 12 months of TE (0.1 mg/d) + 200 mg progesterone (12 days every three months) or placebo. Using standard questionnaires, self-reported sleep, depression, and VMS were obtained at baseline and bi-monthly post-randomization.
Results
Controlling for baseline levels, TE (vs. placebo) led to reductions in minutes to fall asleep (p=.047) and number of awakenings (p=.0029) over the 12 months. Controlling for changes in VMS and depressive symptoms, TE still predicted reductions in minutes to fall asleep (p=.024) and number of awakenings
(p=.027) over the 12 months.
Conclusions
We extend existing research by demonstrating that E2-improvements in subjective sleep cannot be fully explained by improvements in VMS or depressive symptoms. Research to examine the mechanism(s) underlying E2's effects for sleep would have public health significance for perimenopausal women and also advance our understanding of the pathophysiology of impaired sleep more generally.

115) Abstract 1017
LINKING VRAYLAR (CARIPRAZINE) AND SEX HORMONAL CHANGES IN YOUNG WOMEN AND EXTRAPYRAMIDAL SIDE EFFECTS (EPS)
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Introduction
Use of antipsychotic medications may cause adverse effects. Most antipsychotics work via Dopamine (DA) blockade at the D2 receptor site. Cariprazine, has multiple receptor sites including partial agonist activity at D2, D3, and 5HT-1A, with higher binding affinity at D3. Cariprazine has active metabolites (Desmethyl Cariprazine & Didesmethyl Cariprazine). Metabolites promote similar effects as the parent drug. In younger women, the partialism of competitive antagonism at the DA receptor sites can cause varying hypo/hyperestrogenic changes, leading to vasomotor symptoms. Estrogenic hormonal changes can in induce somatic symptoms. Co-occurrence with prolactin level changes can induce hypoestrogenic states, precipitating more EPS and other vasomotor symptomology.
Case Study
A 28-year-old G0P0 Caucasian Female presented to the office with unstable mood symptoms. She was diagnosed with Bipolar Type I Disorder, current episode depressed, severe. She was started on Cariprazine 1.5mg, PO QD. Two weeks later, during follow up, improvement was noted in overall mood, but some fluctuations persisted. Therefore, Cariprazine was increased to 3mg, PO QD. One month passed, her overall mood improved, and fluctuations decreased. However, she developed intolerable akathisia with menstrual changes, which she claimed affected her daily living. Thus, Cariprazine was stopped. Afterwards, gradual lessening of the akathisia and menstruation symptoms were noted on follow up visits.
Conclusion/Discussion
This case displays how Cariprazine can possibly induce estrogenic changes, due to the mechanism of action, leading to intolerable side effects (i.e. akathisia). This warrants that Psychiatrists and healthcare staff educate younger child bearing women of what is to be expected during treatment with Cariprazine, in terms of hormonal changes. Further, Psychiatrists and Allied Physicians must outweigh the benefits versus risks. Noteworthy, are the limitations when evaluating for sex hormonal changes in young women, which cannot be directly attributed to Cariprazine. This includes, use of oral contraceptive pills, illegal drug use, patient's weight, sexual activity, exercise/diet, and age range

116) Abstract 1045
EXAMINING THE LINK BETWEEN FATIGUE/TIREDNESS AND SEXUAL EXPERIENCE IN EVERYDAY LIFE - AN AMBULATORY ASSESSMENT STUDY
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Background: While fatigue appears to have a negative effect on human sexual functioning, tiredness has been associated with both an increase and a decrease in sexual interest and behavior. To date, these associations have not been investigated either bidirectionally or in an everyday life context. Furthermore, the differential effects of fatigue and tiredness have not yet been examined in the same study. Hence, in this ongoing study, the bidirectional relationship between fatigue/tiredness and sexual experience is examined in an everyday context using ecological momentary assessment. Specifically, we were interested in whether and how fatigue and tiredness at the previous measurement and on the previous day differentially influenced sexual experience and vice versa.
Methods: Sixty heterosexual healthy individuals (30 women, 30 men) are participating in the study. All subjects are between 18 and 30 years old, have been in a relationship for at least one year, have no children, and are not pregnant. Participants complete questionnaires six times a day for a total of fourteen consecutive days using an iPod touch (right after waking up, 11am, 2pm, 5pm, 8pm, right before going to sleep). The nested data will be analyzed using fixed effects models in HLM as soon as data collection is finished.
Results: Self-reported general fatigue (Multidimensional Fatigue Inventory, MFI), physical fatigue (MFI), tiredness (Multidimensional Mood State Questionnaire, MDBF), the intensity of sexual desire (based on the Sexual Desire Inventory, SDI) and the intensity of sexual arousal (based on the Sexual Arousability Inventory, SAI) are each assessed on a scale from zero to four. To control for possible moderators, depression is assessed using the PHQ-9, while sleep quality and couple interaction quality were assessed using a visual analogue scale ranging from zero to 100. The results will be calculated in time to be presented at the APS conference.
Conclusions: Experiencing fatigue and tiredness may affect sexual interest and behavior, and vice versa. The results of this study will contribute to our knowledge of possible associations between fatigue/tiredness and sexual experience in everyday life, but will also inform a better understanding of these associations in patients with sexual dysfunction.

117) Abstract 1181
PREDICTING SEXUAL SATISFACTION WITH A CURRENT PARTNER BASED ON PARTNER AND NONPARTNER SEXUAL VICTIMIZATION EXPERIENCE
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Background: Sexual victimization experience among women has been associated with negative outcomes, including decreased sexual satisfaction with a current partner (e.g., Kilimnik et al., 2016). However, whether the perpetrator was the victim's current partner was considered in only one study (Katz & Myhr, 2008), and no studies have examined whether current partner and nonpartner victimization experience may interact to impact satisfaction. An interaction was predicted based on a variation of the negative association hypothesis (Feldman-Summers et al., 1979); it was expected that women's sexual satisfaction with a current partner would be lower if victimized by a nonpartner than never victimized, less if victimized by a current

partner than a nonpartner (given that the current partner may be associated with the victimization experience), and lowest if victimized by both types of perpetrators.

Methods: Participants were college women (n = 304; mean age 18.98, SD = 1.19; 78% European American) currently in a relationship, and with either no history of victimization experience or experience within the past year on the Sexual Experiences Survey-Short Form Victimization (Koss et al., 2007). Women with experience were asked their relationship to the perpetrator(s). Participants also responded to the Global Measure of Sexual Satisfaction (Lawrance et al., 2011), and were categorized as "nonvictims" (n = 178), "current partner" (n = 16), "nonpartner" (n = 92), or "both perpetrator" (n = 18) victims.

Results: A 2 x 2 (Current Partner x Nonpartner) ANOVA revealed a significant main effect for current partner, $F(1, 302) = 8.96$, $p = .003$, $partial n^2 = .029$, but not for nonpartner, $F(1, 302) = .03$, $p = .864$, $partial\ n^2 = .000$, and no interaction, $F(3, 300) = .809$, $p = .369$, $partial\ n^2 = .003$. Women with current partner victimization reported lower sexual satisfaction with their current partner (M = 29.3, SD = 4.76, n = 34) than those without it (M = 32.0, SD = 4.56, n = 270).

Conclusions: Sexual victimization experience was associated with lower sexual satisfaction with a current partner when that partner was the perpetrator. Nonpartner victimization did not predict satisfaction. Overall satisfaction levels observed could reflect cognitive dissonance avoidance or unacknowledged victimization experience among current partner victims, and resiliency among nonpartner victims.

118) Abstract 1798

RELATIONSHIPS AMONG WEEKLY ESTRADIOL FLUCTUATION, STRESSFUL LIFE EVENTS, AND AFFECTIVE SYMPTOMS IN THE MENOPAUSE TRANSITION

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Background: The menopause transition (MT) is characterized by pronounced hormone variability, increased stressful life events, and an increased risk for affective symptoms compared to premenopausal women. Sensitivity to normal changes in estradiol (E2), but not absolute levels of E2, precipitate mood dysregulation, particularly in women with a history of stressful life events. Preliminary analyses of the current study examined E2 variability as a within-subject predictor of negative mood symptoms and found a significant interaction between E2 variability and symptoms of anxiety, such that greater E2 variability was associated with greater average anxiety symptom level. With a larger sample size, the current study will probe the moderating effects of recent stressful life events (RSLEs) on the relationship between E2 variability and anxiety symptoms.

Method: 45 women (mean age=50.36,SD=2.90) undergoing a natural MT provided 9 weekly serum E2 samples during baseline before randomization for a hormone manipulation trial. The State-Trait Anxiety Inventory (STAI) was administered at each of the 9 weekly visits to evaluate symptoms of anxiety. The Life Events Survey (LES) was used to evaluate the frequency and severity of RSLEs within 6 months prior to enrollment.

Results: Preliminary analysis (n=28) found that greater weekly E2 variability was associated with higher average anxiety symptom level (STAI) over the corresponding 9 weeks (r=0.48, p=.01). **Updated statistical analysis is pending completion of data collection for the current study.** We hypothesize that the relationship between E2 variability and anxiety symptoms will be moderated by RSLEs, such that the association between E2 variability and anxiety symptoms will be strengthened for women who have experienced RSLEs.

Conclusion: Preliminary results are consistent with a growing body of evidence that sensitivity to natural fluctuations in E2 may have pathophysiological relevance to reproductive mood disorders. Upon analysis of the larger sample size, we expect the significant relationship between E2 variability and affective symptoms of women in the MT to be moderated by RSLEs. This research will advance a diathesis-stress model of affective state change involving the pathophysiological role of E2 variability in the onset of affective symptoms for women experiencing stressful life events proximate to the MT.

119) Abstract 1125

RELATIONSHIPS BETWEEN GRATITUDE AND PERSISTENT ADHERENCE: A LSONGITUDINAL STUDY OF AIRWAY CLEARANCE THERAPY AMONG ADULT CYSTIC FIBROSIS PATIENTS

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There are indications that gratitude is related to more favorable psychosocial outcomes in some chronic illness populations. Little is known about potential associations with treatment adherence. For individuals with cystic fibrosis, daily airway clearance therapy is a core component of care, (part of a broader regimen that typically includes pancreatic enzymes, nebulized mucolytics, oral or nebulized antibiotics, and nutritional therapies). Poor adherence is a major concern. This study examined relationships between gratitude at baseline and subsequent levels of self-reported persistent adherence to ACT over the course of a year, in a sample of adults with cystic fibrosis.

Participants were drawn from a regional CF treatment center. Mean FEV_1% predicted was 65.47 (24.82), mean BMI was 21.89 (2.98), and average age was 27.15 (9.05). Participants completed a measure of gratitude at baseline (Gratitude Questionnaire-6). Self-reported adherence was assessed by a validated measure (Cystic Fibrosis Treatment Questionnaire) at baseline, 6-months, and 12-months. "Persistence" was defined as sustained adherence (i.e., missed no more than twice per week) at all assessment periods over the course of the year; "non-persistence" denoted patients classified as non-adherent during one or more assessments. Analyses controlled for baseline disease severity (FEV_1% predicted) and any demographic or clinical covariates that were significantly associated with persistence.

Only forty-six percent of patients reported persistent use of ACT (i.e., adherent at all assessment periods). In a logistic regression model that adjusted for disease severity, greater baseline gratitude predicted significantly greater likelihood of persistent adherence over the course of the year (OR=1.09, 95% CI: 1.002 - 1.20, p = .04).

Adherence to home airway clearance therapy is a critical aspect of treatment for CF patients, which has long been recognized as problematic. The current report provides initial evidence that sustained adherence over time, or "persistence", may be enhanced by gratitude. There is a need for further longitudinal research examining these associations, the mechanisms through which gratitude might affect persistence, and the impact on health outcomes.

120) Abstract 1197

LONGITUDINAL ASSOCIATIONS BETWEEN RELIGIOUS/SPIRITUAL INVOLVEMENT AND DEPRESSION ONE YEAR LATER AMONG ADULT CYSTIC FIBROSIS PATIENTS

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Very few studies have examined the health effects of religiousness/spirituality among adults with cystic fibrosis (CF). CF presents patients with recurring challenges, including multiple morbidities, disrupted functioning, burdensome treatment requirements, and an uncertain future. These disruptions might make religious/spiritual concerns more prominent. This longitudinal study examined conceptually distinct facets of religious coping, and their relationships with clinically elevated depressive symptoms one year later. Analyses were adjusted for baseline disease severity and other significant clinical or demographic variables.

Participants were receiving care from a CF treatment center. Average age was 27.51 (9.62), and average FEV_1% predicted was 66.82 (25.45). At baseline, they completed measures of general religious commitment, use of positive religious/spiritual coping strategies in response to the illness (i.e., benevolent religious reappraisal, spiritual connection), and use of negative religious/spiritual coping strategies (i.e., spiritual discontent, punishing God reappraisal), evaluated using the RCOPE. At 12-month follow-up, patients were screened for depressive symptoms using the Hospital Anxiety and Depression Scale (HADS-D).

The proportion of patients scoring within the possible case range for depression was 20%. In separate logistic regression analyses controlling for disease severity (FEV_1% predicted), lower likelihood of depression caseness at 12 months was predicted by higher general religiousness at baseline (OR= .38; 95% CI: .20-.73), greater use of benevolent religious reappraisal coping (OR= .88; 95% CI: .78-.997), greater use of spiritual connection coping (OR= .74; 95% CI: .58-.94), and lower spiritual discontent (OR= 3.82; 95% CI: 1.02-14.29). Punishing God reappraisal coping was not predictive.

The role of religiousness/spirituality merits closer attention among adults with CF. Such investigations have been surprisingly sparse in this setting, relative to research in other chronic illness groups. As anticipated, it appears that distinct aspects of religiousness and religious coping have differential associations with subsequent depression outcomes. At the next phase of research, it would be useful to assess clinical diagnoses of depressive disorders instead of screening outcomes.

121) Abstract 1050

CFSENIORS: NUTRITION AND MENTAL HEALTH IN OLDER ADULT PATIENTS WITH CYSTIC FIBROSIS

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BACKGROUND: Individuals with cystic fibrosis (CF) experience increased anxiety & depression compared to age matched counterparts without CF. Many CF patients suffer from nutritional deficiencies due to fat soluble vitamin malabsorption, leading to increased risk for poorer mental health (MH) in CF adolescents. Recent therapeutic advancements have significantly improved survival in CF; a patient born in 2018 is expected to survive into the fifth decade of life. Older patients with CF experience unique challenges related to their disease yet this age group is understudied. We sought to identify the relationship between age, nutritional deficiencies & MH outcomes in a CF population.

METHODS: Adult CF patients (n=162) were invited to complete the PHQ9 & GAD7 to assess depression & anxiety. Seven declined (5%; final n=155). Patients were grouped by age for analyses: 18-46 years (*younger adults*, n=133; 29.3±6.9 years) & 47+ years ("*CFSeniors," n*=22; 58.0±8.7 years). The clinic dietician collected nutritional data during routine clinical/lab visits. Analyses included descriptive/correlational statistics & independent samples t-tests to explore the relationships between age, nutrition & MH. Patients with elevated scores were provided MH resources and referrals.

RESULTS: "CFSeniors" (2.4±3.2) exhibited significantly lower GAD7 scores than their younger counterparts (5.0±5.1; t(130)= 4.92, p<.05) but not significantly lower PHQ9 scores (3.9±3.1) than younger counterparts (5.2±5.2; t(130)= 4.92, p=.32). Older age was significantly correlated with higher levels of Vitamin A (r=.24, p<.01) and E (r=.38, p<.01) but not D or K. "CFSeniors" had significantly higher Vitamin A (0.6±0.2) than their younger counterparts (0.4±0.2; t(143)= -3.14, p<.01) & higher Vitamin E (12.1±5.8) than younger counterparts (8.3±3.4; t(144)= 4.92, p=<.001). Vitamin D was positively associated with PHQ9 (r=.19, p<.05) & GAD7 scores (r=.20, p<.05).

CONCLUSION: Significant relationships were found between age, nutrition & MH in this sample. "CFSeniors'" milder MH outcomes may be associated with milder genotype & disease severity; future investigation is warranted. As the life expectancy for CF patients continues to improve, increased understanding of the interplay between MH in older adults with CF & the role of nutritional deficiencies is necessary.

122) Abstract 1670

EMOTION AND ASTHMA SYMPTOMS/PHYSIOLOGY IN A BIOFEEDBACK STUDY FOR ASTHMA

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This is a secondary analysis of emotional variables and correlations between pulmonary function and measures of emotion and asthma symptoms from a previously published study of heart rate variability biofeedback (HRVB) for asthma. Fifty-nine steroid naïve patients with mild or moderate asthma and current symptoms were randomly treated with HRVB or a combination of EEG biofeedback and training in paced breathing at a usual relaxed rate, about 15 times per minute. Patients were evaluated at the beginning and end of treatment periods of about three months. Questionnaires included the Asthma Control Test (ACT), Asthma Quality of Life Questionnaire with Standardised Activities (AQOL), the GAD7 (for anxiety), the PHQ8 (for depression), and the Nijmegen Questionnaire (for hyperventilation). We also measured airway function with spirometry, forced oscillation pneumography, and a methacholine challenge test.

RESULTS

We found that symptoms of asthma improved significantly in both groups, while and ratings of anxiety, hyperventilation, and depression declined only in the group receiving heart rate variability biofeedback. Exhaled nitric oxide decreased more in the heart rate variability biofeedback group, but there were no significant changes in spirometry or forced oscillation measures.

Pulmonary measures were correlated with airway inflammation. and both emotional and asthma symptoms. Over the course of treatment, we found a high correlation between changes in the ACT and changes in AQOL, as well as between changes in the GAD7 and changes in the PHQ9. Decreases in the Nijmegan scale were related to improvements in the ACT and AQOL. Improvements in AQOL were related to decreases in the PHQ9 but not the GAD7. There also was a significant negative correlation between changes in the PHQ9 and changes in the methacholine challenge test.

DISCUSSION

HRV biofeedback appears to help both asthma and emotional symptoms. Changes in physiological measures of asthma were related to changes in both emotional and asthma symptoms. The highest

relationship was with depression. The data are consistent with literature showing a relationship between asthma and emotion. It is possible that the pathway by which heart rate variability helps asthma is through effects on emotion.

123) Abstract 1648

RESTING HEART RATE VARIABILITY AND DISTRESS TOLERANCE: PRELIMINARY EVIDENCE FOR SEX DIFFERENCES

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Resting high frequency heart rate variability (HF-HRV) is widely accepted as a physiological index of psychological distress. Distress tolerance is defined as the capacity to experience and withstand a negative physiological state. However, studies have not yet examined the direct association between resting HF-HRV and self-reported tolerance of psychological distress. Moreover, previous research has theorized presence of an important compensatory mechanism in women but not men, marked by greater resting HF-HRV. In following preliminary investigation, the relationship between resting HF-HRV and distress tolerance were examined in 40 undergraduate participants (21 female). Given recent recommendations (Williams et al., *in press*), analyses were also completed with the sample split by sex. Resting HF-HRV was measured during a 5-minute baseline period. Distress tolerance was measured using the Distress Tolerance Scale (DTS) which included four subscales: (1) distress tolerance; (2) absorption; (3) appraisal; and (4) regulation. In this measure, greater scores represent greater distress tolerance. Results showed resting HF-HRV was not related to distress tolerance (r = .002, *p*=.713) in the full sample. However, when split by sex, women showed a positive association as we would predict (r = .424, *p* =.033), yet men showed a negative association (r = -.568, *p* = .064). There was also a significant difference between these correlation coefficients (*p* =.008). In women, results showed significant positive associations between resting HF-HRV and both absorption and appraisal subscales, whereas men showed a significant negative association with the tolerance subscale only. While the study is ongoing, these data provide preliminary evidence of a differential effect of compensation, marked by higher resting HF-HRV, in women compared to men. Potentially, in the domain of distress tolerance, higher resting HF-HRV in women may be effective in tolerating distress via absorption and appraisal. In contrast, men with higher resting HF-HRV tolerate less distress.This may partially be mediated by difficulties in emotion regulation, even at higher levels of HF-HRV, for men compared to women (Williams et al., in press); future research is needed in this regard. Overall, these results continue to highlight the importance of considering sex as a factor in psychophysiological research.

124) Abstract 1776

RESTING HEART RATE VARIABILITY AND PERSONLITY BETWEEN SEXES: A PRELIMINARY STUDY

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The five-factor model of personality; openness to experience, agreeableness, conscientiousness, neuroticism, and extraversion have been greatly influential in assessing mental and physical health. Research has also shown the five factor model used in various context including predicting achievement in working memory, academic motivation, and self-regulatory efficacy. Vagally mediated rate variability (vmHRV) is a known biomarker of psychopathology, overall health, and an index of self-regulatory capabilities. Previous research suggests a relationship between resting vmHRV and personality traits. Importantly, sex differences exist between both personality traits and resting vmHRV. The current preliminary study is the first to assess the relationship between resting vmHRV and personality traits, utilizing the ten item personality inventory (TIPI), split by sex. In this study, 42 undergraduate participants (21 female, 19 ethnic minority) completed a 5-minute baseline resting period, followed by the TIPI. The root mean square of successive differences (RMSSD) was used as our measure of vmHRV. Results showed a positive correlation between resting vmHRV and openness to experience (r = .32 p =.05). No other significant relationship was found between resting vmHRV and TIPI, however correlation coefficients are in the direction outlined by prior research. Split by sex, there was a significant relationship between resting vmHRV and consciousness for females (r=.47 p=.05), but this relationship was not found within men (r=.02 p=.94). Overall, this on-going study highlights that sex differences may exist in the association between greater resting vmHRV and personality traits, and in this instance, consciousness. These data also support recent recommendations for examining associations between resting vmHRV and psychological variables split by sex. Future directions, limitations, and additional implications will be discussed.

125) Abstract 1611

UNCOUPLING PHYSIOLOGICAL AND EMOTIONAL RESPONSES TO STRESS WITH MINDFULNESS: RELEVANCE TO PSYCHOSOMATIC MEDICINE

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High concordance between physiological and emotional reactivity to stress has been linked to increased symptoms of psychopathology and physical distress in mentally ill populations. Yet, it remains unknown whether low concordance is linked to greater psychological and physical well-being in the general population, and whether dispositional mindfulness "uncouples" physiological markers of stress from negative affect during stressful emotional experiences. Using data from an open trial in healthy adults (n = 64, age 22-64, 67% F, 84% white), we examined the degree to which concordance between change in negative affect (ΔNA) and cardiovascular reactivity (ΔHR, ΔSBP, ΔDBP) was moderated by self-report measures of dispositional mindfulness, depression, anxiety, and somatic distress. We hypothesized that: (1) greater mindfulness would weaken the association between ΔNA and cardiovascular reactivity in response to an anger recall stressor, and (2) depression, anxiety, and somatic distress would strengthen the association. Based on similar work in college students, we hypothesized that Pearson correlations between ΔNA and ΔHR would be above .40 among those scoring 1 SD below the mean on mindfulness (total score and non-judging subscale), and nonsignificant among those scoring 1 SD above the mean. As hypothesized, Pearson correlations between ΔNA and ΔHR were small for those high in overall mindfulness (r = -.214, p = .464) and non-judging (r = .041, p = .900), whereas concordance levels were markedly higher among those low in overall mindfulness (r = .448, p = .144) and non-judging (r = .419, p = .175). Depressive symptoms, however, were the only significant moderator in regression models, and for only one relationship: ΔNA and ΔDBP [F(3,59) = 2.029, p = 0.018, ΔR2 = .094], such that higher depression scores were associated with higher concordance. For the most part, self-reported symptoms of anxiety, depression, and somatic distress did not moderate concordance between emotional and physiological reactivity, indicating that concordance may not be a useful marker of mental or physical distress in healthy adults, versus adults with mental illness. However, effect sizes indicate that mindfulness did "uncouple" emotional and heart rate reactivity to stress, supporting the premise that trait mindfulness can buffer physiological responses to emotional stress.

126) Abstract 1705

RESTING STATE HEART RATE VARIABILITY IN CHILDREN AND ADOLESCENTS WITH ANXIETY AND HEALTHY CONTROLS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Among adults, anxiety is associated with reduced vagal activity, especially for individuals diagnosed with anxiety disorders. Available evidence of the strength of the association between HRV and anxiety among children and adolescents has not been reviewed systematically or meta-analytically. For our on-going meta-analysis and review, we searched two databases systematically for the terms informed by previous systematic reviews and meta-analyses of the literature concerning anxiety and resting HRV respectively. Preliminary searches yield 501 articles after removing duplicates. Through screening of abstracts, we aim to identify studies reporting differences in resting state vagally mediated HRV that compared clinically anxious children/adolescents to healthy controls. Abstracts will be included if they reported an empirical investigation of resting HRV conducted among human children or adolescents (<18 years of age). All titles that meet inclusion criteria will be retrieved and reviewed in full-text. Excluded studies and reasons for exclusion will be presented in a PRISMA Flow Chart. Studies conducted with infants (<2 years of age) will be excluded. Full-text of studies that remain will be reviewed further and screened for inclusion eligibility. To be included, studies must report (i) resting state measure of HRV in a (ii-a) clinical sample of anxious children/adolescents, or (ii-b) an assessment of anxious symptoms using a standardized psychometric instrument. Demographic, population, and measure information will be coded. Studies using time domain, frequency domain, and nonlinear measures to extract vagally mediated resting state HRV, according to established guidelines on measurement and interpretation of HRV, will be considered for inclusion. If the standard error of the mean (SEM) is reported, standard deviation (SD) will be calculated. Descriptive statistics (mean and SD) of HRV indices will be extracted from resting baseline recordings. True effect estimates will be computed as adjusted standardized mean differences. Meta-analysis will be performed using random-effect models. Results are expected to align with previous research showing significant differences in baseline HRV between adolescents with anxiety disorders and healthy controls. Coding and analyses are still in progress and will be completed no later than March 6th.

127) Abstract 1686

AN UPDATE ON THE ASSOCIATION BETWEEN RESTING HIGH FREQUENCY HEART RATE VARIABILITY AND EVERYDAY MUSIC LISTENING TENDENCIES

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Previous research has shown an influence of music listening on both brain activity and overall wellbeing. High-frequency heart rate variability (HF-HRV) is considered an index of both overall health and executive brain region activity, such that lower HF-HRV is associated with lesser activity in executive brain regions, poorer overall health, and poorer self-regulation abilities (e.g., cognitive, emotional). Three types or approaches to listening to music have been conceptualized through research: cognitive (intellectual appreciation), emotional (emotional regulation), and background-stimulus (background noise) listening. The current study aims to examine the potential association between self-reported everyday music listening tendencies and HF-HRV at rest. In a sample of 79 college-aged participants (mean age = 20.07±2.57), continuous heart rate data was collected via an electrocardiogram as participants first completed a 5-minute resting-baseline, followed a 15-item questionnaire that assessed their music listening tendencies. Results showed a greater tendency to listen to music in a cognitive manner was significantly associated with higher baseline HF-HRV (r = .274, p = .015). Additionally, results showed that higher overall endorsement of music listening tendencies was significantly associated with higher HF-HRV during baseline (r = .264, p = .019). However, significant correlations were not found between HF-HRV and background or emotional music listening. These correlations remained significant while controlling for age, sex, ethnicity, body mass index, and respiration (cognitive: r = .290, p = .014; total: r = .240, p = .042). These data extend previous research examining the potential relationship between music listening tendencies and HF-HRV; those with poorer self-regulation, as indexed by resting HF-HRV at baseline are less likely to listen to music for cognitive engagement. Overall, these data suggest that those with higher HF-HRV may seek external sources, such as music, for cognitive purposes. Implications for motivations of cognitive processes, and overall well-being will be discussed.

128) Abstract 1642

A PRELIMINARY UNDERSTANDING OF THE ASSOCIATION BETWEEN HEART RATE VARIABILITY AND NUMERACY

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Many individuals struggle to make decisions necessary to manage their health; such poor health decisions are costly to the individual and society at large. Research has shown that individuals' ability to make important judgments and decisions may be influenced by their numerical abilities, termed numeracy. Importantly, some researchers believe that numeracy tests often involve inhibiting an initial response in favor of the correct answer. Vagally mediated heart rate variability (vmHRV) serves as a psychophysiological index of inhibitory control and has been shown to predict judgments and decisions. However, vmHRV has not yet been evaluated with regards to its possible relationship to numeracy. The following preliminary study examined resting vmHRV and objective numeracy in a sample of undergraduate participants (n = 78). From a 5-minute electrocardiogram recording at baseline, vmHRV was assessed using the natural log of the root mean square of the successive differences (lnRMSSD). Numeracy was measured using the total of correct solutions (0-14) to mathematical problems from the 11-item Lipkus Numeracy Scale and 3-item Cognitive Reflection Test. In the full sample, there was no significant correlation between vmHRV and numeracy. However, using a median split on baseline vmHRV, analyses showed a significant positive correlation between vmHRV and numeracy among individuals within the low vmHRV group (Spearman's Rho = .41, p = .01), but not in the high vmHRV group (Spearman's Rho = .14, p = .39). In other words, amongst individuals with relatively lower resting vmHRV, higher resting vmHRV was associated with better numeracy scores and this pattern was not evident in individuals with relatively higher resting vmHRV. Overall, these preliminary data extend our prior work and further suggest that for individuals with lower relative levels of resting vmHRV, higher resting vmHRV is important for increased numeracy. Limitations and future directions will be discussed.

129) Abstract 1061

ETHNIC DIFFERENCES IN CARDIOVASCULAR REACTIVITY TO A COLD PRESSOR: HISPANIC YOUNG ADULTS DEMONSTRATE LOWER REACTIVITY RELATIVE TO NON-HISPANICS

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Background: Hispanic adults in the United States generally have better health and lower mortality compared to non-Hispanics (NH), including NH Whites. These outcomes are often characterized as paradoxical given the disproportionate psychosocial risks Hispanics face relative to NHs. Adding to this debate is accumulating evidence that despite greater stress exposure, Hispanics appear to experience lower biological evidence of that stress. The current study follows-up

on this observation by examining ethnic differences in cardiovascular reactivity (CVR) to a common stress challenge; the cold pressor.
Methods: The sample included 102 undergraduates (44 Hispanic, 58 NH) enrolled in a study of social support effects on cardiovascular reactivity. Participants completed a 10-min "vanilla" baseline followed by a 4-min foot immersion cold pressor. Blood pressure and heart rate were assessed at 1-min intervals and autonomic functioning was assessed continuously using impedance cardiography. The statistical models included age, gender, BMI, relationship length, anxiety symptoms, and depressive symptoms as covariates.
Results: As predicted, NHs had higher levels of CVR when compared to Hispanic young adults from baseline to the cold pressor task. NH participants had higher systolic blood pressure (BP), B = 3.33, 95% CI [5.88, 0.87], p = .009, higher diastolic BP, B = 2.63, 95% CI [4.91, 0.35], p = .021, higher heart rate (HR), B = 3.15, 95% CI [5.75, 0.55], p = .016, and higher CO, B = 0.19, 95% CI [0.33, 0.05], p = .008. Hispanic participants' raw reactivity in these outcomes were 2.24 and 2.36 less mmHg for systolic and diastolic BP, 2.72 less beats per minute in HR, and 0.15 L/min less CO compared to NH participants. There were not, however, significant differences by ethnicity in HR variability, left ventricle ejection time, stroke volume, or pre-ejection period. In addition, self-reported affect during the protocol did not explain the differences in CVR.
Conclusions: In this lab-based study, Hispanic young adults evidenced lower levels of CVR to a cold pressor task when compared to NH adults. These findings are consistent with emerging data suggesting ethnic differences in stress biomarkers and reactivity with potential implications for understanding aspects of the Hispanic health paradox.

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130) Abstract 1529
CHANGES IN HEART RATE VARIABILITY DURING AN INHIBITORY CHALLENGE PREDICTIVE OF DEPRESSIVE SYMPTOMS IN A NON-CLINICAL YOUTH SAMPLE
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According to the Neurovisceral Integration Model, resting heart rate variability (HRV) reflects top-down inhibitory influence of the pre-frontal cortex and is an index of parasympathetic activity (Thayer & Lane, 2000). Several studies demonstrate associations between vagal withdrawal (i.e. phasic decreases in HRV from resting levels) to emotional challenges and depressive symptoms in youth samples (Beauchaine & Thayer, 2015; Rottenberg et al., 2005). In the present study, we tested whether depressive symptoms were associated with patterns of resting HRV and changes in HRV during an emotional and inhibitory challenge in a sample of 146 adolescents and young adults (M = 16.68 SD = 2.40). Specifically, we utilized a task that was both an emotional challenge and a test of inhibitory control—the antisaccade task. Within this paradigm, participants were instructed to look away from an emotional (angry) face. Thus, we were able to examine the influence of an emotional stimulus on phasic HRV (as done in previous studies, Rottenberg, 2007), while simultaneously testing inhibitory control and its relation to phasic HRV. HRV was collected during a 5 minute baseline and continuously throughout the antisaccade task. The Center for Epidemiological Studies Depression Scale for Children (CES-DC) was used to measure depressive symptoms. Findings indicated that at lower levels of resting HRV, increases in phasic HRV during an emotional and inhibitory challenge were associated with higher levels of depressive symptoms (B = -.001, SE = .001), CI[-.003, -.0001], p = .041). No effect was present at higher levels of resting HRV. This study provides support that an augmentation response in the face of an emotional and inhibitory challenge is predictive of greater depressive symptoms for those with lower levels of resting HRV. Although studies have found that vagal withdrawal during an emotional challenge is associated with depressive symptoms (Rottenberg et al., 2005), it may be that our results differ due to the inhibitory component of the challenge used. Future research is needed to account for these mixed findings.

131) Abstract 1735
AMBULATORY BLOOD PRESSURE MEASUREMENT AND SLEEP QUALITY IN HEALTHY ADULTS
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Background: Ambulatory blood pressure monitoring (ABPM) is often conducted in concert with assessment of sleep quality in behavioral medicine research. Using this approach requires frequent inflation of a BP cuff throughout the night. There is little prior research concerning the effects of ABPM on sleep quality vs. nights without ABPM, nor of important individual difference variables.
Methods: The study included 124 healthy, normotensive adults (62% Female, M_{age}=33.15±10.56, 60% White) recruited for a study concerning sleep, stress, and arterial stiffness. Objective sleep data were obtained using wrist actigraphy (Actiwatch 2) over a seven-day period. During Day 6, ambulatory blood pressure (ABP) was assessed every 30 m for 36 h. Sleep indices (i.e., sleep onset latency (min.), sleep fragmentation [% of restless sleep], and sleep efficiency [% of time asleep while in bed]) were derived from actigraphy and averaged across the six days without ABPM and compared with the same indices recorded during the night with ABPM. The effect of ABPM on sleep indices was first assessed using within-subjects repeated-measures general linear models (GLM), controlling for age, sex, race, smoking status, SES, and symptoms of insomnia (via the Insomnia Severity Index). Effects of age and sex were examined in post-hoc analyses.
Results: There was a significant within-subjects effect of Time indicating that participants experienced greater fragmentation (F(1,117)=6.57, p=.012; No ABPM: 30.54% vs. ABPM: 31.97%) and worse sleep efficiency (F(1,117)=4.45, p=.037; No ABPM: 82.48% vs. ABPM: 82.36%) on the night with ABPM. There was no effect of ABPM on sleep onset latency (F(1,117)=3.26, p=.074; No ABPM: 14.69 min vs. ABPM: 16.50 min). Examining between-subjects effects of age and sex revealed a Time*Sex interaction whereby women had more restless sleep than men on the night with ABPM (F(1,117)=7.46, p=.007; $Delta_{Women}$:+1.29% vs. $Delta_{Men}$:-1.06%).
Conclusions: Findings demonstrate that objective sleep quality can be disturbed by ABPM. This represents a potential confound when ABPM and sleep monitoring are performed concurrently. Sex and other individual differences may also contribute to variation in sleep quality that is attributable to ABPM. Future studies are required to determine optimal methods for ambulatory measurement of sleep and related-health factors such as BP.

132) Abstract 1603
EFFECTS OF PARTICIPANT-SELECTED MUSIC VS. RESEARCHER-SELECTED MUSIC DURING COLD PRESSOR PAIN ON AUTONOMIC NERVOUS SYSTEM ACTIVITY
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Background: Listening to music has emerged as a potent and easily applicable means of stress reduction. The question has arisen whether it makes a difference if participants choose music to their own liking or if investigators select the musical stimuli. In this study, we set out to investigate whether the stress response of the autonomic nervous system (ANS) to the cold pressor test (CPT) differs if participants listen to self-selected or investigator-selected music. Based on the literature on potential gender differences in ANS responses to pain stimuli, we assumed that men and women would differ in their ANS responses.

Methods: On three separate occasions (separated by at least one day), 62 participants (age: $M = 24.2$, $SD = 3.85$, 30 male, 32 female) listened to their favourite relaxing song, a researcher-selected relaxing song, and the sound of lapping water during the CPT (random order) in a controlled laboratory environment. Heart rate (HR) and heart rate variability (HRV) parameters (RMSSD, LF, HF, LF/HF ratio) were measured before (during a baseline rest period and immediately before the CPT), during and after (immediately after the CPT and during a recovery phase) the CPT. Mixed-effects models were tested.

Results: Final analyses of HRV parameters are still in preparation. Preliminary analyses ($n = 24$) resulted in no group differences in RMSSD and LF/HF ratio at any time point. Immediately after the CPT, HR was higher in the condition with participant-selected music compared to the condition with researcher-selected music. HF and LF differed between conditions at baseline only. Men showed higher values in LF/HF ratio than women at baseline. No further gender effects were found.

Conclusions: The greater HR after the CPT in the participant-selected music condition points toward an attenuated stress reduction. However, HRV indices do not support this finding. Gender analyses indicate that men and women do not differ in their ANS responses during and after CPT. Importantly, these results are based on preliminary analyses in only a sub-set of the sample. Final analyses will be presented at the conference after the preparation of all data sets. The findings will inform research decisions on whether to include self-selected or investigator-selected music in future studies on the effects of music on stress reduction.

133) Abstract 1485

CARDIORESPIRATORY RESPONSES TO STRESS INDUCTION AS PREDICTORS OF TREATMENT SUCCESS IN PATIENTS WITH SYMPTOMS OF ANXIETY, DEPRESSION, AND STRESS

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Background: Respiratory responses to stress have remained largely unexplored as predictors of biobehavioral treatment success in patients with symptoms of anxiety, depression, and stress. Responses to standardized stress exposure can provide vital information on maladaptive breathing patterns as they has been observed in panic and other anxiety disorders. This study aimed to investigate breathing patterns to stress exposure in general anxiety, depression, and stress, and examine their potential role as predictors of biobehavioral treatment success.

Methods: Thirty patients were recruited for a treatment trial comprising of two psychotherapies: positive affect treatment (PAT) or negative affect treatment (NAT). Prior to treatment, patients completed a mental arithmetic test (MAT) with comparison to a fictive social norm. Scores on the subscales of the Depression Anxiety Stress Scale (DASS, Lovibond & Lovibond, 1995) were studied as moderators of heart rate and the respiratory pattern, measured continuously by the electrocardiogram and by respiratory inductive plethysmography. Treatment outcomes for nineteen patients were examined after the completion of all 15 weeks of treatment. Minute ventilation and expiratory volume were studied as moderators of treatment success in PAT and NAT conditions.

Results: Patients high on the DASS-stress subscale showed steady increases in minute ventilation across the baseline, task and recovery periods, whereas those low in stress showed the opposite patterns. This was mostly due to increases in expiratory volume, tidal volume variability as a parameter sensitive to sigh breaths, and increases in respiration rate, specifically due to reduction in expiratory time. Patients with higher levels of minute ventilation and expiratory volume benefited more from NAT than PAT condition and demonstrated faster improvement.

Discussion: Patients high in general distress (characterized as over-aroused, tense, and/or irritable) are likely to over-breathe when confronted with a stressor by increasing their minute ventilation and expiratory volume. Patients demonstrating patterns suggestive of over-breathing benefited more from one type of therapy that focuses on decreasing or eradicating negative coping and breathing training. Examination of breathing patterns induced by stress can contribute to biobehavioral treatment of these patients.

134) Abstract 1303

BLUNTED CARDIAC RESPONSES TO ACUTE PSYCHOLOGICAL STRESS ARE ASSOCIATED WITH INCREASED RISKY BEHAVIOR ON THE GAME OF DICE TASK.

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Background: Blunted cardiac reactions to acute psychological stress are associated with a host of adverse health and behavioral outcomes, such as greater impulsivity and antisocial tendencies. It has been proposed that blunted cardiac reactors are more likely to engage in risky behavior. However, there has been minimal research examining the association between cardiac stress reactivity and behavioral responses to established risk taking tasks in the laboratory.

Hypothesis: We hypothesized that diminished cardiac reactivity would be associated with greater propensity for risk taking on a standardized behavioral task that measures attraction to risky decision making.

Method: 78 participants (Mean (SD) [range] age = 25.6 (9.9) [18-62] years; 50.7% Caucasian, 20% Hispanic, 17.3% Asian, 6.7% African American, 5.3% Mixed; 67.9% female) completed a 10-minute baseline rest and a 10-minute mental arithmetic task (Paced Auditory Serial Addition Test). Heart rate (HR) was measured every 2 minutes throughout the baseline and PASAT periods. Reactivity was difference between average stress and average baseline values. Participants also completed the Game of Dice Task, which measures risky and safe betting behaviors. Safe betting choices were bets placed when the probability of winning was at 50% or higher and risky bets were bets placed when the probability of winning was at 50% or lower. Risk taking behavior was the difference between safe and risky betting behavior.

Results: Participants with higher HR reactivity tended to take fewer risks, $\beta = 0.256$, $t = 2.137$, $p = 0.036$, $R2 = 0.238$. After adjustment for further covariates (e.g., baseline HR activity, gender), results remained unchanged ($p < .05$).

Conclusions: Results are consistent with the notion that blunted cardiac stress reactivity is associated with an increase in risky behaviors. This implication is important for further studies linking blunted cardiac stress reactivity to poor decision making and subsequent adverse health outcomes (e.g., addiction, obesity). It could be possible that measuring cardiac reactivity may be a way to identify individuals most at risk for addictive behaviors and poor impulse control.

135) Abstract 1829

THE DYSFUNCTION IN FUNCTIONAL DISORDERS

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Background: Consider how each specialty of medicine cares for what it calls a "functional disorder." We apply this euphemism to syndromes that burden our patients with suffering and loss of function but defy our notions of pathology: psychogenic non-epileptic seizures, functional tremors, fibromyalgia, atypical chest pain, and irritable bowel syndrome, to name a few. Functional disorders lack measurable structural or physiologic deficits, given our current clinical tools, but they require a substantial amount of attention and resources from the healthcare system, frustrating patients and their clinicians equally.

Method: This narrative review examines the evidence for stress response system dysregulation across each of the major functional disorders and argues for consideration of a term that better reflects this dysregulation. It compares the evidence for effective treatments across functional disorders.

Results: With a few variations in adjunctive medications specific to the organ system of interest, the essentials of treatment for most functional disorders, regardless of the specialty diagnosis, consist of a) cognitive behavioral therapy, b) antidepressant/antianxiety medications, c) graded exercise or physical therapy, and d) meditation or relaxation techniques.

Discussion: This finding that "functional disorders," in spite of their different signs and symptoms and courses, respond to a shared set of treatments points to a possible shared dysfunction. Most of the difficulties in functional disorders are associated with dysregulations of the stress response system, specifically sympathetic hyperactivity and insufficient parasympathetic activity, or autonomic imbalance. The standard treatments, when delivered in high enough doses for long enough periods, reregulate multiple aspects of the stress response system, such as resting heart rate, heart rate variability, low-grade inflammation, blood pressure, sleep rhythms, and emotion processing in relation to motor activity. Recent progress in stress neuroscience calls for a reevaluation of the way we understand "functional disorders," and possibly a new term that better reflects the shared dysregulation of the stress response system.

136) Abstract 1046

BLUNTED BLOOD PRESSURE RESPONSES TO ACUTE STRESS PREDICT LOW BEHAVIOURAL PERSEVERANCE.

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Background: Poor behavioural regulation is associated with attenuated cardiovascular stress reactions. However, only a small number of behaviours, such as impulsivity and risk taking, have been explored, although one opportunistic study suggested that low perseverance may also related to blunted reactivity. The present study aimed to investigate the relationship between perseverance and cardiovascular stress reactions in more depth by examining both self-reported and behavioural perseverance and cardiovascular reactivity to acute stress.

Method: Participants (N=64; 77% female; 81% white) completed a self-report perseverance questionnaire before heart rate (HR) and blood pressure (BP) were measured at rest and in response to 4-minute mental arithmetic and cold pressor (CP) stress tasks followed by an unsolvable puzzle tracing task. The time taken and number of puzzle attempts were recorded as behavioural perseverance measures.

Results: Low behavioural perseverance, but not self-reported perseverance, was associated with blunted BP reactivity to the PASAT, and blunted BP and HR reactivity to the CP task (all $p \leq .05$). Following adjustment for potential confounders (gender, occupation, BMI) including spending at least two minutes in the CP water, fewer puzzle 4 attempts predicted blunted PASAT SBP and DBP reactivity, and CP SBP, DBP and HR reactivity, and time taken on the puzzle was significantly and positively correlated with PASAT DBP reactivity and CP HR reactivity.

Conclusion: These findings add to the evidence which implicates blunted reactivity as a marker for poor behavioural regulation, which may have prognostic implications for identifying those with unconscious deficiencies in perseverance.

137) Abstract 1604

BASELINE FATIGUE SEVERITY PREDICTS INFLAMMATION INDUCED AUTONOMIC HYPERACTIVITY AND PAIN SENSITIVITY IN FIBROMYALGIA AND ME/CFS

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INTRODUCTION

Fibromyalgia and ME/CFS are chronic, disabling and often poorly understood conditions, with overlapping systemic symptoms that cross body and brain. Orthostatic intolerance, such as Postural Tachycardia Syndrome, has been demonstrated in both Fibromyalgia and ME/CFS. How dysautonomia relates to symptom severity, pain and inflammation in these populations remains to be investigated. This on-going study seeks for the first time to clarify how pain, fatigue and autonomic hyperactivity are modulated by an inflammatory challenge.

METHODS

At present, 12 participants with reported diagnoses of Fibromyalgia or ME/CFS have been recruited, and screened according to ACR Diagnostic Criteria for Fibromyalgia and Canadian/Fukada Criteria for ME/CFS. Ten met both criteria for ME/CFS and 9 met ACR Criteria for Fibromyalgia. Participants have been tested under two conditions on separate visits: inflammatory state (typhoid vaccine) and placebo (saline).

Active Stand (AS) tests to determine orthostatic intolerance and autonomic hyperactivity, and Pain Pressure Threshold (PPT) to determine pain sensitivity were completed. The outcomes of change in heart rate (HR) from supine to 1-minute post-standing and change in PPT from baseline to post-injection were measured. Fatigue Severity Scale (FSS) was assessed prior to testing. Two-tailed Pearson correlation tests were used to assess for statistically significant associations.

RESULTS

The inflammatory influence on autonomic hyperactivity was demonstrated in this Fibromyalgia and ME/CFS population. The difference between typhoid and placebo test conditions in change of HR during AS correlated significantly to the pre-test FSS (r=0.601, p=0.036) (Figure 1).

Additionally, change in PPT between the two test conditions correlated significantly with pre-test FSS (r=-0.782, p=0.002) (Figure 2). This demonstrates that under the inflammatory condition, pre-test fatigue severity is associated with an increase in pain sensitivity.

DISCUSSION

Preliminary results demonstrate an association of pre-test fatigue severity to sympathetic hyperactivity and pain sensitivity induced by an inflammatory state.

CONCLUSION

Continuing research will investigate the relationship between dysautonomia, pain and fatigue severity in Fibromyalgia and ME/CFS. Understanding these physiological mechanisms is crucial for targeting future therapeutic interventions.

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138) Abstract 1613

EXAMINING THE ASSOCIATION BETWEEN HEART RATE VARIABILITY AND SELF-REPORTED SUBSTANCE USE

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In recent years, alcohol and drug abuse have become increasingly prominent in the United States population. Previous research has found that substance abuse is correlated with low inhibitory control. Studies have also shown an association between alcohol abuse and resting vagally mediated heart rate variability (HRV), a psychophysiological index of inhibitory control and health. Specifically, lower resting HRV is considered a risk factor for alcohol abuse. However, compared to alcohol abuse, there is little research relating drug abuse to vagally mediated HRV at rest. The current study examined the possible association between HRV at rest and problematic drug use. The Drug Abuse Screening Test (DAST) is a self-reported measure that evaluates an individual's likelihood of having a substance use disorder. Given that low resting vagally mediated HRV is associated with low inhibitory control and inhibitory control is directly related to DAST scores, vagally mediated HRV may reveal a similar correlation with DAST scores.The present study examined 87 undergraduate participants (mean age = 20.21, SD = 3.05, 53% female, 56% minority). HRV was measured using the natural log of the root mean square of the successive differences (lnRMSSD). Responses on the DAST-10 were coded (yes=1 and no=0) and total scores were calculated for analysis. Among participants scoring below the clinical cutoff, there was a significant negative correlation between vagally mediated HRV and DAST total score (Spearman's rho = -0.237, p = 0.043). Furthermore, this relationship was particularly strong among participants identifying as ethnic minorities (Spearman's rho = -0.334, p = 0.030) compared to Caucasian participants (Spearman's rho = -0.047, p = 0.810) and women (Spearman's rho = -0.384, p = 0.016) compared to men (Spearman's rho = -0.094, p = 0.598). Overall, results suggest that resting HRV may also serve as a physiological predictor of increased substance use, similar to alcohol abuse. Moreover, these data support previous evidence of the importance of compensation, marked by greater resting HRV, in women and ethnic minorities (e.g., African Americans) compared to their respective counterparts. Limitations and future directions will be discussed.

139) Abstract 1737

THE DIFFERENTIAL EFFECT OF SEX ON THE RELATION BETWEEN RESTING HEART RATE VARIABILITY AND TRAIT ANXIETY

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Research has shown resting heart rate variability (HRV) to be a general indicator of self-regulatory capacity, as well as a potential index of vulnerability to stressors. A few studies have found relations between trait anxiety and resting HRV such that individuals higher in trait anxiety display lower resting HRV. Interestingly, when assessing sex differences in HRV, women show higher resting HRV compared to men (Koenig & Thayer, 2016). As sex differences are well documented with regards to prevalence of anxiety disorders, it is important to assess how sex differences may play a role in the relation of resting HRV to trait anxiety. In fact, a recent report proposes that the association between resting HRV and psychological variables should routinely split by sex (Williams et al., in press). However, to date, studies have not assessed how the association between resting HRV and trait anxiety may differ based on sex. This relation was explored in the current study in a sample of 336 subjects (178 females, mean age = 19.5). Resting HRV was assessed utilizing electrocardiogram during a 5-minute-resting period and quantified using root mean square of successive differences. Sex was assessed via self-report, and self-report scales of trait anxiety were collected via the Trait Anxiety Inventory (Spielberger, 1989). Resting HRV was negatively associated with trait anxiety in both groups (r=-.204, p<.001), however this relationship was only significant in women (women r=-.272, p<.001, men r=-.145, p=.069). While these relationships were not significantly different from each other, these findings emphasize the importance of assessing sex differences in known correlates with HRV. It is possible that what previous studies have found regarding the relation between trait anxiety and HRV is at least partially driven by the strength of the effect in women. Thus, future studies should assess how sex may differentially contribute to associations between HRV and psychopathology to determine confirm this finding in anxiety and potentially with other symptoms of psychopathology.

140) Abstract 1253

PERCEPTIONS OF STRESS PRE- AND POST-TASK AND STRESSOR-EVOKED HEART RATE RESPONSES

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Background: Perceptions of stressfulness can be related to cardiovascular measures of physiological arousal, such as heart rate (HR). Research investigating the association between self-report stress ratings of an acute psychological stress task and stressor-evoked HR responses has produced inconclusive results. Some studies demonstrated a weak association between self-report stress ratings and HR responses during stress tasks, while others found no relationship. Previous research has typically included post-task ratings of perceived stress, but there is a scarcity of studies that report antecedent ratings of stress in relation to HR reactivity.

Aim: To examine if pre-task and post-task self-report ratings of stress are associated with stressor-evoked HR responses.

Method: Seventy participants [mean age (SD) = 26.52 (10.46) years, 77.1% female, 52.9% Caucasian] completed two standardized acute stress tasks (mental arithmetic and cold pressor) while HR was measured during a 10-minute baseline and during each task. HR reactivity was derived for each task separately (task - baseline). Participants rated subjective feelings of stress both immediately prior to and after completing each stress task on a 7-point Likert scale (1 = Not at all stressed; 7 = Extremely stressed).

Results: Regression analyses indicated that, for the cold pressor, there was a significant positive correlation between participants' self-reported stress before the task and HR reactivity (β = 0.41, t = 3.67, p < .001, ΔR2 = 0.171); there was no significant relationship between HR reactivity and post-task stressfulness. Similarly, there were no significant relationships between pre-task or post-task stressfulness and HR reactivity during the mental arithmetic task.

Conclusion: Perceptions of stress prior to completing the cold pressor task were associated with subsequent HR reactivity during the task; however, there were no associations between perceptions of stress prior to the mental arithmetic task and HR reactivity. It is possible that perceptions of stress preceding a task where the participant has little control can influence subsequent physiological responses. There were no associations between post-task ratings of stress and HR reactivity. Future research should aim to measure perceptions of stress both before and after stress exposure and measure perceptions of control over the stressor.

141) Abstract 1694

THE EFFECT OF LONG-TERM VAGUS NERVE STIMULATION ON COGNITIVE FUNCTION: RANDOMIZED PLACEBO WAITLIST-CONTROLLED TRIAL (A STUDY PROTOCOL)

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Background and objective: There is a great need to explore possible mechanisms of cognitive aging as well as new therapeutic methods. Multiple studies suggest that autonomic nervous system with decreased vagal modulation may play an etiological role in cognitive function changes. Therefore we investigate the effect of a non-invasive and safe transcutaneous vagal nerve stimulation (tVNS), an intervention that should have a direct influence on brain systems underlying cognitive changes, in a longitudinal randomized placebo waitlist-controlled design in healthy adults.

Methods: Sixty healthy men and women aged 18-60 are randomly assigned to one of four groups: early tVNS group; early sham tVNS group; late tVNS group and late sham tVNS group (Figure). The intervention period (tVNS or sham tVNS) lasts 2 weeks with 4hours of stimulation time every day. Sham stimulation is performed using electrodes placed on earlobe. The control condition is the 2 weeks waiting/or follow up period. All cognitive and physiological measurements are acquired three tímes in 2 weeks intervals (preintervention, postintervention and control condition). We assess the following cognitive constructs using sensitive and reliable tests with minimal practice or learning effects: short-term and long-term memory (Rey Memory Test), working memory (Nback), cognitive flexibility (Set-shifting), response inhibition (Flanker test) and emotion recognition (ERT). We record heart rate variability in supine position and during the cognitive challenge. Health, lifestyle and psychological questionnaires are administered in Qualtrics at each laboratory day (preintervention, postintervention and control condition) and short questions on sleep, daily stressors, affect, perceived stress, physical activity, life satisfaction, depression etc. on daily and weekly basis.

Hypothesis: We expect transcutaneous vagus nerve stimulation to enhance cognitive performace compared to placebo and waitlist-control condition.

Data collection is underway (in progress)

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142) Abstract 1309

ADDICTION RISK AND PSYCHOSOCIAL PREDICTORS OF CORTISOL STRESS REACTIVITY IN THE FAMILY HEALTH PATTERNS PROJECT

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Background: The Family Health Patterns project (FHP) seeks to identify biological and temperament characteristics that may affect risk for substance use disorders. Prior work showed that stress reactivity was predicted by psychosocial variables including early life adversity and temperament. We have examined a larger data set for predictors of cortisol stress reactivity including psychological, cognitive, and behavioral characteristics thought to be relevant to motivated behavior and addiction.

Methods: Cortisol Stress reactivity was measured on 731 healthy young adults, (Men =320; Women = 411; M Age = 23.7 SE = 3.4) 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. Psychosocial variables were collected via clinical interviews and surveys. A general linear model was conducted including all variables that initially correlated with log transformed cortisol reactivity.

Results: Initial univariate tests found that cortisol reactivity was significantly correlated with early life adversity score, mental age, neuroticism, reward dependence, delay discounting, and behavioral choice consistency during the Iowa Gambling Task. In a subsequent muiltivariable model, cortisol reactivity was negatively related to Cloninger's reward dependence score ($F = 9.23$, $p = .0025$) and positively related to choice consistency behavior on the Iowa Gambling Task ($F = 5.67$, $p = .0175$).

Conclusion: Cortisol reactivity was related to temperament and behavioral characteristics associated with addiction risk. Reward dependence reflects attention to gains rather than avoidance of losses. Choice consistency reflects selection of choices based on experience of prior outcomes. Both measures suggest that, cortisol stress reactivity is related in part to a balance of approach to rewards and avoidance of negative outcomes. Regulation of the stress axis is accordingly tied to motivation and behavioral choices in relation to risk taking.

143) Abstract 1293

COURT SIDE HEART RATE VARIABILITY AS A MARKER OF PSYCHOBIOLOGICAL STRESS IN ELITE JUNIOR TENNIS PLAYERS IN VENEZUELA

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Background:There is clinical evidence outlining the specificity and sensitivity of Heart Rate Variation(HRV)in assessing the reduction of parasympathetic activity in anxiety.We focused on elite tennis players and their psychological state.Our aim was to examine the changes in their HRV, stress and anxiety.Method:12 junior elite tennis players 6 girls and 6 boys,12 to 16 years old underwent evaluations including Heart Rate,Respiratory Rate,Blood Pressure, Pulse oximetry,measurement of HRV parameters using a Chest Electrode Polar S810i Cardiomood 30 minutes prior to and post-match.A Holmes a Rahe Scale and Beck Anxiety Inventory were also administered.A determination of the HRV was performed before and after a practice session. Results/Conclusion:Psychosocial Stress measured by the Holmes and Rahe Scale was high (>250 points) in 17% of players. Anxiety on the day of competition measured by the Beck Anxiety Inventory was present in 83% of the players.The precompetitive mean value of the Heart Rate Variability (HRV) using the Proportional Differences of more than 50% of RR (PNN50%) was 20.42% as compared with the post-competitive mean value of 11.3%. Winners had a (HRV) of 11.3% as compared with those who lost who had an HRV of 5.2%.This suggested that those who lost had an elevated sympathetic tone as compared with the winners.On training day, HRV values average 19% (PNN50%), which was more than double that of a competition day of 8.8% ($p<0.05$), suggesting that the day of a competition the players have a higher sympathetic tone.Psychosocial Stress was elevated in 17% of players while anxiety was present in 83% of players on competition day suggesting anxiety was related to the tournament.HRV postcompetition was double than the pre-competitive, suggesting that matches represented challenges that altered Sympathetic/Parasympathetic equilibrium.Those losing matches demonstrated an HRV of 5.2% as compared with winners

having an HRV of 11.2% suggesting that those losing matches suffered sympathetic tone elevation.The use of these psychological and biometric tests at the court side is a practical method to assess Psycho-physiological Distress in Junior Tennis Players.

144) Abstract 1661

DISPOSITIONAL OPTIMISM AND CARDIOVASCULAR REACTIVITY TO TASKS VARYING ON DIFFICULTY

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Previous work examining dispositional optimism and cardiovascular reactivity to stress has produced mixed findings, with some studies finding optimism to be associated with attenuated reactivity (e.g., Williams et al., 1990), some finding optimism to be associated with increased reactivity (e.g., Nes et al., 2005), and some finding no association between optimism and reactivity (Terrill et al., 2010). The current study investigated whether the relation between optimism and autonomic reactivity to stress was moderated by task difficulty. This study employed a quasi-experimental design in which participants were classified as optimists (n = 74) or pessimists (n = 78) based on the Life Orientation Test-Revised. Participants were randomized to complete either an easy or difficult Raven's Matrices task. Blood pressure (systolic, diastolic, mean arterial), heart rate, and heart rate variability were measured during a pre-task rest period, the 5-min task period, and a 5-min recovery period.

Results revealed that optimists exhibited greater diastolic blood pressure reactivity to both the easy and difficult stress tasks compared to pessimists,$F(1, 143) = 5.82$, $p = .017$, $\eta_p^2 = .039$. Analysis of affective responses to the tasks showed that optimists reported experiencing more positive affect and less negative affect than pessimists during the laboratory session, ($p < .001$ and $p = .039$, respectively). However, there were no differences between optimists and pessimists on task performance, pre-task ratings of self-efficacy, and ratings of task difficulty, stressfulness, discomfort, or perceived effort. In contrast, optimists reported perceiving that they performed better than pessimists ($p < .001$) and that they were more persistent in completing the task ($p < .001$). Although the hypothesized moderation effect was not observed, study findings added credence to Carver and Scheier's Behavioral Self-Regulation Model that predicts that optimists may engage more fully with laboratory tasks than pessimists, and consequently, experience greater DBP reactions during the task period than pessimists.

145) Abstract 1498

PSYCHOPHYSIOLOGICAL PREDICTORS OF STRESS INDUCED MITOCHONDRIAL REACTIVITY IDENTIFIED USING MACHINE LEARNING CLASSIFIERS

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Objective: We have previously reported that induced psychological stress increases serum circulating cell-free mitochondrial DNA (ccf-mtDNA). As for other aspects of stress reactivity, there are substantial and unexplained inter-individual differences in the magnitude of ccf-mtDNA response, as well as within-person differences across different occasions of testing. Here, we sought to identify psychological and physiological predictors of stress induced ccf-mtDNA reactivity using machine learning-based multivariate classifiers.

Methods: Serum ccf-mtDNA concentration was measured before and after socio-evaluative stress in 46 healthy midlife adults on two different sessions. Our goal was to explore potential variables predicting the magnitude of ccf-mtDNA reactivity while avoiding the multiple testing issue associated with classic inference-based statistical approaches. Therefore, we used two mathematically independent multivariate classification models: partial least-squares discriminant analysis (PLS-DA) and random forest (RF). Models were trained to discriminate between high and low ccf-mtDNA responders using 56 psychological and physiological variables. Variables selected from both models were considered as predictors and examined in bivariate analyses. Finally, we tested if group-level predictors can account for divergent responses in participant who show low and high responses on different sessions.

Results: Identified predictors of ccf-mtDNA reactivity were enriched for state over trait measures (X2=7.03; p=0.008) and for physiological over psychological measures (X2=4.36; p=0.04). High ccf-mtDNA responders were more likely to be male (X2=26.95; p<0.001) and differed from low-responders on baseline cardiovascular and autonomic measures, and on stress-induced reduction in fatigue (Cohen's d=0.38-0.73). For participants exhibiting divergent responses across sessions, state measures accurately predicted the magnitude of ccf-mtDNA reactivity in 90% of cases.

Conclusion: Our suggest that stress-induced ccf-mtDNA reactivity is predicted by variable cardiovascular and psychological indices rather than stable individual traits. Our findings provide a proof-of-concept that machine learning approaches can be used to explore determinants of between- and within-person differences in psychophysiology.

146) Abstract 1743

AN UPDATE ON ETHNIC DIFFERENCES IN IMPEDANCE CARDIOGRAPHY: A FOCUS ON INOTROPIC INFLUENCE

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Research suggests African Americans (AAs) have both greater resting sympathetic (SNS) activity (e.g., greater blood pressure) and greater resting parasympathetic (PNS) activity (e.g., greater resting high-frequency heart rate variability |HF-HRV) compared to European Americans (EAs). This counterintuitive pattern of results has been termed the *cardiovascular conundrum*. However, little is known of ethnic differences in central cardiac sympathetic autonomic regulation. In this regard, we recently found higher left ventricular ejection time (LVET), pre-ejection period (PEP), and HF-HRV in 35 AAs compared to 113 EAs as further evidence for the conundrum. Importantly, we showed AAs to have higher cardiac autonomic regulation (CAR), or coactivation of the SNS and PNS, compared to EAs. The current investigation re-examines these results in a larger sample of participants and uses both LVET and PEP multiple methods to calculate CAR. All physiological measures including resting HF-HRV, root mean squared of successive differences (RMSSD), PEPs, and LVETs, were taken using a 5-minute baseline period. Resting HF-HRV was available for the total sample of 554 undergraduate students (134 AAs, 420 EAs), while impedance cardiography data was available for a subset of our sample (150 EAs, 64 AAs). Cardiac autonomic regulation (CAR; co-activation/inhibition of PNS and SNS) was calculated using both PEP and LVET individually. Equations include (1)CAR_PEP = zRMSSD + (-zPEP) and (2) CAR_LVET = zRMSSD + (-zLVET). Results showed that in the full sample, AAs had higher resting HF-HRV in comparison to EAs ($t(552) = -2.61$, $p = .009$). AAs also showed shorter PEPs ($t(207) = 2.17$, $p = .031$) compared to EAs, but there was no significant difference in LVETs ($t(207) = 1.05$, $p = .294$). AAs showed significantly greater CAR_PEP ($t(207) = -2.78$, $p = .006$) compared to EAs, whereas ethnic differences in CAR_LVET did not reach statistical significance ($t(200) = -1.73$, $p = .086$). Overall, results provide support for the *cardiovascular conundrum*, showing greater PNS activity (i.e., HF-HRV) *and* greater SNS activity (i.e., quicker PEPs) compared to EAs. Importantly, these results extend our previous preliminary data,

suggesting that inotropic influence, as marked by greater PEPs and CAR_PEP specifically, may be particularly influential in ethnic health disparities.

147) Abstract 1787

CONDITIONING CORTISOL AND ITS PSYCHOPHYSIOLOGICAL EFFECTS

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Background: Conditioning of physiological responses by repeatedly pairing a previously neutral conditioned stimulus with the administration of a pharmacologically salient unconditioned stimulus has been effective for specific immune and endocrine responses, but results with regard to conditioning of cortisol are currently unclear. The aim of this study was to build on previous cortisol conditioning studies by investigating the possible effects of cortisol conditioning not only under basal conditions, but also in response to stress. As cortisol is a key stress-regulatory parameter, successful conditioning of cortisol might not only provide new insights into the central regulation of the Hypothalamic Pituitary Adrenal (HPA) axis, it might eventually also provide new ways to address dysregulation of the HPA axis in clinical settings, where it may become a valuable addition to existing treatment options for stress-related disorders.

Methods: A double-blind randomized controlled trial was conducted in 48 healthy female volunteers. During the acquisition phase, a gustatory stimulus (conditioned stimulus) was paired with hydrocortisone (100 mg, capsulated, unconditioned stimulus) three times before being administered together with placebo during three evocation sessions. To investigate possible effects of cortisol conditioning in response to stress, participants were exposed to the Trier Social Stress Test during the third evocation session. Primary outcome measure of this study was salivary cortisol. As secondary outcomes, self-reported affect and stress as well as alpha-amylase, heart rate and skin conductance were investigated.

Results: Data collection for this study has been finalized and data analysis is currently underway.

Discussion: This study provides an innovative opportunity to examine the effects of cortisol conditioning on cortisol levels under basal conditions and in response to stress. Additionally, the possible psychophysiological effects of cortisol conditioning under basal and stress conditions are investigated. If cortisol could successfully be conditioned, this would be of conceptual relevance, showing that HPA axis regulation can be influenced by associative learning processes. Eventually, this could also have important clinical implications for understanding and treating stress-related disorders in which HPA axis dysregulation might play a role.

148) Abstract 1073

SEX DIFFERENCES IN PERCEIVED STRESS AND CORTISOL LEVELS IN A COHORT OF AFRICAN AMERICANS

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Health disparities among African Americans have become a growing concern in recent years, with reported sex differences in rates of life expectancy, health risk factors, and chronic illnesses. Psychological stress and cortisol response have independently been shown to be predictors for health outcomes, with repeated or additional exposure to stress resulting in the dysregulation of cortisol release and an increased risk of mortality and morbidity. African Americans are frequently and disproportionately exposed to various psychosocial and environmental stressors, suggesting that they may be more susceptible to negative health outcomes. While there is some literature on the impact of stress appraisal and response on overall health among African-Americans, few studies have explored sex-specific differences in the relationship between perceived stress and cortisol levels in this population. Thus, the current study aims to examine sex differences in the associations between salivary cortisol and self-reported levels of perceived stress among African-Americans. Cortisol data was gathered from a cohort of 95 African Americans (72 females, Mean age = 25.92). Participants also completed the Perceived Stress Scale (PSS), a 14-item battery comprised of 'Positive' and 'Negative' items that can represent perceived coping ability and perceived distress, respectively. Independent samples t-tests revealed significant differences in total perceived stress ($t(93) = -4.327$, $p \leq .001$), perceived coping ability ($t(93) = -4.072$, $p \leq .001$), and perceived distress ($t(93) = -3.513$ $p \leq .001$) across sex, with females reporting higher scores across all domains. T-test results also showed significant differences in salivary cortisol across sex, with males reporting higher levels ($t(81) = 2.159$, $p \leq .05$). Pearson's r correlation tests showed positive association between salivary cortisol and perceived coping ability in males ($r = .418$, $p = .075$) and negative association between salivary cortisol and perceived distress in females ($r = -.208$, $p = .098$) but they were not significant. These findings provide evidence for sex differences in perceived stress and cortisol levels among African Americans and call for the further exploration of sex-specific factors that drive these patterns that could explain the sex differences in health disparities within this population.

149) Abstract 1577

HOW DO WE FEEL OUR HEARTBEATS? THE POSSIBLE ROLE OF ARTERIAL BARORECEPTORS IN CARDIAC INTEROCEPTION

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Background: Interoception refers to the central processing of the internal state of the body. Heartbeat detection task is a common method being used for the 'objective' evaluation of interoception, i.e. the interoceptive accuracy. However, knowledge on the physiological basis of heartbeat perception is lacking. Arterial baroreceptors are assumed to be involved in cardiac interoception, but evidence to support this is limited. We aim to evaluate the role of arterial baroreceptors in cardiac interoception.

Methods: In experiment no. 1 with 30 healthy volunteers we found an association between baroreceptor sensitivity (BRS) and interoceptive accuracy (using the Schandry heartbeat detection task). To be able to control for possible confounding factors we repeated the experiment (no. 2) and studied another 30 healthy volunteers. Heart rate and beat to beat blood pressure were continuously recorded. Spontaneous BRS was measured using the sequence method. The Root Mean Square of the Successive Differences in inter-heartbeat intervals (RMSSD) was extracted as a measure of vagally-mediated heart rate variability. In addition, some of the potential limitations of the heartbeat detection task were evaluated qualitatively by questions about; the quality and location of the sensation of the heartbeats; whether the response was just based on guessing or real sensations, and whether participants were aware of their heart rate, to test if such knowledge is associated with the interoceptive accuracy.

Results: In experiment no. 1, interoceptive accuracy was significantly correlated with systolic blood pressure (SBP, $r = 0.388$), RMSSD ($r = 0.440$), and BRS ($r = 0.424$). Data of experiment no. 2 are yet to be analyzed. We will combine the two experiments and will run General Linear Models to evaluate the association between BRS and interoceptive accuracy while controlling for possible confounding factors such as gender, blood pressure, and heart rate.
Conclusion: Available data support a role for the arterial baroreceptors in cardiac interoception. Baroreceptor sensitivity may be considered a component contributing to interoceptive ability and, as such, a potential treatment target for improving interoception. Limitations of the heartbeat detection task will be discussed.

150) Abstract 1464
AUTONOMIC RESPONSE TO EXPERIMENTAL VISCERAL PAIN MAY DEPEND ON PAIN MODALITY
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Background: Pain experience can evoke autonomic responses which may be different according to pain modality and individual psycho-physiological traits. Autonomic responses to pain may in turn influence pain experience through interoceptive feedbacks. We investigated autonomic response to acute visceral pain induced by electrical stimulation of the distal esophagus.
Methods: Visceral pain was induced by electrical pulse trains (x5 square-wave pulses, 0.5 msec width, 200 Hz) in the distal esophagus (~35 cm from the nares). Moderate pain threshold was determined and defined as score of 5 out of 10 in a 11-point numerical rating scale (0 no pain, 10 most intense pain imaginable). Each participant received eight painful stimuli with random inter-stimulus interval of 45-55 seconds. Electrocardiography was continuously recorded and change in beat to beat intervals from before to after each stimulation (ΔRR-interval, detrended) was measured as autonomic response. Baseline psycho-physiological measures included heart rate variability indexes (mean RR-interval, Root Mean Square of the Successive Differences [RMSSD]), pain catastrophizing, and fear of pain.
Results: 45 healthy volunteers (30 Female, age 22.0 ± 4.1 year) were studied. Post stimulation RR-interval decreased in all participants (Δ -173 ± 86 millisecond); heart rate deceleration was not observed in any case. Factors associated with ΔRR-interval included perceived pain intensity ($F = 11.91$, $P = 0.001$) and Baseline RMSSD ($F = 10.5$, $P = 0.002$). Recovery time was on average 30 seconds after pain stimulation (Figure 1).
Conclusion: Visceral pain induced by electrical stimulation at distal esophagus provokes sympathetic activation/parasympathetic withdrawal, but not parasympathetic activation. This is in contrast to mechanically induced visceral pain which has been reported to evoke both parasympathetic activation and withdrawal, based on psychological traits. These differences in interoceptive reactions to pain may indicate stimulation of different receptors and activation of different afferent pathways based on stimulus modality which in turn may influence the pain experience. Finding of this study is of importance for studies investigating psycho-physiological responses to visceral pain as well as studies on the neurophysiological basis of visceral pain perception.

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151) Abstract 1465
CAN SLOW, DEEP BREATHING REDUCE VISCERAL PAIN?
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Background: Pain is a common reason patients turn to complementary/alternative therapies. A number of experimental studies have shown pain dampening effects of slow, deep breathing (SDB) using somatic pain models. Whether or not SDB can reduce visceral pain is not clear yet. We evaluated the effect of SDB on visceral pain perception, and explored possible mechanisms focusing on modulation of autonomic nervous system.
Methods: Visceral pain was induced by electrical stimulation in the distal esophagus. Moderate pain threshold was determined and defined as score of 5 out of 10 in a 11-point numerical rating scale (0 no pain, 10 most intense pain imaginable). Participants performed paced breathing at 0.1 Hz (SDB), paced breathing at 0.23 Hz (PB, active control), and normal breathing (NB), each for eight minutes, in a randomized order. Eight painful stimuli were delivered during each breathing condition. Heart rate variability (HRV) analysis was performed for the evaluation of autonomic responses. Baseline psycho-physiological measures included HRV (Root Mean Square of the Successive Differences [RMSSD]), pain catastrophizing, and fear of pain.
Results: 59 healthy volunteers (37 Female, age 22.1 ± 3.6 year) were studied. HRV analyses indicated higher vagal activity during SDB ($P < 0.001$), but similar between PB and NB ($P = 0.632$). Perceived pain intensity was lower during PB compared to NB ($P = 0.014$). However, there was no significant difference between SDB and PB ($P = 0.350$) or between SDB and NB ($P = 0.344$) in perceived pain intensity (Figure 1). There was no difference among breathing conditions in pain unpleasantness. Baseline RMSSD was associated with perceived pain intensity ($F = 17.11$, $P < 0.001$).
Conclusion: Slow, deep breathing is able to increase vagal activity, but has no influence on visceral pain perception induced by electrical stimulation in the esophagus. Paced breathing at 0.23 Hz decreases pain intensity which can be due to distraction and/or expectation. These results indicate that autonomic modulation by SDB may not be enough or necessary for reducing visceral pain. Future studies should focus on other components of SDB including emotional and cognitive dimensions. Evaluating the effect of SDB on visceral pain induced by mechanical stimulation is also warranted.

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152) Abstract 1658
ASSOCIATIONS OF SELF-REPORT AND ACTIGRAPHY SLEEP MEASURES WITH PAIN DISABILITY AND COPING IN AN INPATIENT REHABILITATION PROGRAM FOR CHILDREN WITH CHRONIC PAIN
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Self-report and objective (actigraphy) measures of sleep have been shown to differentially predict pain-related outcomes, but no study has compared these measures in their ability to predict functional disability or pain coping in an inpatient rehabilitation program for children with chronic pain. The current study used data from 23 children and adolescents (Mean age = 14.8, *SD* = 2.74, age range = 9-18) who were in an inpatient functional rehabilitation program for chronic pain. Children were in the program between 18 and 32 days (Mean days =

20.57, *SD* = 4.98). Self-report sleep measures related to sleepiness (Epworth Sleepiness Scale), sleep quality (Adolescent Sleep/Wake Scale), hygiene (Adolescent Sleep Hygiene Scale), and insomnia (Pediatric Insomnia Severity Index) were collected at program admission. Actigraphy sleep continuity measures (sleep latency, sleep duration, sleep efficiency, total sleep time, and wake after sleep onset) were collected by averaging data from an actigraphy watch worn over the first 7 nights in the program. Functional disability (Functional Disability Inventory) and pain coping (Pain Coping Questionnaire) were collected at admission and discharge and a difference score was computed. Results revealed significant improvement in disability ($M_{admission}$= 30.96, $M_{discharge}$= 12.30, $t(22) = 9.93$, $p < .001$) and pain coping over the course of the program ($M_{admission}$= 8.61, $M_{discharge}$= 10.87, $t(22) = -5.47$, $p < .001$). Self-report sleep measures were more strongly associated with improvements in functional disability and pain coping than actigraphy measures (average $b = .28$ vs $b = .09$ for functional disability; Average $b = .24$ vs. .20 for pain coping). The strongest associations were with poor sleep hygiene at baseline predicting improvements in disability ($b = .47$, $p = .035$). Measure-specific relationships will be discussed. This is the first study to compare self-report and actigraphy sleep measures for predicting disability or pain coping in an inpatient rehabilitation program for children with chronic pain, and highlights the value of assessing sleep subjectively at program admission.

153) Abstract 1519

INVESTIGATING INTRANASAL OXYTOCIN AS A TREATMENT FOR WOMEN'S CHRONIC PELVIC PAIN: A RANDOMIZED FEASIBILITY STUDY

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Background

Chronic pelvic pain (CPP) affects 6-27% of women in the general population and is characterized by poor prognosis and limited treatment options. Exogenous administration of oxytocin (OT) has been associated with reduced pain among individuals with chronic musculoskeletal pain. This abstract presents results of a feasibility study investigating the effect of OT on pain and function in women with CPP. Aims were to calculate the magnitude of effect of intranasal OT administration on pain and function relative to placebo and collect feasibility data pertaining to recruitment and study protocol implementation.

Method

Women with CPP were recruited from chronic pain and gynecology clinics for this randomized, double-blind trial (Registration#NCT02888574). The study protocol consisted of a baseline testing session and two intranasal administration periods where women self-administered OT or placebo nasal spray twice daily for 2-weeks. Nasal spray conditions were counterbalanced, separated by a 2-week washout period. Pain and function were recorded on daily diaries.

Results

Recruitment is ongoing, with 18 women enrolled, 11 completed, and data collection to be complete December 2018. One woman discontinued due to an adverse event following placebo administration, one did not complete daily diaries, and two were randomized despite having pain localized to intercourse. Seven women were included in analyses. Following 2-weeks OT clinically significant pain reduction (improvement of ≥1cm on a visual analogue scale) was reported for average (*M*(SD)=-1.3(1.0)) and current pain (*M*(SD)=-1.0(1.0)) but not worst or least pain. Following placebo clinically significant pain reduction was reported for average (*M*(SD)=-1.5(1.0)) and worst pain (*M*(SD)=-1.4(1.2)) but not current or least pain. Self-reported treatment adherence was excellent (99%). Participants viewed the treatment as credible, anticipating improved pain. Daily diary adherence was good (87%). Challenges with protocol implementation highlight need for more systematic eligibility and recruitment strategies, and the incorporation of electronic daily diaries.

Conclusions

Clinically significant change was detected on pain for both conditions, with little difference between OT and placebo. The treatment protocol was feasible. Some adjustments to the study protocol are warranted before completing a subsequent trial.

154) Abstract 1349

RESILIENCE FACTORS PREDICT RECOVERY FROM TOTAL KNEE REPLACEMENT (TKR): THE MISSING PIECES OF THE FEAR-AVOIDANCE MODEL OF PAIN

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Background: In response to painful experiences, The Fear-Avoidance Model suggests that patients take one of two paths resulting in dramatically different experiences. Fueled by catastrophizing thoughts and activity avoidance, some patients enter a downward spiral of depression and disability. This path consists of a detailed sequence of cognition, affect, and behaviors by which acute pain may become chronic. In contrast, the path to recovery within this model is less specific - stating only that patients have no fear and confront their pain. The purpose of the present study is to identify resilience factors that delineate a cognitive-affective-behavioral pathway to recovery, completing the missing pieces of The Fear-Avoidance Model. We hypothesized a model by which self-efficacy prior to surgery would enhance positive affect during hospitalization, leading to increased energy during activity engagement and better recovery at 1 and 3 months following surgery. **Method:** Participants were 110 TKR patients (68% female, M age=69.2yrs). Patients' self-efficacy was assessed 2 ½ weeks prior to surgery (Lorig, 1989), positive affect the day after surgery (Watson et al, 1988), vitality and vigor 1 month following surgery (Ware and Sherbourne, 1992; McNair et al, 1992). Patients' post-operative recovery was assessed 1 and 3 months following surgery (AIMS-2, Meenan et al., 1992). **Results:** Control variables included gender, pain, and depressive symptoms prior to surgery (CES-D, Radloff, 1977). Path analysis was conducted using hierarchical, multiple regression. Results reveal significant path coefficients leading from pre-operative self-efficacy to positive affect in-hospital (β=.246,p=.017), to vitality (β=.323,p=.001) and vigor (β=.387,p<.001) at 1 month following surgery. Both indicators of post-operative energy predicted better recovery at 1 and 3 months following surgery (1 mos: vitality β=-.254,p=.016; vigor β=-.329,p=.002); 3 mos: vitality β=-.192,p=.047, vigor β=-.201,p=.044). **Conclusion:** Findings support a cognitive-affective-behavioral pathway to recovery, characterized by self-efficacy, positive affect, vitality, and vigor. This resilience pathway counterbalances the downward spiral to chronic pain specified by The Fear-Avoidance Model. Further, the resilience pathway may suggest to clinicians strategies for encouraging recovery among chronic pain patients.

155) Abstract 1807

SOCIAL SUPPORT AND PAIN AMONG PERSONS WITH SPINAL CORD INJURY

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This study examined the role of perceived social support availability among people living with spinal cord injury (SCI). Consistent with spinal cord injury, all participants in our study were experiencing chronic pain symptoms. We examined pain catastrophizing, as it has been reliably associated with worse adjustment to chronic pain. We focused on understanding the role of support in mitigating the extent and impact of this maladaptive coping response to pain. We used an intensive longitudinal design that involved two brief phone interviews

conducted daily over 5 days. 97 participants were recruited into the study. Each participant was asked to nominate their primary caregiver for inclusion in the study as well. For all, social support received and provided was tracked over time via twice daily phone calls separately with both members of the dyad. Pain and pain catastrophizing were also assessed at each time point for participants with SCI. We found that support was associated with less pain catastrophizing overall and smaller increases in pain when catastrophizing did occur. Implications for people living with SCI and other chronic pain populations are discussed.

156) Abstract 1200

PSYCHOSOCIAL TREATMENT FOR CHRONIC PAIN AND PTSD: EVIDENCE OF MEDIATION AND CLINICALLY SIGNIFICANT CHANGE FOLLOWING INTERDISCIPLINARY PAIN REHABILITATION

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Background: Patients diagnosed with chronic pain and posttraumatic stress disorder (PTSD) report greater pain, distress and disability when compared to those with either chronic pain or PTSD alone. With comorbid medical and psychiatric illnesses affecting an increasing number of Americans each year, development of psychosocial treatment interventions that can simultaneously address commonly co-occurring conditions in an efficient manner is highly desirable. This study sought to examine the effectiveness of a 3-week, CBT-based interdisciplinary pain rehabilitation program (IPRP) among 71 treated patients with chronic pain and a provisional PTSD diagnosis.

Methods: Within-subjects ANOVAs were used to examine the pre- to post-treatment changes on self-reported pain outcomes (e.g., pain severity, interference, catastrophizing), depressive symptoms, and PTSD symptomatology (i.e. PCL-5). Reliable and clinically significant change analyses were performed on PTSD symptoms. Finally, within-subjects (repeated measures) mediational analyses were performed to evaluate whether changes in pain catastrophizing accounted for improvements in PTSD and pain outcomes beyond the influence of improvement in depressive symptoms.

Results: Statistically significant pre- to post-treatment improvements were detected for all outcome measures (F's > 50.00, p's $<.001$, $?p^2$'s $> .42$). Reliable change analyses revealed that 55% of patients reported reliable decline in PTSD symptomatology (i.e., change not due to chance). Of those patients, 87% no longer met criteria for a provisional diagnosis of PTSD at post-treatment. Lastly, mediational analyses revealed that improvements in PTSD symptomatology and pain severity was fully mediated by reductions in pain catastrophizing and depressed mood. Reductions in pain catastrophizing, but not depressed mood, fully mediated improvements in pain interference.

Conclusions: Results suggests that IPRPs that effectively reduce tendency to catastrophize in response to pain may not only enhance patients' functional status and reduce depressive symptoms, but also produce salutary effects on PTSD symptomatology. Interventions that assist patients in modifying catastrophic appraisals of pain may be critical to facilitating improvements in functional capacity and reducing PTSD symptom severity for individuals with comorbid chronic pain and PTSD.

157) Abstract 1739

CYTOKINES AND SYMPTOM BURDEN IN ADVANCED STAGE PROSTATE CANCER

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This abstract will present on data that has been collected but not yet been analyzed. Data analysis will conclude in December 2018, prior to the presentation at the 2019 APS scientific meeting. We therefore request that this be considered as a late-breaking abstract.

Background: With the increase in rates of cancer survivorship, particularly in both localized and advanced stage prostate cancer, psychosocial research is now focusing more on survivorship concerns such as symptom burden and quality of life. As neuroimmune regulation, including cytokines, has been shown to play a role in cancer-related symptoms such as fatigue and pain, it is becoming more important that we better understand the physiological pathways impacting various domains of symptom burden. This study aims to uncover relationships between urinary, sexual, bowel, and hormonal domains of symptom burden and both pro- and anti-inflammatory cytokines in advanced stage prostate cancer patients.

Methods: This analysis will be conducted on cross-sectional data collected from a diverse sample of advanced stage prostate cancer patients. Venous blood samples were collected and assayed for both pro- and anti-inflammatory cytokines. Symptom burden was measured using the Expanded Prostate Cancer Index Composite and will allow researchers to analyze symptom burden across multiple domains including urinary, sexual, and bowel functioning. In the analysis, cytokine values will be log transformed to account for their non-normal distribution. The relationship between individual cytokines and measures of symptom burden will be analyzed by calculating Pearson correlation coefficients while controlling for demographics, comorbidities, treatment type, and stage of cancer.

Hypothesized Results: Based on previous studies, we hypothesize that we will find significant relationships between the following: urinary functioning and both IL-1β and IL-6, fatigue and both IL-1β and IL-6, and a composite measure of symptom burden and both IL-1β and IL-6.

158) Abstract 1835

HILLBILLY HEROIN: STIGMA AS A POTENTIAL OBSTACLE TO ADDRESSING THE OPIOID EPIDEMIC

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Stigma may play an important role in understanding successful interventions to control the opioid epidemic in the United States. In previous research on public health, stigma has been described both as an agent of positive health behaviors and as an agent of marginalization contributing to poorer health.

Past scholarship has described instances where stigma has positively motivated public health changes, such as among tobacco users; it has also been associated with discrimination against vulnerable individuals, resulting in increasingly poorer health behaviors, for example in relation to HIV prevention messaging. Using extant research, we discuss how the discourse around stigma may obscure the difference between the denormalization of unhealthy behaviors on the one hand and wholesale rejection of individual identities on the other. More precise interventions, which focus on behavior and judiciously avoid stigmatizing individual identity, might alter the effect of public health messaging and improve outcomes.

We discuss how clinical approaches to address opioid addiction, such as targeting drug-seeking behavior, may inadvertently worsen stigma within affected communities by conflating behavior with identity. Finally, we offer a broader perspective on how public health policy makers can contribute to positive social norm change and motivate healthy behaviors by incorporating strategies which disentangle unhealthy behaviors from identity.

159) Abstract 1266

PAIN AND QUALITY OF LIFE IN PEDIATRIC PATIENTS POST-SURGERY

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Higher pain levels have previously been associated with lower health-related quality of life in older individuals with prolonged chronic pain and neuropathic patients. However, this relationship has not been investigated in children undergoing surgery. Therefore, we evaluated the pain levels of children (N = 121) post-surgery and their quality of life as reported by their parents or guardians. Children and their parents completed daily diary follow-up measures on day 1, day 3 and day 7 after surgery. Children reported their pain levels using the Faces Pain Scale and parents reported on their child's quality of life using the Pediatric Quality of Life Inventory (PedsQL). Pain on follow-up day 1 was correlated with the physical ($r(56) = -0.365$, $p = 0.006$) and emotional ($r(56) = -0.365$, $p = 0.006$) subscales of the PedsQL, but not social or school related quality of life (p's > .05). On day 3, pain levels were correlated with physical ($r(49) = -0.333$, $p = 0.019$) and school-related ($r(49) = -0.333$, $p = 0.019$) quality of life, but not emotional or social quality of life (p's > .05). Day 7 post surgery pain was significantly correlated with all four subscales (physical: $r(51) = -0.446$, $p = 0.001$; emotional: $r(51) = -0.351$, $p = 0.011$; social: $r(51) = -0.390$, $p = 0.005$; school: $r(51) = -0.390$, $p = 0.005$). On follow-up day 1, there may have been an association between pain and quality of life for only the physical and emotional measures because the children were not in school or socializing the day after surgery. In contrast, on day 3, pain levels were associated with the physical and school-related subscales possibly because the children had returned to school and faced difficulties participating because of their pain. On day 7, lingering pain would have affected all four subscales of quality of life since they had likely returned to their regular activities. Given that pain has differential effects across post-operative recovery days, future research should be done to determine factors which might increase quality of life in the presence of pain. These factors could include medication or physical therapy for physical quality of life, accommodations for school-related quality of life, and distraction or humor from family members for emotional quality of life.

160) Abstract 1738

THE IMPACT OF GENDER ON NEUROPATHIC PAIN IN JAMAICAN PATIENTS WITH SICKLE CELL DISEASE.

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Pain is a hallmark of Sickle Cell Disease (SCD), and is associated with morbidity and quality of life.Â There are three known types of pain associated with SCD: recurrent vaso-occlusive crisis (VOC), chronic pain syndrome, and neuropathic pain. Most of the existing studies on SCD-related pain are focused primarily on VOC pain, and there are few studies that have examined the occurrence and characteristics of neuropathic pain in SCD patients. There is emerging evidence that demonstrates that socio-demographic factors (age, gender, nationality/geography) influence both frequency and treatment of neuropathic pain. Additionally, the treatment for neuropathic pain is less available in developing countries (e.g. the Caribbean-Jamaica), which are places with inordinate rates of SCD. Given the prevalence of SCD in the Caribbean and paucity of neuropathic treatment in developing countries, the objective of the study was to examine gender differences in neuropathic pain experiences in SCD patients in Jamaica.Â The study examined 81 participants, 34 males and 47 females, with a mean age of 35.81 years. Participants completed the Short Form McGill Pain Questionnaire (SF-MPQ), which assesses qualitative and quantitative aspects of pain, including location, intensity, quality, and temporal dimensions. Results showed males reported more neuropathic pain ($t= (79) = 2.782$, $p <.01$). These results suggest a possible role of culture and diet in the etiology and manifestation of pain in adults with SCD where rates of persistent neuropathy may equal other SCD clinical presentations. More studies are needed to explicate the prevalence of neuropathic pain processes in patients with SCD, and to better understand how neuropathy influences and is influenced by psychosocial factors.

161) Abstract 1237

THE UTILITY OF PTSD SYMPTOMS AND PAIN CATASTROPHIZING IN PREDICTING ACUTE PAIN AMONG EMERGENCY DEPARTMENT PATIENTS INJURED IN A MOTOR VEHICLE-RELATED ACCIDENT

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Background: Posttraumatic stress disorder symptoms [PTSS] are common after injury and are consistently associated with chronic pain, and with factors that maintain pain, e.g., pain catastrophizing (PCS; helplessness, rumination, and magnification). Yet, there is a gap about how these factors operate in the acute aftermath of injury. Among emergency department (ED) patients injured in a motor vehicle-related accident (MVA), we examined whether PTSS and PCS predict pain at the point of injury in the ED throughout 3-months to inform acute prevention efforts.

Methods: This study is a secondary analysis of data from a null trial of the PTSD Coach app vs. standard care among injured ED patients. We enrolled 64 adults (37% male; *M* age = 37) injured in MVAs < 24 hours prior from the EDs of two Level 1 trauma centers. Eligible subjects reported serious injury, pain score ≥ 4, and access to mobile applications. At three timepoints (the ED; 1-and 3-months post-injury), subjects completed surveys of PTSS, PCS, and PROMIS measures of acute pain (summary score of pain right now, at its worst, and on average). Retention to date is high at 1-month (86%) and 3-months (75%).

Results: In the ED, 22% of subjects screened positive for probable PTSD; these numbers rose to 38% and 24% at 1-and 3-months post-injury, respectively. Pre-injury PTSS (measured in the ED) were moderately associated with pain (r's = 0.3 - 0.4) and PCS (r's = 0.3 - 0.6) through 3-months. Further, PCS components of magnification and rumination were consistently associated with pain through 3-months (r's = 0.2 - 0.4). Linear regression using both PTSS and PCS as predictors revealed a non-significant trend for pre-injury PTSS to predict pain in the ED ($\beta = 0.26$; $p = 0.08$). Acute PTSS (measured 1-month post-injury) was significantly associated with pain at both 1-month ($\beta= 0.36$; $p < .01$) and 3-months ($\beta= 0.56$; $p < .01$), after controlling for ED pain. PCS was not associated with pain in either model.

Conclusion: Pre-injury and acute PTSS are associated with post-injury pain; ED screening and further monitoring of PTSS among injured patients may identify those at risk for pain chronicity. Despite strong associations with PCS and chronic pain, the effect of PCS on acute pain was negligible after accounting for PTSS. Early cognitive-behavioral therapy for PTSS may serve to prevent or reduce post-injury pain.

162) Abstract 1457

PSYCHOPHYSICS OR PSYCHOSOMATIC? THE IMPACT OF PERCEIVED STRESS ON PAIN INTENSITY AND STIMULUS-EVOKED PAIN CATASTROPHIZING TO NOXIOUS AND INNOCUOUS SENSORY STIMULI

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While increasing evidence suggests that stress may play a substantial role in the etiology and sensitization of clinical pain disorders, the underlying pain mechanisms influenced by stress remain unclear. Therefore, to examine the role of stress on pain sensitivity, the present study evaluated the effect of perceived stress in healthy young adults

on self-report measures of pain intensity and pain catastrophizing during exposure to thermal cold (noxious) and neutral (innocuous) laboratory pain. Using a 2 (high vs. low stress) X 2 (pain vs. no pain) design, participants prescreened for high (n = 45) and low (n = 36) perceived stress on the Perceived Stress Scale were randomized to either a pain or no pain condition. Participants immersed their dominant hand into a cold (2°C) or neutral (35°C) water bath to induce a painful or innocuous sensation and were told to keep their hand in the water for two minutes or until reaching their pain tolerance. After termination, participants rated both their stimulus-evoked pain and catastrophizing. Although analyses revealed no difference between high and low stress on tolerance time, after controlling for gender the high stress individuals in the cold pain condition reported greater pain intensity, $F(1, 42) = 6.175$, $p = .017$, $\eta_p^2 = .128$ and pain catastrophizing to the noxious stimulus, $F(1, 42) = 12.655$, $p = .001$, $\eta_p^2 = .232$, relative to their low stress counterparts. Although the high stress participants in the neutral water condition did not report significantly greater pain intensity relative to their low stress counterparts ($p = .072$, $\eta_p^2 = .095$), they did report significantly greater pain catastrophizing, $F(1, 33) = 5.641$, $p = .024$, $\eta_p^2 = .146$ to the innocuous stimuli. The addition of pain catastrophizing as a covariate to the model eliminated the aforementioned differences in pain intensity (p's > 1.85). Together, these findings suggest that perceived stress may contribute to heightened pain intensity to both noxious and innocuous stimuli, and that pain catastrophizing appears to mediate this relationship. Therefore, pain catastrophizing may serve as a potential target of intervention for the reduction of hyperalgesia for individuals experiencing high stress.

163) Abstract 1786

STUDYING EFFECTS OF DEEP BREATHING ON PAIN: SHOULD WE AVOID A LARGE DEAD SPACE IN OUR EXPERIMENTAL SET-UP?

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Background:Stimulation of the baroreceptors by slow deep breathing (SDB) has been hypothesized to mediate inhibitory effects of SDB on pain. To measure respiratory volume accurately using a pneumotachograph, participants typically wear a face mask, which creates a dead space and discomfort. In case of increased arousal such as psychological or chemosensory stress, baroreceptor activity can be suppressed and consequently no pain analgesic effect will occur.

Objectives:To investigate the effect of SDB on self-reported pain, baroreceptor sensitivity (BRS) and heart rate variability (HRV) compared to normal paced breathing (NPB) and to what extent an artificial dead space moderates these effects.

Methods:Thirty healthy female participants were instructed to breathe at a frequency of 0.1 Hz (SDB) and 0.2 Hz (NPB). The experiment consisted of 3 blocks in which participants performed SDB and NPB. The first block was always without pain induction and without respiratory face mask. Depending on the randomization, participants breathed through a respiratory face mask mounted on a pneumotachograph during block 2 or 3. Participants received thermal pain in blocks 2 and 3 and rated the intensity of each stimulus. Blood pressure, R-R interval and tidal volume were measured continuously throughout the entire experiment whereas end-tidal CO2 (ETCO2) was only measured during conditions where the respiratory face mask was attached.

Results:SDB significantly increased BRS and HRV compared to NPB. Although BRS and HRV remained significantly increased during SDB combined with pain induction, there was no main effect of breathing condition on pain. However, pain significantly changed with stimulus repetition, which was more pronounced during SDB + face mask (interaction effect). Post hoc contrasts demonstrated that self-reported pain significantly decreased for only the first four thermal stimuli. Finally, results demonstrated that the large effect of breathing condition on HRV diminishes if the respiratory face mask is attached (interaction effect).

Conclusion: SDB did not affect self-reported pain despite a significant increase of BRS and HRV. Nevertheless, the additional dead space seem to affect the interaction between SDB, HRV and pain over time. Other potential mechanisms such relaxation and expectation should be considered in how SDB can modulate pain.

164) Abstract 1153

OPEN-LABEL PLACEBOS FOR ELDERLY PATIENTS WITH CHRONIC KNEE PAIN: EFFECTS ON PAIN, FUNCTIONALITY, AND QUALITY OF LIFE

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Recent randomized controlled trials indicate that open-label placebos (OLP) can have real therapeutic effects across various medical conditions, including irritable bowel syndrome, depression, and chronic low back pain. The aim of this study was to examine the effects of OLP on pain, functionality and quality of life in patients with painful osteoarthritis of the knee in a German population. Sixty patients (mean age: 66.9 ± 9.7 (SD), 55% female) were randomly assigned to either an untreated control group (n = 19) or one of two OLP groups. Patients in the placebo groups received placebos twice daily for three weeks, along with the information that placebo intake would improve either pain (n = 21) or mood (n = 20). All patients completed questionnaires at baseline and after 21 days to assess pain, function and stiffness (WOMAC), quality of life (SF-12), anxiety (STAI), and self-efficacy (SWE). A diary was kept to assess pain (at start, rest, and load) and mood on NRS for 21 days. Saliva probes to evaluate diurnal cortisol profiles were collected on days 0 and 21. Since no differential effects between the two placebo groups were observed, they were merged for further analysis. From week 1 to 3, mean values of pain at rest decreased significantly in the OLP group compared to controls (mean difference (MD), -0.7 ± 0.3 SE; $F_{(1,55)}$=4.5, p=0.038) and significant interactions with sex were observed for pain at start ($F_{(1,55)}$=4.1, p=0.048) and WOMAC-pain ($F_{(1,56)}$=4.7, p=0.035). Post hoc tests indicated that only women showed significant placebo effects on pain at start (MD -1.3 ± 0.5, $F_{(1,31)}$=6.3, p=0.018) and WOMAC-pain (MD -8.2 ± 2.5, $F_{(1,31)}$=5.4, p=0.027). Pain at load, function, stiffness, quality of life, anxiety, mood, and diurnal cortisol levels did not change differentially between groups in any sex. Interestingly, self-efficacy increased significantly only in controls (MD 2.3 ± 0.7, $F_{(1,57)}$=9.2, p=0.004). In conclusion, analgesic placebo effects were observed regardless of whether the OLP intervention targeted mood or pain. Furthermore, women profited more than men, and the analgesic effects of OLP could not be explained by stress reduction. Results indicate that elderly patients with chronic knee pain may benefit from the regular intake of OLP by triggering nonconscious mechanisms that improve chronic knee pain.

165) Abstract 1257

CHILDREN'S AGE AND PARENTAL BEHAVIORAL RESPONSE IN THE POST ANESTHESIA CARE UNIT

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Children who undergo surgery often experience pain as a result. Looking at how adult behavior influences children's

postoperative pain is an important element for understanding how to help children learn to cope with pain from surgery. Research suggests parents' use of reassurance (e.g., "don't worry" or "it's going to be okay") and/or empathy (e.g., "I know it's hard") to comfort their child when in pain may actually increase a child's pain. This is because these strategies direct a child to focus on his or her feelings of pain without providing a way to alleviate pain. One important question is with which children are parents most likely to use these behaviors. Therefore, this study investigated the association between parents use undesired behaviors such as empathy and reassurance and child age. Nurses (N = 23) and parents (N = 72) were recorded in the post anesthesia care unit (PACU) and their behaviors were coded for empathy and reassurance. The age of children was also collected. Children were on average 6.19 years old (*SD* = 2.77). Results indicate that parents are more likely to use reassurance (r = -.403, p = .002) and empathy (r = -.271, p =.039) with younger children as compared to older children. Additionally, it appears parents were more likely to use empathy with reassurance (r = .298, p = .021). This suggests parents typically use the undesired behaviors of empathy and reassurance together. These findings also indicate that parents of younger children should even more so be the target of parent behavior interventions to limit the use of these behaviors. This would aid in making adult behavior interventions more effective in minimizing children's pain because this is the age group most affected by undesired parental behaviors. Better understanding how adults respond to children's pain and how to modify this behavior could be what helps minimize children's postoperative pain.

166) Abstract 1323

SHARING PAIN: AN ELECTROPHYSIOLOGICAL STUDY ON THE EXPECTATION OF PAINFUL STIMULATION ON OTHERS.

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Background: Pain is a complex experience that involves different factors. In particular, the context in which a painful stimulation is delivered is crucial. The aim of the present study is to investigate how physical, temporal and psychological cues modulate pain perception using contingent negative variation (CNV), a well-known evoked potential related to the expectation of an incoming event.

In our study, physical context is represented simply by the difference between high intensity and low intensity electrical stimuli delivered to participants. Social context is represented by the fact that participants not only received the stimulation but also observed another participant receiving it. Finally, temporal context is represented by the order in which participants received or observed the painful stimulation.

Methods: Pain was induced by electrical stimuli: participants had to stop them as soon as possible and reaction time (RT) and pain rating (NRS form 0 to 10) were measured. Two participants were engaged in the study at the same time (social context): when a participant was tested with the electrical stimuli (T session), the other observed the experimental procedure (O session), thus two groups have been designed: a group of participants who first received the stimuli and then observed the procedure and a group of participants who first observed the procedure and then received the stimuli. In the T session participants were presented a red or green cue, followed by the train of respectively painful and non painful electrical stimuli, and thus expected less pain after the green and more pain after the red cues (physical context). After 2 blocks of electrical stimuli participants inverted their role (temporal context).

Results: We found an increase in CNV mean amplitude and a decrease in RTs when electrical stimuli followed the red light not only in participants who received the stimuli but also in participants who just observed the procedure. Moreover participants who first observed the procedure presented an increase of CNV mean amplitude and a positive correlation between their NRS and their empathy scores.

Conclusions: These data show that both physical and temporal aspects of the context, as well as psychological traits, modulate the experience of pain at the behavioral and electrophysiological levels.

167) Abstract 1819

HOW THE IMPACT OF CHRONIC PAIN ON MENTAL HEALTH VARIES BY AGE AND INTERFERENCE WITH LIFE

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While prior research has found significant associations between mental health and pain, there is little research on the impact of chronic pain on mental health, especially how this impact varies by the characteristics of pain and its sufferers. This study investigates whether severe chronic pain affects mental health (depression, anxiety, and life satisfaction) over time, contingent on age and the extent to which pain interferes in the sufferer's life. The data are drawn from Midlife in the US (MIDUS), a survey of a nationally representative sample of US adults. The analytic sample consists of three groups: (1) 135 individuals who reported severe chronic pain that substantially interfered with their lives (88 women, 47 men), (2) 238 individuals who reported severe chronic pain without notable interference in their lives (133 women, 105 men), and (3) 663 individuals who did not experience severe chronic pain (250 women, 313 men) [mean age=55]. The time lag between chronic pain and mental health assessment was 28 months on average. The findings showed that women who suffered from severe chronic pain that interfered substantially in their life had higher levels of depression and anxiety over time than women who did not experience this type of pain. In addition, younger women with severe chronic pain that interfered substantially with their life reported significantly lower life satisfaction than their older counterparts with similar pain. Men with severe chronic pain that interfered substantially with their life reported a higher level of anxiety over time than their peers who did not experience this type of pain. For both women and men, those who had severe chronic pain but did not experience notable interference in their life had mental health outcomes comparable with those of individuals who did not experience chronic pain. The results indicate the need for practitioners to pay attention to an increased risk of mental health problems among individuals who suffer from severe chronic pain that substantially interferes with their lives, particularly younger women.

Key words: Chronic pain, mental health, depression, anxiety, life satisfaction, age, interference with life

168) Abstract 1619

DIFFERENCES IN REPORTED PAIN RELATIVE TO ADHD SYMPTOMOLOGY IN YOUNG ADULTS

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Adults with ADHD report chronic pain at higher rates than the general population. Indeed, up to 80% of adults with ADHD report chronic pain compared to 30-40% of the general population. However, this disparity has received little attention in research.To date, one study has found that ADHD in adults is associated with lower cold pain thresholds and tolerances in a cold water immersion (Treister et al., 2015). However, no study has examined the relationship between ADHD and pain responses to experimentally-induced pain across multiple stimuli. The present study sought to examine the relationship between ADHD symptoms and pain intensity ratings across three different noxious stimuli. Participants (N = 99, 60.6% female) completed a battery of questionnaires, including the Adult ADHD Self-Report Scale and the Pain Catastrophizing Scale (PCS). They then provided continuous pain ratings, using a 0 ("no pain") to 100 ("worst pain imaginable") scale, during 30 seconds of repeated pinprick, up to 2 minutes of cold water immersion, and up to 5 minutes of ischemic tourniquet. Pain stimulus order was counterbalanced across participants. Linear mixed effects models examined the relationship

between dimensional report of ADHD symptoms and changes in pain over time. Addition of ADHD symptoms to a model containing Time, Stimulus, and PCS significantly improved model fit (ΔAIC/BIC > 10). There was a significant interaction between ADHD symptoms and time, $F(1, 41242) = 98.64$, $p<0.001$. At higher levels of ADHD symptoms, individuals reported greater increases in pain over time across all stimuli, b = 0.002, $p<0.001$. Analyses conducted using a categorical ADHD variable based on evidence-based clinical cut-offs returned similar results. This study suggests that at increasing symptoms of ADHD or at binary clinical cutoff for ADHD an association emerges with the sensory adaptation to acute pain. Importantly, this is the first study to examine the relationship between pain ratings and ADHD symptoms as a continuous variable, which is notable as ADHD symptoms are often cross-cutting diagnostic features. These findings have implications for understanding and managing pain in individuals with ADHD as well as understanding the role of attention/inattention in the experience of pain.

169) Abstract 1622

TRANSCRANIAL DIRECT CURRENT STIMULATION OF THE PREFRONTAL CORTEX DOES NOT IMPACT RATINGS OF VALENCE AND AROUSAL AFTER EMOTIONAL IMAGE VIEWING

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Transcranial direct current stimulation (tDCS) is a form of noninvasive brain stimulation that can either enhance (via anodal stimulation) or depress (via cathodal stimulation) neural excitability in focal areas of the cortex through application of a low-intensity direct current. To date, two studies have found that individuals rate images as less unpleasant after anodal tDCS of the left dorsolateral prefrontal cortex. The present study sought to replicate previous findings regarding the impact of tDCS on judgments of image valence and examine the effects of tDCS on ratings of emotional arousal after image viewing. Thirty-two healthy participants (15 female) completed three sessions of an image viewing procedure, each separated by at least one week. Following a double-blind protocol, on each testing day participants received 15 minutes of either anodal, cathodal, or sham tDCS over the left dorsolateral prefrontal cortex (order counterbalanced across participants). Active stimulation was delivered at 2mA. tDCS was immediately followed by viewing of 24 images from the International Affective Picture System (8 erotic, 8 neutral, 8 mutilation). Following each image, participants provided ratings of valence (1, *unpleasant* to 9, *pleasant*) and arousal (1, *calm* to 9, *excited*) using the Self-Assessment Manikin. Mixed linear modeling was used to analyze tDCS effects on valence and arousal ratings while controlling for counterbalancing order and within-session habituation. Results indicated that tDCS was unrelated to ratings of emotional valence, $F(2, 2273) = 0.62$, $p = 0.54$, and emotional arousal, $F(2, 2273) = 0.06$, $p = 0.94$. Moreover, examination of the interaction of tDCS and image content indicated that effects of tDCS did not vary by type of image viewed, both p's > 0.1. The present study failed to replicate previous findings regarding the impact of tDCS on ratings of emotional valence after image viewing and did not support an impact of tDCS on emotional arousal. Further research is needed to confirm these null findings or to determine the circumstances under which tDCS impacts emotional valence and arousal associated with image viewing.

170) Abstract 1546

ASSOCIATIONS BETWEEN DIURNAL CORTISOL PROFILES AND P3 AMPLITUDE DURING A WORKING MEMORY UPDATING TASK

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Objective: One of the key cognitive functions for coping with everyday tasks is working memory updating (WMU). It refers to the ability to maintain information which is changing over time, in working memory. WMU is vulnerable to chronic stress and it has been shown by means of event-related potentials (ERPs) that the P3 amplitude during a WMU task is altered in patients suffering from post-traumatic stress disorder. In this study, we investigated whether neural activity during WMU is associated with basal activity of the hypothalamic-pituitary-adrenal (HPA) axis in healthy adults.

Methods: Forty-five healthy, German-speaking adults participated (mean age: 24.3 ± 3.3 years; eight male; BMI = 24.2 ± 3.1 kg/m^2). WMU was assessed by means of an n-back task with three conditions (1-back, 2-back, and 3-back). Parietal P3 amplitude was used as measure for neural processing during WMU. Basal HPA axis activity was assessed by means of diurnal salivary cortisol profiles at eight time points on a non-active day. Area under the curve with respect to ground (AUC_g) was used as measure for total diurnal cortisol output.

Results: WMU performance was lowest in the 3-back condition ($p < .001, \eta_p^2 = .77$) and was independent of cortisol levels. P3 amplitude was lowest in the 3-back condition as well ($p < .001$, $\eta_{p2} = .73$) and was higher in the target-present than in the target-absent trials ($p < .001$, $\eta_p^2 = .29$). For the target-absent trials, P3 amplitude in the 3-back condition was related with basal cortisol levels ($r = .29$, $p = .043$), leading to a lower difference between the target-present and the target-absent trials for the participants with higher cortisol AUC_gs, corresponding to an ERP pattern that is associated with higher task demands.

Conclusions: Our findings show that already slight increases in HPA axis activity in healthy people can be associated with altered neural processing during a WMU task. This has implications for everyday life. ERPs seems to be a good means for detecting HPA axis activity-related changes in cognitive processing, independent of behavioral task performance. In future research, associations between basal HPA axis activity and ERP measures for other cognitive domains should be investigated for healthy and for chronically stressed people.

171) Abstract 1469

NEURAL UNDERPINNNINGS OF AN EFFECT OF INTEROCEPTIVE TRAINING ON DECISION MAKING PROCESSING

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Interoception is perception of afferent information that arises from anywhere and everywhere within the body (Cameron 2001). Individual differences in interoceptive awareness were associated with not only affective processing, but also decision making processing (Critchley 2013). Somatic marker hypothesis have pointed out the effects of interoception on decision making processes, which is impaired by ventromedial prefrontal cortex (vmPFC) lesion (Damasio 1999). Consist with the theory, individuals with interoceptive dysfunction were likely to have disadvantageous decision making (Werner 2009). Recently, interoceptive awareness could be enhanced by biofeedback technique. Garfinkle, et al. developed an interoceptive training task modified from heartbeat perception task, which enhanced interoceptive accuracy and reduced anxiety symptoms (Garfinkle 2017, APS poster). Kobayashi, et al. revealed that biofeedback technique using skin conductance response (SCR) improved interoceptive awareness, which leaded to appropriate decision making (Kobayashi 2012, APS poster). Although the relationship between interoception and decision making seemed reliable, its neural underpinnings were still unclear. Given that anterior insula (AI) cortex is one of key node of interoception, we hypothesized that functional connectivity between vmPFC and AI were involved in an effect of interoception on decision making processing. To address this issue, we conducted a longitudinal intervention study using the interoceptive training (Garfinkle 2017), and obtained resting state fMRI before and after the intervention. Also, we evaluated interoceptive accuracy and decision making processing by using a heartbeat perception task (Schandry 1981) and emotional decision making tasks (Kirby 1999, Takahashi 2010, 2013), respectively. Now, we acquired data from 2

healthy subjects. We plan to obtain and analyze data from 15 healthy subjects before our presentation in APS 2019. The study protocol was approved by the ethical committee of NCNP. Informed consent was obtained from each subject. The expected results are following. After the intervention, interoceptive accuracy would be enhanced, and emotional decision making processing would shift to appropriate ways compared with baseline periods. In line with these behavioral changes, functional connectivity between vmPFC and AI would be enhanced.

172) Abstract 1218

THE EFFECTS OF CELLULAR ENERGETICS ON COGNITIVE ABILITIES

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Several theories suggest that mitochondria influence cognitive processes. Dysfunctional mitochondria are associated with poorer cognitive performance, though these findings are largely based on animal models. Other studies have identified cognitive deficits among individuals diagnosed with a mitochondrial disorder; however, cellular energetics were not directly measured. In this study, we aimed to test theories of cell energetics and cognitive performance in humans for the first time by directly measuring mitochondrial and glycolytic functioning at the cellular level. Participants (n = 20) completed cognitive tests (i.e., Delis-Kaplan Executive Functioning System Color-Word Interference Test, Wechsler Adult Intelligence Scale-Fourth Edition Digit Span subtest, and Wisconsin Card Sorting Test) measuring three dimensions of executive functioning: inhibition, working memory, and cognitive flexibility. Mitochondrial and glycolytic functioning was measured simultaneously with the Seahorse extracellular (XF) analyzer using peripheral blood mononucleated cells (PBMCs) isolated from blood samples. Results indicated a positive association between glycolytic reserve (i.e., measurement of the cell's ability to produce energy when mitochondria are dysfunctional) and inhibition, r = .37. There was also a small correlation between glycolytic reserve and cognitive flexibility, r = .21. In opposition to available theories, mitochondrial spare capacity (i.e., the difference between basal and maximum oxygen consumption of mitochondria to produce energy) was not significantly associated with any of the indicators of cognitive performance. We anticipate a sample size of 70 by March, 2019. Accordingly, we will have greater than 80% power to detect significant associations at the time of the presentation. Our findings suggest that the energy demands of performing higher order cognitive tasks may exceed mitochondrial capacity, although further research is clearly needed to test this possibility. Further research in cell energetics could contribute to a better understanding of how cognitive deficits emerge among those with cardiometabolic conditions that are thought to be related to mitochondrial dysfunction.

173) Abstract 1675

NEUROMODULATION AS A TREATMENT FOR CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY (CIPN): EXAMINING DIFFERENCES BETWEEN PLACEBO AND NEUROFEEDBACK

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Background: CIPN is a common side effect of chemotherapy, leading to impairment in daily activities and diminished quality of life. Neurofeedback (NF) is a brain-training paradigm that induces neuroplasticity to modulate brain activity and has been shown to improve CIPN. We compared the effects of NF, placebo feedback (PL), and waitlist (WL) on CIPN symptoms. **Methods:** Ninety-one (90 female; mean age=60; average length of symptoms=35.5 mos) breast cancer survivors ≥3 months from completing chemotherapy who reported ≥3 on the NCI's neuropathy rating scale, were randomized to a NF group (25) and underwent 20 sessions of EEG NF, a PL group and underwent 20 sessions of sham feedback (27), or a wait-list control group (24). We used quantitative electroencephalography (qEEG) neural imaging to identify EEG patterns unique to CIPN and then provided NF to change aberrant brain signatures. Measures including the Pain Quality Assessment Scale (PQAS), the Brief Pain Inventory (BPI), the Brief Symptom Inventory (BSI), the MD Anderson Symptom Inventory (MDASI), and the Short-Form 36 Health Survey (SF-36) were completed and EEG collected at baseline, after 10 weeks, and one month later. EEG analysis was done using qEEG and Low Intensity Electromagnetic Tomography (LORETA) imaging. **Results:** Baseline qEEG patterns of participants showed elevated beta frequencies (13-21 Hz) in and decreased alpha (8-12 Hz) in parietal lobe sites compared to a normal population. NF and PL showed distinct changes in brainwave activity and with greater improvement in the NF group. NF participants' CIPN ratings were lower than both PL and WL groups on 17 out of 19 PQAS rating scales and NF had a greater effect size than PL in 16 out of the 19 PQAS scales. Post EEG analyses of the NF group showed increased alpha and decreased beta power (alpha/beta power ratio) at the treatment sites (Brodmann area 7), where protocols were based on increasing alpha and decreasing beta. The PL group showed an increase in alpha along the sensory motor area, but not at the area of treatment. **Conclusion:** Effect sizes of NF and outcome measures were greater than PL, and there were distinct brain patterns of NF and PL that were associated with outcomes. NF affected change at the area of treatment according to treatment protocols, while PL increased alpha in areas associated with placebo.

174) Abstract 1746

PRO-INFLAMMATORY CORRELATES OF NEURAL RESPONSES TO AFFECTIVE STIMULI

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To date, several studies have explored how reactivity to affective stimuli is related to increases in peripheral inflammation ("brain-to-body"). Some propose that overtime these increases in peripheral inflammation can directly alter neural circuitries underlying threat, reward, and executive control via a neuroimmune network. Less work has explored this reverse "body-to-brain" direction where information from the periphery can shape neural activity to emotional information. Further, no known studies have examined how inflammation at one time point can prospectively predict neural responses to affective information at a later time. To fill this gap in our knowledge, the present project examines how levels of peripheral inflammation influence neural responses to affective stimuli in a sample of midlife adults. Specifically, data from the publicly-available Midlife in the United States (MIDUS) dataset will be utilized to examine whether levels of peripheral inflammation (i.e., IL-6 and CRP) are associated with neural reactivity to affective images at a later time-point. Seventy-two individuals between 25 to 74 years provided biomarker samples (including IL-6 and CRP) and then completed a neuroimaging session months to years later. During the fMRI portion of the study, participants viewed and rated images (positive, negative, and neutral). Recent work suggests that the anterior insula and its connectivity to other regions in the cortex and limbic areas plays a critical role in integrating information from the periphery together with information from the environment to produce emotional responses. Thus, fMRI analyses will examine the association between inflammation and anterior insula reactivity to the affective stimuli, as well as the association between inflammation and anterior insula connectivity to regions in the default mode and salience networks utilizing

psychophysiological interaction (PPI) analysis. This approach will yield insights into neuroimmune processes whereby information from the body (i.e., inflammation) can lead to differences in neural responses to environmental cues (i.e., affective images). Results have potentially important implications for understanding the "body-to-brain" pathways that may play a role in the pathophysiology of physical and mental illnesses.

175) Abstract 1440

VAGAL-NEUROIMMUNOMODULATION AND ALL-CAUSE MORTALITY: REFINING A BIOMARKER OF SURVIVAL IN THE MIDUS COHORT STUDY

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Background: Vagally mediated immunomodulatory effects play an important role in controlling proinflammatory cytokine production and inflammation. This cholinergic anti-inflammatory pathway is organized as a reflex arc and gained increasing interest as therapeutically target in clinical research. An index of vagal neuroimmunomodulation (NIM) is reported to be related to reduced tumor growth rate and longer survival time in a sample of 272 patients suffering from fatal cancer. Given the pivotal role of this reflex arc in health and diseases we hypothesis that NIM predicts all-cause mortality in a general population sample.

Methods: Publicly available MIDUS 2 biomarker project (P4) data were matched with survival information (defined as time from baseline to death or end of follow-up) from MIDUS 3 (Median follow-up=8.6 years; downloaded from ICPSR). Two NIM-indices were calculated using the weighted average of the root mean square of successive differences between adjacent R-R intervals (RMSSD) from two 5-minute resting baseline ECG recordings divided by CRP (NIM-CRP) or IL-6 (NIM-IL6). Three ratio variants (median-split matching previously published results; quartile-split; continuously log-transformed) were entered into Cox proportional hazards models adjusted for baseline age, sex and body mass index. Proportional hazard assumptions were tested using Schoenfeld residuals.

Results: A total of 61 deaths from N=1,137 included participants were recorded, with the last exit observed 11.3 years post inclusion. All three NIM-CRP-variants showed the expected negative association with mortality but did not reach statistical significance. NIMi-IL6 showed also the expected negative association with the highest quartile being 61% less likely to experience death during the observed period compared to the lowest quartile (HR=0.39 CI 0.16-0.98;p =.046). The continuous log(NIM-IL6) was also significantly associated (HR=0.64 CI 0.49-0.83;p=.001).

Discussion: This study examined the relationship between a recently proposed biomarker of vagal NIM and survival in a general population sample. The overall risk of death was negatively associated to NIM-IL6 but not NIM-CRP as seen in Gidron et al. (2018) cancer samples. IL-6 represents a more proximate downstream measure of the reflex arc (compared to CRP) and might be more suitable for NIM calculations in general populations.

176) Abstract 1559

IMMUNE SYSTEM INFLAMMATION AND DAILY REPORTS OF LONELINESS

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Background: Previous research indicates an association between loneliness and immune system inflammatory responses to stress. Specifically, lonelier individuals exhibited greater synthesis of inflammatory cytokines by lipopolysaccharide (LPS) stimulated peripheral blood mononuclear cells compared to less lonely individuals. It is unknown whether levels of immune system inflammation may prospectively affect experiences of loneliness. **Aim:** To investigate whether levels of immune system inflammation will associate with subsequent reports of loneliness in daily life. **Methods:** 94 undergraduate students (age range 18-30) provided a dried bloodspot sample at baseline for measurement of C-Reactive Protein (CRP). Next, they completed a 48-hour daily life monitoring period. At multiple times across the 48 hours, participants completed surveys on their phones measuring loneliness, positive affect and negative affect. **Results**: In a linear regression, controlling for age, gender, positive affect, negative affect, and Body Mass Index (BMI), CRP levels at baseline associated with self-reported loneliness over the subsequent 48 hours (β= .47, t (89)=5.24, p< .001). **Conclusions:** These results add to an existing literature indicating associations between markers of immune system inflammation and psychosocial factors. Further, they provide initial evidence that immune system inflammation may affect subsequent experiences of loneliness. Future research is needed to better understand the relationship between inflammation, daily social interactions, and perceptions of loneliness.

177) Abstract 1679

INFLAMMATION, SLEEP DISTURBANCE, AND IMPAIRED REWARD RESPONSIVENESS IN HEALTHY YOUNG WOMEN

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Background: Dysregulation in reward processing is an established feature of depression and other psychiatric conditions. The psychobiological processes that underlie reward dysregulation are unclear, but sleep disturbance and inflammation may play a central role. Sleep disturbance is associated with neural and behavioral alterations in reward and is a known risk factor for depression. Inflammation can disrupt reward processing and is also implicated in depression pathophysiology. However, it has not been determined if the "two hits" of sleep disturbance and elevated inflammation increase vulnerability to reward dysregulation. Thus, the current study tested whether non-clinical sleep disturbance was associated with impaired reward learning in a sample of young women, and whether elevated levels of peripheral inflammation augmented this relationship.

Method: Healthy female participants (n = 47, age 18-25) completed the Probabilistic Reward Task (Pizzagalli, Jahn, O'Shea, 2005) for assessment of reward responsiveness, reported on sleep disturbance over the past 7-days with the 8-item PROMIS Sleep Disturbance Short Form, and provided a blood sample for assessment of the pro-inflammatory cytokine interleukin-6 (IL-6).

Results: On average, participants reported low levels of sleep disturbance (M = 16.81, SD = 6.84) and had low levels of IL-6 (M = 1.27pg/L, SD = .88). Consistent with hypotheses, higher sleep disturbance was associated with lower reward responsiveness for participants with higher, but not lower levels of IL-6 (b = -.010, SE = .005, β = -.68, p = .048), controlling for age, BMI, and ethnicity. Neither sleep disturbance nor inflammation alone were associated with reward responsiveness (p's > .8).

Conclusion: The "two-hits" of sleep disturbance and inflammation were associated with impaired reward responsiveness in a non-clinical sample. While cross-sectional, these results support further testing of sleep disturbance and inflammation as synergistic mechanisms underlying reward dysregulation.

178) Abstract 1768

INTERLEUKIN-6 AND PLACENTAL CORTICOTROPIN-RELEASING HORMONE: THE ROLES OF SOCIAL SUPPORT AND SOCIOCULTURAL CONTEXT

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The immune system and hypothalamic-pituitary-adrenal (HPA) axis, a central stress response system, are intricately linked, and during pregnancy both undergo significant changes. In healthy pregnancies, levels of both interleukin-6 (IL-6) and placental corticotropin-releasing hormone (pCRH) increase. While this is normative, some studies have implicated elevated levels of IL-6 and pCRH in negative maternal and infant health outcomes (e.g., postpartum depression, preterm birth). Some studies suggest that psychosocial factors play a role in these changes. In particular, social support has been linked to changes in levels of IL-6, however the exact nature of this association is unclear. One possible explanation might be that sociocultural context (e.g., ethnicity, socioeconomic status) plays a role in the perception of social support, and this is a factor that often goes unexplored. This study examined the relationship between IL-6 and pCRH and whether this relationship was moderated by social support. Furthermore, we examined whether this relationship is contingent upon ethnicity, in this study, Latinas compared to non-Latina White women. To test this, a moderated moderation (3-way moderation) was tested by calculating bias-corrected 95% CIs using bootstrapping with 1000 resamples via the PROCESS procedure on SPSS. Results show that this model is significant [$F(7, 35) = 9.96, p<.001, R^2= .67$], with levels of IL-6 predicting levels of pCRH when moderated by perceived social support [$b= 54.40, t(35)= -2.47, p= .02$]. This relationship is conditional upon ethnicity [$b= 237.66, t(35)= 5.26, p< .001$]. Specifically, higher levels of IL-6 predict higher levels of pCRH at low levels of social support in non-Latina White women. Additionally, the reverse association is seen at high levels of social support, such that higher levels of IL-6 predict lower levels of pCRH in non-Latina White women. These patterns do not hold for Latina women. Results suggest that the perception of social support depends on sociocultural context, and that this has implications for how physiological changes are expressed. Future studies should examine how these processes are linked to maternal and infant health outcomes.

179) Abstract 1640

PARENT AND CHILD PERCEIVED STRESS AND ANTIBODY PRODUCTION FOLLOWING VACCINATION

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Numerous studies have linked chronic stress to dampened response to vaccination in adults (e.g., Pederson et al., 2009). To date, however, these studies have been lacking in pediatric populations. Further, no studies have examined how *both* parents' and children's stress exposures might influence children's antibody production following vaccination.

Children (n = 72, M_{age} = 14.5yrs, 44.4% male) were recruited to participate in a laboratory-based study with their parents during the 2017-2018 flu season. Parents and children separately reported about their perceived stress using the Perceived Stress Scale (Cohen, 1994). Children provided blood samples via antecubital venipuncture prior to vaccination, and were subsequently vaccinated using the quadrivalent FluZone (Sanofi Pasteur). Three weeks after vaccination, children again provided blood samples to measure antibody production. We examined hemagglutination inhibition antibody titers, pre- and post-immunization, for the four strains in the vaccine as well as 19 historical strains, which allowed us to look at cross-reactive boosting effects for related strains that were not included in the vaccine. The assay protocol was adapted from the Centers for Disease Control and Prevention influenza surveillance manual.

We conducted a series of regression analyses to explore the links between parent and child perceived stress and antibody production, examining responses to each of the four strains in the vaccine as well as four composites of historical strains, separated by virus strain family (e.g., H1N1, H3N2). After controlling for demographic variables and baseline antibody titers, we found that parent-reported stress approached significance in predicting the current H3N2 strain in the vaccine (b = -.18, p < .09) as well as a composite of historical H3N2 strains (b = -.18, p < .08). Child-reported stress was marginally associated with a composite of prior H1N1 strains (b = -.22, p < .07) but was unrelated to antibody production for the H1N1 strain in the vaccine. Parent-perceived stress was marginally significant in predicting B/Yamagata in the current vaccine only (b = -.23, p = .06). These findings support the notion that stressful experiences may dampen children's response to vaccination. Data collection for the 2018-2019 season is ongoing and will expand on these findings.

180) Abstract 1130

'I CANNOT ESCAPE THE COLOR OF MY SKIN': THE HEALTH EFFECTS OF DISCRIMINATION ON STRESS, ANGER, AND DEPRESSION

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Background: Previous studies have shown that ethnic/racial discrimination can have pervasive effects on a person's health. Overt discrimination is less common today, but implicit bias and discrimination still permeate society. Previous research has shown that people of color experience higher levels of ethnic/racial discrimination. However, an empirical question remains as to whether these experiences are common in a wealthy, academic environment in the modern day. This study tested the hypotheses that students of color would endorse experiencing more perceived discrimination, stress, anger, and depression.

Method: Sixty-three undergraduate students were recruited from a diverse, private, Northeastern Catholic university and were asked to complete an online survey assessing their lifetime experiences of ethnic discrimination, perceived stress, anger, and depressive symptoms.

Results: Independent sample t-tests indicated that there was a significant difference between levels of ethnic/racial discrimination, stress, and depressive symptoms among students of color experiences compared to their White peers (p's < .001). Analyses failed to show a significant difference between students of color and White student's levels of anger. Exploratory regression analyses revealed that depressive symptoms were most significantly predicted by stress. However, stress was significantly predicted by experiences of discrimination. These results suggest higher levels of stress mediate the relationship between higher levels of discrimination and depression in this population. Anger symptoms were also significantly predicted by stress, but not by race or experiences of discrimination, and thus not used in a test of mediation.

Conclusion: Our results support previous findings that people of color are at risk for negative health outcomes because of higher exposure to ethnic/racial discrimination, stress, and depressive symptoms. These results provide insight into the persistence of the relationship between discrimination and health within a diverse, higher SES environment and can inform future research into possible protective factors.

Keywords: perceived discrimination, stress, anger, depression, health

181) Abstract 1635

DAILY ASSESSMENTS OF PERCEIVED DISCRIMINATION AND DISPARITIES IN CARDIOVASCULAR DISEASE RISK: IS INFLAMMATION A BIOLOGICAL PATHWAY?

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Rationale: There are stark racial disparities in cardiovascular disease (CVD), with African Americans at higher risk than Whites. Although multiple factors contribute to these disparities, recent evidence suggests a role for differential exposure to race-related stressors, such as discrimination. Here, higher levels of discrimination may confer increased risk for CVD, but the biological pathways by which discrimination influences CVD are not fully understood. Inflammation may be one such pathway, given that 1) inflammatory processes contribute to the pathophysiology of CVD, 2) elevated systemic inflammation predicts increased risk for CVD, and 3) systemic inflammation is positively associated with exposure to psychosocial stressors. Thus, the goal of the present study is to explore relationships between perceived discrimination, systemic inflammation, and CVD risk disparities to examine the possible mediating role of inflammation. Specifically, this ongoing study captures repeated or transient experiences of discrimination using daily assessments of discrimination exposure to test for their associations with systemic inflammation and arterial stiffness, a preclinical marker of CVD risk.

Methods: Participants will be 112 African American and White adults recruited from the Pittsburgh community. As a part of the study, participants complete an initial questionnaire battery, a 14-day electronic daily diary protocol to measure daily discrimination, and a laboratory visit (Figure 1). The initial questionnaire battery includes demographics, global measures of discrimination, and assessments of potential covariates. The daily diaries use a modified version of the Everyday Discrimination Scale and also assess daily distress and affect. At the laboratory visit, participants undergo 1) a blood sample to assess the inflammatory markers interleukin (IL)-6 and C-reactive protein (CRP), 2) a psychophysiological assessment to measure pulse wave velocity, a preclinical measure of arterial stiffness, and 3) anthropometric measures.

Hypotheses:

1. More frequent daily reports of perceived discrimination will be associated with higher systemic inflammation and greater arterial stiffness.
2. Race differences in arterial stiffness will be partially mediated by daily reports of perceived discrimination through heightened systemic inflammation.

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182) Abstract 1205

CORTISOL RESPONSES TO A LABORATORY STRESSOR: EXAMINING THE ROLE OF ETHNIC MICROAGGRESSIONS

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Although research has documented the impact of ethnic microaggressions (i.e., subtle forms of discrimination) on perceived stress levels, their relation to biological markers of stress, such as cortisol, is less understood. Similarly, the role of sensitivity to microaggressions (i.e., how microaggressions make a person feel) in the association between microaggressions and stress has also been understudied. Therefore, the current study examined whether salivary cortisol responses to a laboratory stressor (Trier Social Stress Test; TSST) differed among an ethnically diverse sample of college students (*N*=109, *M*age 18.7, *SD*=1.3 years, 74% female, 44% Latino) based on whether they experienced microaggressions frequently (*n*=29) or infrequently (*n*=74). Additionally, we examined how cortisol reactivity differed between those who were highly sensitive to experiences of microaggressions (*n*=56; i.e., were bothered by them) compared to those who were not as sensitive to them (*n*=46; i.e., were not upset by those experiences). Participants were exposed to the TSST and their salivary cortisol was collected before and after the stressor to assess their cortisol reactivity. Experiences of microaggressions were assessed using the Everyday Microaggressions Scale. Results of repeated measures ANOVAs controlling for gender revealed that students who experienced ethnic microaggressions more frequently showed blunted cortisol responses to the TSST compared to those who experienced microaggressions less frequently (*p*=.012). There was a significant interaction between frequency of microaggressions and ethnicity (*p*=.008), such that students of Latino and other ethnic backgrounds (e.g., biracial), who experienced microaggressions frequently, showed a blunted cortisol response compared to their Asian and White peers who also experienced microaggressions frequently. Additionally, students who were more sensitive to microaggressions showed a blunted cortisol response than those who were less sensitive to microaggressions (*p*=.04). There were no significant interactions between sensitivity to microaggressions and ethnicity (*p*=.12). Findings provide insight to the different ways in which experiences of ethnic microaggressions can impact biological markers of stress.

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183) Abstract 1148

RACISM-RELATED VIGILANCE IN CROSS-RACE SOCIAL FEEDBACK: THE ROLE OF PERCEIVED DISCRIMINATION AND INFLAMMATION

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A large body of research has documented disparate health outcomes between Black and White individuals. Cross-race social interactions, both positive (e.g. positive feedback from White individuals) and negative (e.g. discrimination) can evoke physiological responses, which then may impact Black individuals' health. Inflammation is one physiological mechanism through which race-related social distress can manifest. Racism-related vigilance (RRV), which refers the mental actions involved in preparing for and anticipating potential experiences of discrimination is a cognitive process that may be relevant to the ill-effects observed in cross-race interactions. Few studies have focused on RRV as a contributor to the relationship between discrimination and racial health disparities. Even fewer have investigated how RRV may be involved in positive cross-race interactions.

To address this gap in the literature, this study assessed the role of RRV in positive and negative cross-race social feedback situations in a sample of 22 Black individuals. Correlations between RRV, self-reported history of perceived discrimination (PD), and inflammation were also assessed. Data were collected from a larger neuroimaging study investigating Black individuals' neural responses to cross-race social feedback, in which participants received social feedback based on photos of themselves from "other participants"; however, feedback was fixed in advance. RRV was indexed by participants' reaction time (RTs) to acknowledging feedback from White or Black evaluators. Inflammation was assayed via levels of interleukin-6 (IL-6) measured in oral mucosal transudate, and the Perceived Ethnic Discrimination Questionnaire (PEDQ) assessed PD.

Higher PEDQ scores correlated with shorter RTs to feedback from White evaluators, regardless of feedback valence, suggesting heightened RRV in those with greater PD, $r = -.46$, $p < .05$. Vigilance was not related to IL-6 levels, $p > .05$. There were also no significant differences in RTs between positive and negative feedback conditions. Findings from this study provide initial evidence that a history of PD

is related to greater vigilance to feedback from White evaluators, irrespective of the valence. Using a larger sample, future studies should aim to replicate this effect and further examine the relationship between RRV and indices of health.

184) Abstract 1065

SENSORY PROCESSING SENSITIVITY IS A PREDICTOR OF STRESS REACTIVITY IN A HISPANIC POPULATION

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Background: The Highly Sensitive Person Scale measures sensory processing sensitivity: a person's overall reactivity to the environment (Aron & Aron, 1997). Those high in sensory processing sensitivity have been shown to have a more sensitive behavioral inhibition system (BIS), which produces greater physiological reactions to perceived threats and negative stimuli (Smoleweska, McCabe, & Woody, 2005). Past studies have also shown that adolescents with higher sensory processing sensitivity are more likely to have experienced biopsychological stress reactivity as children (Aron & Aron, 2012). Due to these past findings, we hypothesized that the predisposition to higher sensory processing sensitivity would predict higher stress reactivity in an adult population.

Method: Participants were recruited from multiple sections of a General Psychology undergraduate course. Of the 193 who participated (mean age = 20.4; SD = 3.9), 95% identified as Hispanic and 77% were female. All participants completed an online survey that included measures of sensory sensitivity (Highly Sensitive Person Scale; Aron & Aron, 1997) and stress reactivity (Perceived Stress Reactivity Scale; Scholtz, 2011). The PSRS asks subjects to indicate their general response to 23 scenarios (e.g., "When others criticize me...) by selecting one of three response options. The HSP asks participants to indicate the extent to which they identify with 27 items (e.g., "Do you find it unpleasant when you have a lot going on at once?").

Results: To examine whether sensory sensitivity predicted stress reactivity, we conducted a two-stage hierarchical regression, controlling for gender. In the first step, gender accounted for 10% of the variance in stress reactivity $F(1,191) = 21.2$, $p < .001$. In the second step, sensory sensitivity accounted for an additional 28% of the variance in stress reactivity, $F(1,190) = 85.0$, $p < .001$. The final model accounted for 38% of the variance in stress reactivity.

Conclusion: Our results supported our hypothesis that greater sensory processing sensitivity is a predictor of higher stress reactivity. This contributes to the clinical literature in that symptoms of mental ailments such as general anxiety disorder can be better understood if mediated by sensory sensitivity.

185) Abstract 1357

INTERGENERATIONAL TRANSMISSION OF TRAUMA AND PHYSICAL HEALTH OUTCOMES IN AFRICAN AMERICANS AND NATIVE AMERICANS: A SYSTEMATIC REVIEW

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Background: Throughout history, African-American and Native-American communities have experienced high levels of stress/trauma exposure (e.g., systematic violence, loss). These same communities also have significantly worse physical health outcomes (e.g., asthma, diabetes, cardiovascular disease) when compared to other racial ethnicities. This review examines the literature on intergenerational transmission of parental stress/trauma exposure across generations that may contribute to physical health outcomes in these two populations.

Methods: A systematic search of electronic databases (i.e., PsycInfo, PubMed, CINAHL, Scopus, and Web of Science) and grey literature will be conducted in order to identify empirical studies addressing the intergenerational associations between parental stress/trauma exposure and physical health outcomes in African- and Native-American children. Inclusion criteria will require at least two generations of respondents from the same family with parental stress/trauma assessments evaluated in relation to at least one physical health outcome assessed in the offspring.

Results: To date, few studies have directly examined the associations between parental stress/trauma and child health outcomes. Preliminary findings suggest that parental stress/trauma may be associated with their children's physical health through behavioral, biological, and psychological pathways.

Conclusions: Addressing root causes of stress/trauma in the African-American and Native-American populations and providing support to minimize them may be valuable approaches to reducing physical health disparities in next generation offspring. Further research is needed to examine deliberately, the role of historical, lifetime, and ongoing stress/trauma on the health of subsequent generations.

186) Abstract 1280

USING THE DYNAMIC BIOPSYCHOSOCIAL MODEL TO ANALYZE CONTEMPORARY LGBTQ HEALTH CONCERNS

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The dynamic biopsychosocial model of health (Lehman, David, and Gruber, 2017) posits that human health is affected by an interplay of biological, psychological, and social factors as well as contextual dynamics that change over time. This model builds on the biopsychosocial model by integrating systems theories to highlight the fact that health, and the factors that influence health, fluctuates dynamically with time. Research on LGBTQ health is relatively underdeveloped, but a growing understanding of LGBTQ health disparities, and the priority on LGBTQ health identified by Healthy People 2020, have helped LGBTQ health disparities to become a national priority.

The goal of this theoretical inquiry is to examine contemporary LGBTQ health issues within the context of the dynamic biopsychosocial model, and to highlight unique healthcare, research, and policy needs. This analysis is informed by an extensive review of the LGBTQ health literature. Factors such as minority stress and oppression contribute to biological, psychological, and interpersonal aspects of the lives of LGBTQ people and contribute to health. This work explores three contemporary issues related to the LGBTQ community, namely 1.) LGBTQ aging, 2.) contemporary gender identity, and 3.) prevention and management of HIV/AIDS.

Although all three of the above issues are analyzed, the topic of LGBTQ aging is used here for illustration. The growing number of LGBTQ older adults necessitates consideration of the unique health needs of this community. For example, LGBTQ older adults are less likely to have children who can help care for them later in life, resulting in more long-term care outside of the home. This interpersonal pattern can promote loneliness and depression and raise the risk of chronic illnesses, which are especially prevalent among LGBTQ-identifying older adults. Similarly, doctor-patient interactions that are affected by discrimination, including the misdiagnosis of LGBTQ-related health problems, may exacerbate these associations. This topic is further developed, and similar analyses of contemporary issues related to gender identity and HIV/AIDS in the LGBTQ community are presented. Future directions and LGBTQ health-related policy are discussed.

187) Abstract 1299

SOCIODEMOGRAPHIC AND LIFETIME STRESS EXPOSURE CHARACTERISTICS OF INCARCERATED SEX OFFENDERS IN BRAZIL

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Background: Sexual violence is a serious public health problem in Brazil, but little is known about the life circumstances of individuals who perpetrate such crimes. To address this issue, we studied the lifetime stress exposure history of incarcerated sex offenders in Brazil. **Methods**: Participants completed the Stress and Adversity Inventory (STRAIN) in Brazilian Portuguese, and the Achenbach System of Empirically Based Adult Assessment Self-Report, as well as questions assessing sociodemographic and criminal history. 64 largely uneducated (62.5% incomplete elementary school, 15.6% complete elementary school, 14.1% incomplete high school, 4.7% complete high school, and 3.1% incomplete higher education), racially diverse (42.2% white, 26.6% afro-descendant, and 31.3% other) incarcerated male sex offenders (Mage=40.73, SD=10.72) participated in the study. **Results**: The Achenbach System did not identify any indicators of clinical symptomatology. Vis-à-vis the STRAIN, participants experienced an average of 37.36 lifetime stressors (SD=12.68), with an average overall lifetime severity of 89.17 (SD=27.49). These stress levels were significantly greater than those we previously obtained in a comparison sample of 330 adults from the Brazilian general population (Stressor Count: M=22.62, SD=13.29, d(ES)=1.13, r=0.49, p<.001; Stressor Severity: M=57.52, SD=32.51, d(ES)=1.0513, r=0.46, p<.001). Moreover, these differences in lifetime stress exposure levels between the two groups were observed occurring across the entire lifespan: Prenatal (Offenders: M=1.17, SD=1.20 vs. General Population: M=.70, SD=1.08, d(ES)=.41, r=.20, p=.001), Childhood (Offenders: M=5.66, SD=5.74 vs. General Population: M=3.35, SD=3.81, d(ES)=.47, r=.23, p=.01), and Adulthood (Offenders: M=30.53, SD=9.09 vs. General Population: M=18.57, SD=11.82, d(ES)=1.13, r=.49, p<.001). **Conclusions**: Corroborating data from other international studies, we found no clinical indicators that discriminated sex offenders from the general population. However, a majority of sex offenders were uneducated. Moreover, their lives were marked by significantly more stressors during every developmental period, suggesting general fragmentation in the lives of sexual offenders. Reflections on family and public support for formal education and adequate human development are discussed as potential protective factors.

188) Abstract 1682

THE RELATIONSHIP BETWEEN STRESS GENERATION AND CORTISOL SECRETION IN INDIVIDUALS AT-RISK FOR DEPRESSION

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Depressed and at-risk individuals have been shown to generate stress within their own environments, termed 'stress generation' (Hammen, 2006). Past research has linked distal biological risk factors for depression, such as the serotonin transporter-linked polymorphism (5-HTTPLPR), with stress generation (Starr et al., 2012, Vrscheck-Schallorn et al., 2013). However, no studies to date have examined whether proximal biological risk factors, such as dysregulated cortisol secretion (the hormonal endpoint of the Hypothalamic-Pituitary-Adrenal (HPA) axis), are related to stress generation. We predict, based on past research on cortisol secretion and risk for depression (Dienes et al., 2013; Adam et al., 2010), that a rapid increase in cortisol in response to an acute laboratory stressor, a larger cortisol awakening response (CAR,) and a high flat slope of diurnal cortisol secretion will be related to stress generation, but only for those with high levels of depressive symptomatology. Participants were 60 students at a Midwestern university in the USA, 66.7% female, ranging in age from 18 to 56. Mean diurnal cortisol slope and CAR were assessed using salivary cortisol samples taken at waking, 30 min, 60 min and 12 hours post waking across two days. Cortisol samples were taken at baseline, post-task and 10, 25 and 40 minutes post-task across the TSST. The UCLA Life stress interview (LSI: Hammen et al., 1991) was administered, and dependency of stressful life events over the past 12 months was rated in teams of 3 trained raters. Contrary to prediction, dependent stressful life events were not significantly related to cortisol secretion (diurnal, TSST, CAR) when moderated by depressive symptomatology (Beck Depression Inventory: BDI). However, a significant gender by dependent stress interaction was found in the prediction cortisol secretion across the TSST. Males with higher levels of dependent stress had blunted cortisol secretion compared to males with lower levels of dependent life stress and females. Males characteristicly have greater cortisol secretion across the TSST than females (Allen et al., 2017). The pattern of nonresponse to the TSST by men with high levels of dependent stressful life events may indicate a stronger impact of dependent stress on HPA axis functioning in males.

189) Abstract 1676

THE RELATIVE IMPACT OF CHRONIC AND EPISODIC STRESSFUL LIFE EVENTS ON THE CORTISOL AWAKENING RESPONSE

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Chronic stress leads to wear and tear on the body including alterations in Hypothalamic-Pituitary-Adrenal (HPA) axis functioning (Miller et al., 2007). However, a comparison of the relative impact of chronic and episodic stressful life events on HPA axis functioning has yet to be conducted. The Cortisol Awakening Response (CAR) is an elevation in cortisol (the hormonal endpoint of the HPA axis) that occurs 30-60 minutes after wakening and has been shown to be sensitive to psychosocial stressors in past research (Stalder et al., 2016). The aim of the current study was to compare the impact of both chronic and episodic stress (and type of chronic stress) on the CAR, predicting that chronic stress, because of its repetitive nature, would have a greater impact than episodic stressful life events, even though they may be more severe. Participants included 57 students at a university in the USA who completed the UCLA Life Stress Interview (LSI: Hammen et al., 1991). Salivary cortisol samples were collected over two consecutive weekdays: upon awakening, 30 minutes post awakening and 60 minutes post awakening. Chronic stress was found to have a stronger association with the CAR compared to episodic stress. Types of stress (e.g. close friend, family, neighborhood) did not differentially impact the CAR. However, men had a larger CAR compared to women ($p < .05$), and greater chronic stress was associated with a larger CAR for males, but did not affect the CAR for females. These results indicate that chronic stress may have a stronger impact upon HPA axis functioning than episodic stress, and a stronger effect on HPA axis functioning for males compared to females.

190) Abstract 1717

CUMULATIVE LIFE STRESS COMPOUNDS THE EFFECTS OF DAILY STRESSORS ON NEGATIVE AFFECTIVE REACTIVITY AND PHYSICAL SYMPTOMS: FINDINGS FROM MIDLIFE IN THE UNITED STATES STUDY

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Background. Cumulative life stress across multiple domains has been associated with poor mental and physical health, engagement in unhealthy behaviors, and advanced cellular age. These effects typically

exceed the negative effects of stress from individual domains on health. The current investigation tests whether cumulative life stress compounds negative affective (NA) reactivity and reported physical symptoms (symptoms) on days with stressors compared to days without stressors.

Methods. The Midlife in the United States (Wave II) and its National Study of Daily Experiences (NSDE II) was conducted in 2004-2006 and represents 2,022 respondents. NSDE II assessed work stress, work-family spillover, financial stress, perceived inequality, relationship stress and family problems over the past year, discrimination and neighborhood disadvantage. Each stress scale summary score was standardized, then summed and restandardized for a cumulative life stress score. The NSDE II assessed the occurrence of stressful events for 8 consecutive days and reported negative affect for the day (14 items, possible range 0-64), and symptoms of head and body aches, digestive issues, the common cold and the flu (sum score of 20 possible items).

Results. Multilevel models revealed significant interactions between cumulative life stress and daily stressor occurrence on NA and symptoms, covarying age, sex, race, and education. On stressor-free days, an increase in 1 SD in cumulative life stress significantly increased estimated NA by 0.66 units (.95CI = 0.50, 0.82) and symptoms by 0.31 (.95CI = 0.22, 0.40). On days with stressors, NA increased 2.33 units (.95CI = 2.22, 2.45) at mean life stress, and a 1 SD increase in cumulative life stress significantly increased NA reactivity by 0.58 units (.95CI = 0.46, 0.69). Similarly, symptoms significantly increased by 0.32 (.95CI = 0.27, 0.37) on days with stressors at mean life stress, and an additional 0.12 (.95CI = 0.07, 0.17) units increase for each 1 SD unit increase in life stress.

Discussion. Cumulative life stress is related to worse negative affect and greater symptoms on a daily basis. In light of research that demonstrates that daily NA reactivity and symptoms predicts poor health outcomes in the future and early mortality, results indicate the need to identify for whom daily experiences are worse to appropriately target interventions.

191) Abstract 1769

MULTIOMICS PROFILING OF LIFE COURSE STRESS AND ADVERSITY

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Background: Stress and adversity over the lifespan has effects on physical health, yet the molecular mechanisms remain poorly understood. Longitudinal multiomics profiling is an innovative method of molecular discovery using emerging technologies including metabolomics, proteomics, immunomics (including cytokine profiling). Our hypotheses were that total life stress and early life stress would be associated with increased inflammation, and that deeper molecular profiling would reveal molecular differences between measures.

Method: 50 participants enrolled in the longitudinal integrative Personalized Omics Profiling (iPOP) study were administered the Stress and Adversity Lifetime Inventory (STRAIN) which assesses stress and adversity over the life course including the perceived stressfulness of the experiences. We used the measures of total lifetime stress and early life adversity including both count and perceived stress. Participants in the study also underwent deep molecular profiling which was performed quarterly. The profiling included clinical labs and multiomics measures (cytokines, proteins, metabolites). We used linear mixed models to evaluate the relationship of life course stress measures and inflammation (high sensitivity C-reactive protein (hsCRP) as well as multiomics measures. Correction for multiple association testing was performed by calculating the false discovery rate q-value.

Results: Inflammation as measured by hsCRP was associated with all four stress measures. When evaluating multiomics associations the strongest associations were seen with metabolites, but there was a differences in metabolite associations with overall lifetime stress measures and early lifetime stress measures. In particular, several lysophosphatidylcholine metabolites were associated with overall stress. The early life stress measures had different metabolite associations which included gluconic acid, kynurenic acid and allantoin. They also had associations with a large number of cytokines in contrast to the total life stress measures.

Conclusion Multiomics profiling provides novel insights into the molecular associations underlying the physical effects of stress. The approach confirms known associations and provides a platform for discovery of novel molecules which can then be further investigated in mechanistic studies.

192) Abstract 1234

SUBJECTIVE IMPRESSIONS MATTER: THE RELATIONSHIP OF TRAUMATIC AND STRESSFUL LIFE EVENTS AND PTSD SYMPTOMS IN YOUNG AND MIDDLE AGE ADULTS

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Background:

Traumatic and stressful life events may contribute to the development of post-traumatic stress disorder (PTSD) symptoms and other adverse health outcomes. However, PTSD-related research commonly focuses on the objective measures of traumatic and stressful events, i.e. whether or not an event has occurred. In the current study of healthy young and middle age adults we evaluated both the objective measure of traumatic and stressful life events and the past year subjective impressions of these events. We hypothesized that the past year subjective impressions of traumatic and stressful events would have a stronger association with the current PTSD symptoms than the objective measure of these events.

Methods:

This was a cross-sectional study of 100 consecutive patients aged 18-41 years recruited in a large primary care practice. Traumatic and stressful events were evaluated using the Life Stressor Checklist-Revised (LSC-R). The objective measure of the LSC-R evaluated lifetime history of traumatic and stressful events; the subjective measure of the LSC-R evaluated participants' rating of the degree to which the occurred events were bothersome within the past year. Current PTSD symptoms were evaluated using the PTSD Checklist - Civilian Version (PCL-C). The relationships between the objective and subjective LSC-R and PCL-C scores were examined using generalized linear models.

Results:

The participants (41% males and 59% females) were 43% White, 30% Hispanic, 14% Black, and 13% of other race. Ninety-five percent of the participants reported having experienced at least one traumatic or stressful event in their lifetime; and 77% reported having experienced two or more events. When adjusting for age, sex, and race, the objective measure of LSC-R was significantly associated with PCL-C scores (partial $R^2 = 0.21$, $p<0.001$). However, the subjective measure of LSC-R was more strongly associated with PCL-C scores when adjusted for the same covariates (partial $R^2 = 0.30$, $p<0.001$).

Conclusions:

In young and middle age adults, the past year subjective impressions of traumatic and stressful life events had a stronger association with current PTSD symptoms than the objective measures of these events. These findings emphasize the need for researchers and clinicians to account for the subjective impressions of traumatic and stressful life events in their work.

193) Abstract 1510

STRESSED BODY, STRESSED MIND: LONGITUDINAL INVESTIGATION OF TELOMERE LENGTH ASSOCIATED WITH CANCER-RELATED STRESS AMONG FAMILY CAREGIVERS OF ADULT PATIENTS

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Background: Family members often become primary caregivers for cancer patients with little advanced notice. Cumulating evidence suggests that family caregivers providing support to cancer patients are at risk for increased psychosocial stress, which has long-term consequences to both mental and physical health. Increased stress has been manifested in cellular aging, as measured by telomere length. Unknown is the extent to which telomere length affects increased cancer-related stress, and vice versa, which the current study aimed to examine among family cancer caregivers.

Method: Caregivers (N=131, *M*=51 years old, 44% female, 34% Hispanic, 24% patient's spouse) of newly and recently diagnosed colorectal cancer patients provided blood samples and completed questionnaires around 3 months (T1), 1 year (T2), and 2 years (T3) after the patient's diagnosis. Leukocyte telomere length (TL) was assayed from the blood samples, and perceived cancer-related stress (Appraisal of Cancer Experience Scale) was self-reported, at all three timepoints.

Results: Caregivers displayed TL that are comparable to caregivers of transplant patients and shorter than healthy counterparts. Cross-lagged panel longitudinal analysis using SEM framework revealed that prior TL values were significantly predictive of subsequent TL values at one-year and two-year follow-ups (βs = .422 and .569, $p < .001$), whereas only caregiver stress at T2 was significantly predictive of that at T3 ($\beta = .590$, $p < .001$). Furthermore, longer TL at T1 was associated with greater caregiver stress at T2 ($\beta = .321$, $p < .008$); and greater caregiver stress at T2 related to longer TL at T3 ($\beta = .262$, $p < .03$).

Conclusion: Findings provide preliminary evidence of the bidirectionality between telomere length and cancer-related stress among caregivers. Telomere length around the time of diagnosis was predictive of caregiver stress at one-year follow-up, which suggests that caregivers with longer telomeres may be vulnerable to perceiving greater stress over time. While stress has been linked to accelerated telomere shortening, caregivers' stress may not necessarily expedite this process, as seen during the two-year follow-up. Results warrant further investigation of associated demographic (age and sex) and behavioral (physical activity) factors that promote or attenuate cellular aging during the caregiving trajectory.

194) Abstract 1818

VIGILANCE TOWARDS ENVIRONMENTAL TARGETS OF VARYING THREAT AND CARDIOVASCULAR RESPONSES

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OVERVIEW: Stress research has evolved from studying stress as a response to specific events (e.g., trier social stress test) to its conceptualization as a process humans engage in daily. Vigilance reflects a sensory intake process akin to Lazarus and Folkman's conceptualization of stress appraisal where an environment is scanned for threats and/or a potential threat is continually monitored and reappraised in order to detect any change in threat status. Although vigilance may be an adaptive behavior, sustained vigilance or hypervigilance may have important health consequences. A central aspect of the hypothesis is that greater perceived threat will evoke more vigilance and blood pressure reactivity.

AIM: The current aim is to test the hypothesis that greater environmental threat will evoke more substantial levels of vigilant behavior and larger cardiovascular responses. In addition, we hypothesize that more challenge and threat stimuli will evoke distinct cardiovascular reactivity patterns (myocardial vs. vascular, respectively).

METHODS: The current study uses threat-based videogames to manipulate visual vigilance demands with expected cardiovascular implications. A sample of 120 (60 women) young adults participate in a lab study involving a vanilla baseline, 30-min of continuous videogame play, and a 10-min recovery. Participants are randomized to play one of three games representing different levels of threat. Eye-tracking (Tobii X2-60), blood pressure, and impedance cardiography are collected throughout.

RESULTS/CONCLUSION: The study is expected to be completed by the APS Conference. We intend to report on condition differences in 1) eye-tracking-assessed visual vigilance parameters including total attention time, saccades, and fixation times, 2) cardiovascular reactivity and recovery including BP and impedance-derived indices, and 3) moderation of objectively-assessed vigilance on cardiovascular reactivity and recovery. Implications for the study of stress and stress-related disease will be discussed.

195) Abstract 1310

A STRESSORS-CHARACTERISTIC PERSPECTIVE ON THE RELATIONSHIP BETWEEN LIFETIME STRESS EXPOSURE AND DOCTOR-DIAGNOSED HEALTH OUTCOMES

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Hans Selye defined stress as "the nonspecific response of the body to any demand" (Selye, 1956). For the past 60 years, stress research has been heavily dominated by this view, paying little attention to differential effects among stressors. More recently, though, researchers have begun adopting a *stressor-characteristics* perspective, which hypothesizes differential effects by stressor type (e.g., Kemeny, 2003). The present study adopted this perspective and examined how varying stressors are differentially related to negative health outcomes.

205 adults (M_{age} = 37.82, SD_{age} = 11.72; 52% female) from a community sample (85% white) reported on both doctor-diagnosed general health problems (e.g., asthma, cancer, depression, high blood pressure) and doctor-diagnosed autoimmune disorders (e.g., inflammatory bowel disease, rheumatoid arthritis, lupus). Participants also completed the Stress and Adversity Inventory for Adults (STRAIN; Slavich & Shields, 2018), an online system that measures exposure to 55 different stressors that can occur over the lifespan and impact health. For each stressor that is endorsed, a series of follow-up questions establish the specific timing, severity, frequency, and duration of the stressors.

To avoid overlap with the outcomes studied, the 5 health-related stressors (e.g., major medical hospitalization) of the STRAIN were excluded from analyses. Poisson regression analyses were then used to test if the 50 remaining stressors significantly predicted doctor-diagnosed general health problems and autoimmune disorders. 41 stressors were significantly associated with general health problems ($p<.05$, 40 with $p<.001$), with odds ratios ranging from 1.34-2.53. 19 stressors were significantly associated with autoimmune disorders ($p<.05$, 6 with $p<.001$), with odds ratios ranging from 1.92-11.48. The strongest predictors of general health problems were infertility and emotional abuse, whereas for autoimmune disorders, they were the death of a loved one and ongoing arguments with a spouse or partner.

These findings reaffirm the importance of studying the effects of stress from a stressor-characteristics perspective. Future directions include developing a top-10 stressor STRAIN screener based on these results. The screener could be used in clinical settings—where expediency is required—to see if additional in-depth stress assessment is indicated.

196) Abstract 1372

THE STRESS AND ADVERSITY INVENTORY FOR ADULTS (ADULT STRAIN) IN GERMAN: AN INITIAL VALIDATION

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Acute and chronic stress has long been identified as a key determinant of adverse mental and physical health outcomes, but few stress assessment instruments cover the entire lifespan. The Stress and Adversity Inventory for Adults (STRAIN) is an online interview-based stress assessment system that addresses this issue by quantifying the number and severity of major stressors experienced over the entire life course. Here, we present the initial validation of a German translation of the STRAIN. To accomplish this, we conducted an online survey of 298 individuals (81 men, 217 women) with a mean age of 30.3 years. The German version of the STRAIN demonstrated excellent concurrent validity, as evidenced by strong associations with other instruments assessing early adversity (ACE, CTQ: $|rs|\geq.62$, $|\beta s|\geq.51$, $ps\leq.05$). The German STRAIN also correlated strongly with instruments assessing recent life event exposure in adulthood (LEC-5: $|rs|\geq.48$, $|\beta s|\geq .20$, $ps\leq.05$), as well as recent perceived stress (PSS:$|rs|\geq .25$, $|\beta s|\geq.20$, $ps\leq.05$), and recent chronic stress levels (TICS: $|rs|\geq .19$, $|\beta s|\geq.32$, $ps\leq.05$). In terms of predictive validity, the STRAIN strongly predicted participants' current anxiety ($|rs|\geq .22$, $|\beta s|\geq.17$, $ps\leq.05$) and depressive symptom levels ($|rs|\geq .33$, $|\beta s|\geq.24$, $ps\leq.05$). These results provide the first indication that the German version of the STRAIN is a valid tool for assessing individuals' exposure to stress over the life course. Future studies will test the extent to which the STRAIN predicts stress reactivity and physical health outcomes.

197) Abstract 1137

USING THE STRESS AND ADVERSITY INVENTORY (STRAIN) TO ASSESS LIFETIME STRESS EXPOSURE IN CLINICAL SETTINGS

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INTRODUCTION: Life stress plays a central role in the etiology, progression, and/or maintenance of several major mental and physical health problems (Cohen et al., 2007). Assessing and managing stress in clinical settings can reduce stress-related chronic disease burden, but stress is rarely measured in clinical practice. Moreover, even when stress *is* measured, it is typically done using instruments with well-known psychometric limitations (Slavich, 2018). The Stress and Adversity Inventory (STRAIN) is an NIMH/RDoC recommended instrument for assessing lifetime stress exposure that can address these methodological issues by providing clinicians with an easy-to-use, evidence-based system for assessing individuals' stress exposure in research and clinical settings.

VALIDATION DATA: The STRAIN has been validated in 11 studies to date and is currently used in 146 studies. These studies have shown that greater lifetime stress exposure predicts a variety of health-related outcomes that are relevant for clinical settings, including doctor-diagnosed mental and physical health problems, and self-reported mental and physical health complaints in the general population (Slavich & Shields, 2018).

CLINICAL APPLICATION: In less than 20 minutes, patients can take the STRAIN online via a secure HIPAA-compliant website. Providers then receive an easy-to-read report that they can review with their patients in the context of a stress assessment and management consultation session. Since stress is known to play a central role in the activation of biobehavioral pathways that promote a variety of health problems, the STRAIN can enable clinicians to quickly assess the impact that stress may be having on patients' presenting problems while also highlighting potentially unrecognized risk factors for poor health. STRAIN-based clinical assessments can thus help reduce morbidity and improve diagnosis and treatment planning, while also enhancing clinical history-taking and person-centered care. Guidelines, benefits, and implications related to this application are discussed.

CONCLUSION: The STRAIN can help healthcare providers assess patients' lifetime stress exposure levels in a way that may enhance case conceptualization, diagnosis, and treatment planning, thus reducing stress-related disease burden. The STRAIN may also help improve patients' perceived quality of care.

198) Abstract 1240

THE STRESS AND ADVERSITY INVENTORY FOR ADULTS (ADULT STRAIN) IN BRAZILIAN PORTUGUESE: OVERVIEW AND INITIAL VALIDATION

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Background: Many studies have correlated current stress levels with mental and physical health problems, but there remains a paucity of research on how stress exposure across the entire lifespan affects health. To address this issue, the *Stress and Adversity Inventory for Adults (Adult STRAIN)* was developed. Here, we report on its translation and initial validation in Brazilian Portuguese. **Objective**: To assess lifetime stress exposure in Brazilians using the translated Adult STRAIN. **Methods**: 330 Brazilian adults (92 males, 238 females, Mage=32.16, SD=13.55) completed the STRAIN, Child Trauma Questionnaire-Short Form (CTQ-SF), Perceived Stress Scale (PSS), and measures of socioeconomic status, personality, social desirability, negative affect, physical and mental health complaints, sleep quality, executive function, and doctor-diagnosed general health problems and autoimmune disorders. **Results**: On average, the STRAIN was completed in 16 min 27 s. The STRAIN showed good convergence with CTQ-SF and PSS ($r_s\geq.385$) and did not correlate with social desirability. When compared with the CTQ-SF and PSS, the STRAIN demonstrated better discriminant validity on measures of personality. With respect to predictive validity, the STRAIN significantly predicted more physical ($r_s=.407$, $p<.001$) and mental ($r_s=.485$, $p<.001$) health complaints, worse sleep quality ($r_s=.409$, $p<.001$), and a greater number of doctor-diagnosed general health problems (Incidence rate ratio [IRR]=1.027, IC 95% = 1.020-1.034, $p<.001$) and autoimmune disorders (IRR=1.031, IC 95% = 1.005-

1.056, p=.017). The STRAIN was unrelated to executive function (p=.713). For each stressor endorsed in the STRAIN, participants were 2.7% more likely to have a doctor-diagnosed general health problem and 3.1% more likely to have a doctor-diagnosed autoimmune disorder. The STRAIN also exhibited great test-retest reliability, especially with respect to its two main outcomes (i.e., Total Count and Total Severity of Lifetime Stressors; $r_{icc} \geq .936$). **Conclusions**: The STRAIN demonstrates very good acceptability and usability, and excellent discriminate and predictive validity. It may thus be a useful instrument for Brazilian researchers and clinicians seeking a practical tool for assessing lifetime stress exposure and producing personalized life charts that can be used for case conceptualization and treatment planning purposes.

199) Abstract 1156

IS THE USE OF UNSOLVABLE ANAGRAMS OR THE SING-A-SONG STRESS TEST A RELIABLE WAY TO ELEVATE STRESS?

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Studies that want to cause laboratory induced stress often use the psychosocial stressor known as the Trier Social Stress Test (TSST). The TSST reliably elevates self-rated and physiological measures of stress; however, it requires a large amount of man power to run each visit. During the TSST a participant is asked to undergo a mock job interview in front of a panel of three judges. Therefore, between the research assistant who runs the visit, the participant, and the judges, there are five individual schedules that must be coordinated. Several laboratories have used other methods, such as unsolvable anagrams or a modified version of the TSST known as the Sing-a-Song Stress Test. There are, however, no studies that have directly compared whether these two alternative techniques activate the stress response to the same extent as the TSST. The current study investigated whether unsolvable anagrams or the Sing-a-Song Stress Test elevated state anxiety and physiological measures of stress to the same extent as the TSST. As such, participants (n=27) were put into one of three stressor conditions: Unsolvable Anagram Task, Sing-a-Song Stress Test, or TSST and had self-rated state anxiety, salivary cortisol, heart rate, and systolic and diastolic blood pressure measured throughout the experiment. The results showed that systolic blood pressure was significantly higher in the TSST condition compared to the Anagram and Sing-A-Song Stress Test conditions ($F (6, 72) = 129$, $p = .02$). There was a main effect of time on heart rate, with an elevation in heart rate in all conditions immediately after the stressor ($F (3, 72) = 414$, $p = .01$). There was no significant effect of condition on self-rated anxiety, salivary cortisol, or diastolic blood pressure. These findings indicate that there is some activation of the stress response to completing unsolvable anagrams and the Sing-A-Song Stress Test, but not to the full extent of the TSST.

200) Abstract 1669

INITIAL DEVELOPMENT AND VALIDATION OF A BRIEF MEASURE OF CHRONIC STRESS

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Background: Global stress appraisals for acute and immediate periods of stress are measured with psychometrically sound instruments demonstrating predictive validity to capture the influence of psychological stress on health variables. Yet, the chronic experience of stress is more elusive to detect and current self-report measures include lengthy life event questionnaires or domain specific (e.g. work stress) inventories. As chronic stress has known influences on health variables, a brief inventory would be valuable for use in a clinic setting, which could indicate need for a longer assessment. We therefore developed and evaluated the Chronic Stress Scale (CSS), an initial item pool intended to briefly capture the perceived experience of chronic stress over the past 6 months.

Methods: Two undergraduate (n=579; n=357) and one Amazon MTurk (n=740) samples completed a questionnaire battery including: an initial 27-item pool for the CSS, Big Five Inventory-Neuroticism scale (BFI-N), Positive and Negative Affect Schedule-Positive Affect (PANAS-PA), and Perceived Stress Scale (PSS). Exploratory principal components analysis with Varimax rotation was conducted to identify a revised item pool, which was evaluated for reliability, discriminant, concurrent, and criterion validity.

Results: The final 12 items for the CSS replicated across samples and loaded onto three distinct factors capturing: environmental, interpersonal, and societal chronic stress. Internal consistency on a scale (Cronbach's α=.83, AIC=.29) and subscale (α=.94, AIC=.29.57) level was demonstrated for college and MTurk samples respectively. The CSS demonstrated appropriate initial convergent and discriminant validity with other validated scales, BFI-N (r=.50), PANAS-PA(r=.07), PSS(r=.66). Subscales demonstrated similar correlations. Findings from an additional sample, currently being collected, will be collected and analyzed prior to March 6.

Conclusion: Our initial evaluation suggests these 12 items hold promise as a brief measure of chronic stress. Further psychometric evaluation including stability over time is needed to support construct validity.

201) Abstract 1715

HOW MOBILE PHONE USE CORRELATES WITH LONELINESS, STRESS, AND SALIVARY ALPHA AMYLASE AS A STRESS BIOMARKER

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Objective: The goal of this study was to examine how potentially unhealthy mobile phone use (e.g., excess use and over-dependence) may be connected to feelings of loneliness, psychological stress and alpha amylase, a biomarker of stress. ***Methods:*** 146 subjects (mean age = 20.5 years, 83% female, 50% Asian) completed questionnaires assessing feelings of loneliness and stress, as well as assessments of their problematic mobile phone use (e.g., occupied with phone when should be doing other things), their feelings of involvement with the phone (e.g., thinking about the phone when not using it), and their dependence on their mobile phone (e.g., feeling unsettled when forgetting to bring mobile phone). Baseline saliva samples at two time points # minutes apart to assess alpha amylase (sAA), with the values averaged. ***Results:*** Correlational analyses revealed that participants with higher problematic mobile phone use reported *lower* feelings of loneliness ($r=-.271$, $p < .05$) and stress but had *higher* levels of salivary alpha amylase ($r=.568$, $p< .001$). Similarly, phone dependence was tied to *lower* self-reported stress and *higher*sAA ($r=.395$, $p < .001$), but there was no association with loneliness. Finally, the direction of effects flipped for feelings of phone involvement which was tied to *higher* self-reported stress, *lower* sAA ($r = -.418$, $p<.001$), and again no ties to loneliness. Follow up linear regression analyses revealed that these associations held after accounting for sex, age, and ethnicity. ***Conclusions:***Taken together, problematic and dependent mobile phone use is associated with lower self-reported loneliness and stress, however these associations flip directionality when considering biological stress. Interestingly, feeling very involved with your phone was tied to heightened biological stress, but not psychological. Clearly, future work is needed to further explore how our complex relationships with our phones influence our health.

202) Abstract 1075

YOU'RE STRESSED, I'M STRESSED: SPILLOVER AND CROSSOVER EFFECTS OF WORK STRESS AMONG PARAMEDICS AND THEIR SPOUSES

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Background: Previous research suggests that stress can be transmitted across settings (spillover) and between people (crossover). The objective of the current study was to examine these processes in paramedics and their spouses.

Methods: 87 full-time paramedics and their spouses participated in an intensive longitudinal study involving up to 3 assessments per day, across 4 consecutive work days. Each day, paramedics reported their experiences during their shift and these were used to predict subsequent perceived stress and mood of the paramedics and their spouses. Data were analyzed using multilevel modelling incorporating both actor and partner effects.

Results: Paramedics who reported more occupational stressors, greater perceived stress, and worse negative affect at work tended to report greater perceived stress and worse negative affect after their work shift ended. Their spouses were also affected by the paramedics' experience with stress at work. Spouses of paramedics who reported more occupational stressors and greater perceived stress at work, tended to report greater perceived stress and worse negative affect after the paramedic came home from work.

Conclusions: These findings suggest multiple pathways through which daily work-related stress and mood may impact home and family contexts. Possible mechanisms for these effects and implications for recovery are discussed.

203) Abstract 1659

RESPIRATORY SINUS ARRHYTHMIA IN SOCIAL INTERACTIONS: EFFECTS OF INTERACTION VALENCE AND SELF-REGULATION

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Cardiac parasympathetic processes may contribute to effects of interpersonal experiences on cardiovascular disease. Respiratory sinus arrhythmia (RSA), measured as high frequency heart rate variability (hfHRV), is an indicator of cardiac parasympathetic functioning. Two theories describe how social interactions affect RSA. In the Neurovisceral Integration Model (NVIM; Thayer & Lane, 2000) effortful self-regulation increases RSA. In Polyvagal Theory (PVT; Porges, 2001) interaction valence influences RSA, specifically social safety or threat evoke increases and decreases in RSA, respectively. This study tests effects of self-regulatory effort and interaction valence on RSA during social interaction, where valence was controlled with a video-recorded confederate. Undergraduates (N = 106; 46 males) were randomly assigned to conditions differing by Valence (i.e., safe/positive, neutral, or threatening/negative) and Self-Regulation effort (i.e., high or low) as they discussed an emotional topic. Valence had expected effects on change in state anger, $F(2, 94) = 30.9$, $p < .001$, $\eta_p^2 = .40$, and anxiety, $F(2, 94) = 11.6$, $p < .001$, $\eta_p^2 = .20$, and on perceptions of confederate positive (M = 4.00) and negative behavior (M = -3.89). Self-Regulation had expected effects on self-reported self-regulatory effort, $F(1, 94) = 106.6$, $p < .001$, $\eta_p^2 = .53$. In a significant effect of Valence on hfHRV during the interaction, $F(2, 76) = 9.1$, $p < .001$, $\eta_p^2 = .19$, negative interactions evoked parasympathetic withdrawal (M = -1.36) that differed from neutral (M = -0.18) and positive (M = -0.47) interactions. Self-Regulation did not alter hfHRV during the interaction. However, in a significant Valence x Self-Regulation interaction during only the first minute of post-task recovery, $F(2, 78) = 4.7$, $p < .05$, $\eta_p^2 = .11$, after the negative interaction, participants in the high Self-Regulation condition displayed an increase in hfHRV over baseline (M = .51) whereas those in the low Self-Regulation condition displayed a continuing decrease (M = -.90). Thus, regarding PVT, the valence of interpersonal interactions had expected effects on RSA during and shortly after negative interactions, but positive interactions did not produce increased RSA. Regarding the NVIM, self-regulation did not alter RSA during interaction, but the expected increase in RSA was seen shortly after negative interactions.

204) Abstract 1111

THE WEIGHT-RELATED MICROAGGRESSION EXPERIENCES QUESTIONNAIRE: ITEM DEVELOPMENT AND INITIAL EVALUATION

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The experience of stigmatization-related stress incurred by individuals of higher weight [i.e., possessing a body mass index (BMI) of $\geq$25] has been linked to poor mental and physical health outcomes. To date, most research has focused on the effect of explicit forms of discrimination toward such individuals. However, the more subtle, suggestive expressions of weight-related prejudice (i.e., "microaggressions") have gone relatively under studied, and as such, it remains unknown to what degree the experience of less explicit forms of everyday encounters with weightism may influence one's mental and physical well-being. As a vital first step, the purpose of this study is to begin the development of a psychometrically sound measure grounded in established microaggression theory. An initial pool of items was generated by adapting items from existing measures, content analysis of focus group responses with members of the target demographic, and rational deduction from the conceptualization of the construct. These techniques resulted in an initial item pool of 69 items, which were administered to 547 adult participants (69% White) with a mean self-reported BMI of 34.5 (SD = 7.06) . All items were then submitted to a Principal Components Analysis (PCA) to identify meaningful components. Although 10 components were initially identified, further testing demonstrated 4 components to be appropriate. The first three dimensions were consistent with the extant microaggression literature: A) "Direct/Interpersonal Micro-Assault," B) "Direct/Interpersonal Micro-Insults," and C) "Direct/Interpersonal Micro-Invalidation." We also discovered a novel indirect/environmental component we termed "Media-Influenced Micro-Aggressions." Based on these results, we selected the 8 highest loading items for each component, resulting in the preliminary 32-item Weight-Related Microaggression Experiences Questionnaire (WRMEQ). The development and validation of this measure is a necessary foundation to explore how higher weight individuals are affected by perceived microaggressions. Future directions should focus on further validating the measure's construct validity as well as generalizability for use in different populations.

205) Abstract 1764

WE'RE IN THIS TOGETHER: AN EXPERIMENTAL TEST OF COMMUNAL APPRAISAL AND COPING INTENTIONS

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Background: The large theoretical and empirical literature on stress and coping primarily focuses on intra-individual processes. The vital role of close relationships in influencing psychosocial, physiological, and behavioral adaptation to stressors warrants greater attention. The construct of communal coping involves two processes: an appraisal of the stressor as shared (i.e., "our problem" as opposed to "my/your problem") and cooperative efforts to manage the stressor. Previous research has revealed that communal coping is associated with lower distress, fewer depressive symptoms, greater relationship quality, and fewer illness-related symptoms among samples with chronic illnesses. It is also associated with less alcohol use in at-risk samples and lower

cardiovascular arousal during healthy couples' conflict discussions. However, the current body of literature is entirely correlational and has yet to eliminate third variable or reverse causality explanations.

Method: Intended to provide a more definitive test of the effects of communal coping, the present controlled experiment was designed to test the effects of induced communal appraisal and coping intentions (CC - "our problem") in comparison to two non-communal conditions (NC-O - "my problem," NC-P – "partner's problem"). Individuals involved in an ongoing intimate relationship (N =133) were recruited to participate in a baseline assessment, two writings tasks designed to induce either a communal or a non-communal appraisal regarding a relationship conflict, and a one-week follow-up. Hypotheses based on the theoretical and correlational literature are that induced communal appraisal would: 1) produce lower perceived stress, less negative state affect, greater state relationship satisfaction after the second induction than the non-communal induction; 2) produce lower perceived stress, less negative affect, greater relationship satisfaction and fewer physical symptoms at the one-week follow-up than the non-communal inductions; 3) produce faster heart rate recovery after each writing session and lower heart reactivity in the second writing session, relative to the non-communal coping inductions. 4) The extent to which communion and attitudes toward emotional expression moderate these effects was examined. Data collection for the present study are complete and analyses will be completed prior to March 2019.

206) Abstract 1166

SOCIAL PRINCIPLES LINKING HUMAN AND MITOCHONDRIAL BEHAVIOR

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Background

Developing accurate models to predict and influence health/disease trajectories is a shared goal across the psychosocial and biological sciences. Although reductionist models have successfully been applied in some domains of biology, they fall short of explaining the dynamic behavior of elements across levels of organization – communities, people, cells, organs, cells, and organelles. This calls for integrative models informed by social principles, which most accurately reflect the evolutionary pressures responsible for shaping how complex organisms interact with each other and with their environment.

Methods

We identified conserved principles of social behavior from the social science literature. We then examined to what extent these principles apply at the cellular and sub-cellular level. Specifically, we examined if these principles apply to mitochondria, which are dynamic life-sustaining organelles with their own genome that populate the cell cytoplasm and sustain life and stress adaptation.

Results

As in human social networks, mitochondria communicate with each other and with the cell nucleus, diversify and functionally specialize, exhibit group behavior and interdependence, self-replicate, and have a life cycle marked by birth and death. Mitochondria are social organelles. Similarly, cells across different stress systems, including the brain, communicate and exhibit conserved "social" behaviors.

Conclusions

The extension of social principles across levels of biological complexity is a theoretical shift that emphasizes the importance of communication in adaptive physiological processes. This shift also leads to re-think causation in the biomedical sciences, invites a reconceptualization of disease biomarkers, and facilitates the cross-talk across psychosocial and biological sciences towards developing holistic and more accurate models of human health and disease.

207) Abstract 1799

OLDER COUPLES' EMOTIONAL AND PHYSIOLOGICAL RESPONSES TO DISCUSSING HOW THEY FIRST MET: ASSOCIATIONS WITH PSYCHOLOGICAL AND RELATIONAL WELL-BEING

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Given that 80% of Americans will be married by age 40 and that marital quality plays a role in determining morbidity and mortality, it is important to understand the interpersonal dynamics of marriage that affect health. Most work on marital quality and health has examined couples' conflict discussions. Here we focus on positive interactions, examining whether reminiscing about how the couple first met is related to both partners' health and well-being. The present study examined 98 married couples (ages 50 year or older) assessing both couple members. Blood pressure was recorded during a baseline period, and participants reported their baseline emotions, closeness, and perceived support. Blood pressure was then continuously monitored during the discussion. After the discussion, participants reported their emotions, closeness, and perceived support. In an earlier questionnaire in the mail, we assessed marital satisfaction and depressive symptoms. The main hypotheses were that greater positive emotions, perceived support, and closeness during the interaction would be associated with (a) greater marital satisfaction and lower depressive symptoms from the surveys and (b) lower blood pressure reactivity during the interaction. We hypothesized the opposite for negative emotions. We ran a series of mixed models in SPSS using the Actor Partner Interdependence Model. In support of hypotheses, participants who reported feeling closer to their partners during the interaction, controlling for baseline, also reported higher levels of marital satisfaction (B = 3.455; p = .004), and those whose partners reported feeling more supported during the interaction, controlling for baseline, reported greater marital satisfaction (B = 21.601; p = .049), and lower depressive symptoms (B = -12.378; p = .040). Unexpectedly, we found a positive relationship between closeness, controlling for baseline, and systolic blood pressure (B = 1.271; p = .051). These findings suggest that the quality of older couples' discussions about how they first met may be diagnostic of their psychological and relational well-being. Associations between relationship factors and cardiovascular reactivity during positive interactions may be more complex. Qualitative analysis is underway to better understand how the content of these conversations relates to indicators of health and well-being.

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208) Abstract 1499

THE INFLUENCE OF INTERPERSONAL GOALS ON PHYSICAL HEALTH OUTCOMES: EXAMINING THE ROLES OF SELF-COMPASSION AND HEART RATE VARIABILITY

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Background: Interpersonal goals, including compassionate and self-image goals, are approaches individuals use to meet desired social outcomes. Individuals with compassionate goals choose to support and not harm others out of a genuine desire to promote others' wellbeing, while individuals with self-image goals are motivated by creating, maintaining, and defending a desired image of the self. Interpersonal goals predict mental health, including self-compassion, as well as self-reported physical health; however, no research has yet examined biomarkers of health.

Method: The present study examined the associations between interpersonal goals and self-reported physical health (SRPH), as well

as the potential effects of self-compassion in 1017 young adults aged 18 to 30 (average age 19.64 yrs ± 1.91; 66.3% female; 69.2% white). A healthy subsample (N = 162; average age 19.62 yrs ± 1.78; 73.5% female; 66.7% white) screened for mental and physical chronic conditions participated in a lab visit in which heart rate variability (HRV) data were collected.

Results: Hierarchical regression analyses, controlling for the other interpersonal goal, body mass index, and sex, revealed compassionate goals was positively associated with SRPH even with self-compassion in the model (β = .21, p<.001). Self-image goals were negatively related to SRPH (β = -.16, p<.001), but the strength of that association reduced when self-compassion was included in the model (β = -.07, p=.05). Within the healthy subsample that came in to the lab, self-compassion was not related to SRPH. Compassionate goals were positively associated with SRPH (β = .13, p=.08), whereas self-image goals were negatively related to SRPH (β = -.15, p<.05). Further, compassionate goals predicted higher HRV (β = .14, p<.01) and higher HRV was linked to greater SRPH while controlling for both goals (β = .28, p<.05). HRV and self-image goals were not related.

Conclusions: Results suggest that having compassion for others may support better physical health potentially via greater activation of the parasympathetic nervous system, even while controlling for self-compassion. Focusing on maintaining a desired self-image may hinder physical health, but the effects may be driven by having lower self-compassion. Future work should investigate specific mechanisms by which goals influence our physiology to alter physical health.

209) Abstract 1719

A BURDEN TODAY, BUT A BOOST TOMORROW? A DAILY DIARY STUDY OF LINKS BETWEEN SOCIAL SUPPORT GIVING AND AFFECTIVE AND PHYSICAL WELL-BEING

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There is growing epidemiological evidence that giving support to others is associated with positive health outcomes and greater psychological well-being. Laboratory studies examining affective pathways through which support-giving influence well-being and health have yielded mixed findings. It is important to examine the well-being correlates of different types of support given in naturalistic settings. In this study, we examined whether giving more instrumental and emotional support than one does on average is associated with higher levels of affective and physical well-being on the same day and next day.

These connections were examined using daily experience data over an 8-day period from the National Study of Daily Experiences in the National Survey of Midlife in the U.S. Support-giving was measured by daily hours of instrumental and emotional support. Affective well-being was measured with the Positive and Negative Affect Scale, and physical well-being was assessed with a composite score of number of physical symptoms. Multilevel regression models examined between- and within-person variations in support given as predictors of same-day and next-day affective well-being and physical symptom experience.

On days when individuals gave more emotional support to others than their own average, they experienced greater levels of symptom severity on the same day (B=0.53; pGiving greater amounts of instrumental support than average was associated with greater levels of positive affect (B=.01; p<.001) on the same day. No significant associations were found between the giving instrumental support and affect or symptom experience on the following day.

These findings demonstrate that emotional support-giving is linked to worse concurrent affective and physical states, but greater well-being in the day following the act of giving. Instrumental support, on the other hand, is associated with greater positive affect during the time of giving, but does not have lingering effects on a person's well-being on the following day. These findings further our understanding of potential pathways through which instrumental and emotional support giving is linked to psychological and physical well-being in daily life.

210) Abstract 1608

THE INFLUENCE OF ETHNICITY AND NATIONALITY ON CORTISOL REACTIVITY TO AN ACUTE LABORATORY STRESSOR, WITH AND WITHOUT PARTNER SUPPORT.

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The experience of stress can have a damaging impact on physical and mental health. Cortisol is a biomarker of psychological stress and a key product of the biological stress response. Support from a romantic partner has been shown to reduce biological stress reactivity through suppression of salivary cortisol levels in response to a stressor, buffering the negative impact of stress on health (Kirschbaum et al., 1995; Ditzen et al., 2008). Ethnic disparities in health exist, with increased rates of disease and poorer health outcomes for minority groups. Despite this, little is known about the influence that ethnicity may have on the physiological response to acute stressors or the effectiveness of partner support in response to a stressor. The aim of the current study was to identify whether ethnicity influences cortisol secretion in response to the Trier Social Stress Test (TSST), an acute laboratory stress task both with and without partner support, in two countries (USA, UK).

61 participants from the United States and 24 participants from the United Kingdom completed the TSST. Ethnicities varied with 49% White, 27% Black, 9% Hispanic, 7% Asian, and 7% of participants stating 'other'. The TSST was administered either with or without the element of partner support before the stressor, and salivary cortisol samples were collected at baseline, post-task, and 10, 25, and 40 minutes post-task.

Results indicated that nationality and ethnicity yielded a significant main effect for cortisol secretion with US Blacks showing blunted cortisol secretion across the TSST. Interaction effects for both variables were approaching significance when analysed with condition, with Black and US participants showing the most reduction in cortisol secretion when supported by a partner.

These findings are novel, indicating a significant difference in cortisol secretion among ethnicities, and across two nationalities, indicating that both ethnicity and nationality are significant predictors of cortisol reactivity to an acute stressor. The findings of this study may provide evidence for a biological mechanism for the ethnic disparities seen in negative health outcomes.

211) Abstract 1578

THE TEMPORAL RELATIONSHIPS BETWEEN STRESS AND GIVING AND RECEIVING SOCIAL SUPPORT

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Background. Receiving support can buffer individuals against stress, and experiencing stress can lead to support seeking. However, recent work has suggested that giving support might also have stress buffering effects, and thus it is possible that experiencing stress can cause people to reach out to provide support for others. While studies have examined the relationship between stress and social support in cross-sectional and experimental studies, we sought to examine these relationships using daily assessments of receiving support, giving support and stress perceptions.

Methods. 160 university students enrolled in a semester-long daily diary/EMA study. Each night during three separate weeks, participants

filled out a daily diary questionnaire in which they reported if they received or gave support that day (21 assessments). In four times a day EMA assessments, participants reported on their stress levels (we will compute average daily stress levels for each of those 21 days).

Analytic Plan. We will use multi-level modeling with time-lagged analyses to examine if previous day's stress was predictive of next day support behaviors (both receiving and giving support), controlling for previous day support behaviors. Similarly, we will run analyses entering receiving and giving support as predictors of next day stress, controlling for previous day stress. Finally, by putting both receiving and giving support into the same model, we can assess which support activity has a larger effect on reducing next day stress.

Hypotheses. Higher levels of previous day stress will lead to more days of participants reporting giving support to others, and more days of participants reporting receiving support from others. Furthermore, both giving and receiving support will predict lower levels of next day stress.

Implications. Here, we aim to look at these bidirectional relationships between support provision and receipt and stress to further disentangle the direct effects that occur naturally in young adults' daily lives. Knowing more about these relationships provides insight for future stress reduction interventions. Indeed, sometimes support groups are not effective for managing stress, but perhaps interventions that focus on providing support for others could have important implications for individuals experiencing significant stress.

Note: analyses will be done by March 6th.

212) Abstract 1420

PERCEIVED SOCIAL SUPPORT ON URINARY SODIUM LEVELS IN THOSE WITH HEART FAILURE

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Background

Social support predicts self-care outcomes in patients with heart failure (HF). Patients who report having more support from their family and friends tend to report managing their condition more successfully.[1] Social support may influence self-care adherence by influencing condition monitoring, maintenance, and management activities such as adherence to a low-salt diet.[1] However, although important, self-reported adherence is low (between 25-55%).[2345] Men are less adherent to a low-salt diet than women, possibly because men eat more food (and more grams of sodium).[6] The potential impact of social support on sodium levels in HF has not been examined using objective measures such as urinary sodium excretion. The aim of the current investigation was to examine whether perceived social support was associated with urinary sodium levels in HF. It was hypothesized that lower social support would be related to higher sodium levels. Given that married men may not be the primary purchaser and preparer of meals in the home, it was hypothesized that this relationship may be stronger for men.

Methods

Participants were 294 HF patients (59.9% male, 72.1% Caucasian) aged 68.7 (SD = 9.6). Perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS). Adherence to a low sodium diet was based on mean 24-hour urinary sodium values. The hypotheses were tested using hierarchical linear regression.

Results

Social support was negatively associated with urinary sodium output, $\beta = -.120$, $t(1, 297) = -2.08$, $p < .05$. However, when gender was used as a statistical covariate, social support was no longer associated with sodium output.

Conclusions

Perceived social support was not associated with lower sodium levels in the current sample after controlling for gender. Although the inclusion of gender in analyses reduced power and observed trends were not statistically significant, the effect sizes appeared small (< 2% of variability explained) suggesting that a clinically meaningful effect of perceived social support on sodium consumption was unlikely. Decreasing sodium consumption may require more than perceived social support, such as instrumental support like including the patient's family in following a low-sodium diet.[7]

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213) Abstract 1553

VISUALIZATION OF SOCIAL SUPPORT ALTERS MOOD: CLINICAL IMPLICATIONS OF A CONCEPTUAL MAPPING TOOL

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Background: Health benefits of social support are well documented across a wide range of populations, yet measurement does not always capture the complexity of this multi-faceted concept. The aim of the current study was to examine the effect that visualization of social support has on mood and factors that influence this effect, using a social mapping tool.

Methods: Sixty-two adult participants (53 female) aged 18-38 years (mean=21.16) were recruited for an on-line study. Participants completed a series of psychosocial well-being measures including underlying happiness, empathy, stress, anxiety, depression, and acute physical health symptoms. A visual perceived social support mapping tool (VSSM) was created to report the number and closeness of social contacts (friends, family, significant others). Immediately before and after completion of the VSSM, positive and negative mood was assessed.

Results: Mood state altered significantly from pre to post completion of the VSSM, showing a main effect of negative mood reduction (p=.005). Interaction effects of stress (p=.035) and happiness (p=.014) on positive mood were observed pre to post VSSM completion. Participants who reported higher happiness scores showed the greatest increases in positive mood pre to post VSSM completion, whilst those reporting higher levels of stress had greater reductions in positive mood pre to post completion of the VSSM. Calculations of perceived support number and closeness of contacts were not significantly associated with mood changes and social support did not moderate happiness or stress. Additionally, empathy (affective drive) was significantly related to support number and closeness (p=.011) but did not act as a moderator of support indices. There were no effects found for anxiety, depression or acute physical health symptoms with social support number or closeness.

Conclusions: Visualizing social support using the VSSM influences positive and negative mood, independently of perceived number and closeness of social contacts and these effects are related to underlying well-being indicators such as stress and happiness. The VSSM acted as a brief intervention that served to alter mood; findings indicate that manipulating stress and happiness levels prior to use may have the greatest benefit. The tool has significant potential for application in a clinical context.

214) Abstract 1228

BREASTFEEDING AS A PROTECTIVE FACTOR FOR DYSREGULATED POSTPARTUM BIOLOGICAL STRESS OUTCOMES IN LOW-INCOME MOTHERS AND THEIR INFANTS

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Breastfeeding has been shown to have beneficial health outcomes for mothers and their infants. However, less is known about the impact of

breastfeeding on biological markers of stress, such as alpha amylase and cortisol. In previous research, a ratio of alpha amylase over cortisol (AOC) has been significantly associated with measures of chronic stress; this ratio has been defined as an indicator of changes in alpha amylase after controlling for changes in cortisol. Yet, few studies have examined AOC in mother-infant dyads. The present study investigated whether greater maternal biological stress levels, measured by AOC, were associated with greater infant biological stress levels (AOC) and whether this association was attenuated with greater number of days breastfed, indicating the protective nature of breastfeeding on infant biological stress dysregulation. To test this hypothesis, 54 mother-infant dyads, who were part of a larger stress management study, collected in-home saliva samples over the course of one day at three months postpartum. Additionally, mothers self-reported the number of days they breastfed since birth. A multiple regression analysis showed that greater maternal AOC was associated with greater infant AOC, $b = .45$, $t(50) = 2.28$, $p = .03$. Furthermore, mothers who breastfed over a longer time period had infants with a lower AOC, $b = -.01$, $t(50) = 2.23$, $p = .03$. However, there was not a significant interaction between maternal AOC and breastfeeding on infant AOC. These findings support expanding empirical evidence on the benefits of breastfeeding on infant biological stress levels. Additional research investigating the long-term effects of maternal stress on infant outcomes and protective factors that may help ameliorate these effects is needed.

215) Abstract 1275

PSYCHONEUROLOGICAL SYMPTOMS IN CHRONICALLY STRESSED LOW-INCOME MOTHERS

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More than 10% of U.S. mothers live in poverty (U.S. Census Bureau, 2014). Exposure to the chronic stress of socioeconomic hardship is associated with higher reports of pain, fatigue, sleep disturbance, depressed mood, and cognitive dysfunction, known in nursing science as "psychoneurological symptoms." These symptoms can significantly impair maternal functioning, which in turn places children at higher lifetime risks of altered cognitive and emotional development (England, 2009). To date, symptom interventions in low-income mothers have focused on depressive symptoms alone, and intervention studies have found variable-- often limited-- efficacy. This variable efficacy indicates a gap in our knowledge of how to improve outcomes in this vulnerable population. Conceptualizing mothers' symptoms beyond depression to a set of stress-related psychoneurological symptoms adds consideration of chronic pain and other symptoms, opening the possibility for new intervention targets to improve outcomes for mothers and their children. This presentation will describe the psychoneurological symptoms in a sample of low-income mothers (N=356) and clarify associations of these symptoms with stress and with maternal/child outcomes. The study aim is to describe the association of the psychoneurological symptoms with maternal/child outcomes using reduced rank regression (RRR). Preliminary RRR models have revealed that two symptoms, chronic pain and depressed mood, account for 80% of the variation in mothers' function. Ongoing analyses, which will be completed prior to March 6, will include multiple regression models 1) to further explore how chronic stress is associated with intensity of psychoneurological symptoms and 2) to clarify the relationship of psychoneurological symptoms to mother's functional status (physical functioning, social functioning, role functioning, mothering) as well as child behavioral and developmental status. Already, the study results shed light on the pattern of symptoms experienced by low income mothers, thus identifying pain as an additional symptom target in interventions for this important, vulnerable group.

216) Abstract 1219

LOWER SUBJECTIVE SOCIAL STATUS IS ASSOCIATED WITH POORER BLOOD PRESSURE RECOVERY TO ACUTE PSYCHOLOGICAL STRESS

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Background. Lower subjective social status (SSS) is negatively related to self-rated health and biological risk factors for cardiovascular disease, even after adjusting for objective measures of socioeconomic status such as education and income. Relatively greater cortisol and interleukin-6 responses to social evaluative threat (e.g., Trier Social Stress Test; TSST) have been observed to increase among those who rate themselves low in SSS. However, no known study has examined whether self-reported SSS is associated with cardiovascular responses to stress. Therefore, it was hypothesized that lower SSS would be associated with exaggerated cardiovascular responses to and poorer recovery from acute stress.

Methods. We assessed 49 healthy adults (mean age = 20.80; SD = 3.48), most of whom were female (73.5%; n = 36) and Black (89.8%; n = 44). The MacArthur Social Ladder was used to assess SSS within one's community and within one's country. Participants completed a version of the Trier Social Stress Test which included a 20-minute baseline, 10-minute speech preparation on why the participants would be a good candidate for their ideal job, 5-minute speech delivery, 5-minute mental arithmetic, and 20-minute recovery. Averages of systolic (SBP) and diastolic blood pressure (DBP) and heart rate (HR) were taken across the last 10 minutes of baseline and each minute during subsequent periods. Change scores for HR, SBP, and DBP were calculated as differences between baseline and speech preparation, speech delivery, math, and recovery.

Results. SSS within one's community and within one's country were negatively associated with SBP recovery change scores, $rs = -.36$, $p = .02$, and marginally, negatively associated with DBP recovery change scores, $r = -.27$, $p = .08$. All other correlations were nonsignificant. However, correlations between both SSS variables and SBP change scores were negative.

Conclusions. The results of this study suggest that those with lower SSS had less complete blood pressure recovery from acute psychological stress than those with higher SSS, regardless of whether SSS was within the context of one's community or one's country. Such responses to stressors adds another possible link between SSS and cardiovascular health. More robust analyses are needed to corroborate these findings.

217) Abstract 1223

THE ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND CORTISOL PATTERNS IN LOW-INCOME, ETHNIC-MINORITY MOTHERS

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Physical activity has been linked to positive health outcomes such as reduced all-cause mortality risk, cardiovascular disease risk, depression and anxiety symptoms. During parenthood, mothers can experience increased levels of stress and are also less likely to engage in physical activity compared to other populations. Previous research indicates that physical activity may regulate cortisol patterns, yet, little research has been focused on mothers. The current pilot study aims to examined whether different measures of physical activity (self-report, Fitbit, fitness test) were associated with cortisol patterns (diurnal slope, area under the curve, awakening response) among 30 low-income, ethnic-minority mothers (57% average income <$20,000; 53% Latina). The majority of our sample were sedentary with only 3% of mothers meeting the national recommendations of daily aerobic activity (30 minutes or more of moderate to vigorous aerobic activity).

Physical activity was measured by a participant self-report of their activity over three days (assessed for average daily minutes of moderate-intensity activity), while wearing a Fitbit accelerometer during that time period (assessed for average daily minutes of 'very active' activity). In addition, mothers participated in a physical fitness test that assessed their time to complete one mile and their flexibility. During the three-day assessment period, mothers also collected their saliva at four times on one collection day (upon waking time, 30 minutes after awakening, 4pm, and 8pm) to assess for cortisol patterns. Results showed that mothers who reported engaging in greater minutes of physical activity had a significantly flatter diurnal slope throughout the day (p = .045). Furthermore, greater 'very active' minutes, assessed by the Fitbit, was associated with a higher cortisol awakening responses (p = .05). Finally, a trend was found such that mothers who were more flexible had lower cortisol levels (AUC; p = .078). Results suggest that the association between physical activity and cortisol differ by the type of physical activity measurement conducted among low-income, ethnic-minority mothers and have methodological implications for future physical activity studies in this population.

218) Abstract 1554

PARENTING STYLE MEDIATES THE ASSOCIATION BETWEEN LOWER CHILDHOOD FAMILY INCOME AND HIGHER BLOOD PRESSURE IN 10-YEAR OLD GIRLS

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Background: There has been extensive research on the impact of socieconomic status (SES) on cardiovascular health in adults for over 40 years, but interest in the effects of SES on child health is more recent. Despite knowledge that childhood SES is a potent predictor of cardiovascular health later in life, how this happens is unclear. One possible pathway involves relationships to parenting and the psychosocial home environment.

Aim: To examine whether parenting style mediates the association between early life SES and childhood blood pressure.

Methods: Data from 192 10-year old boys (n= 95) and girls (n=97) enrolled in the ongoing Quebec Longitudinal Study of Child Development were examined. The children were enrolled at age 5 months and had repeated home visit assessments at 5, 30, and 48 months and annually thereafter. SES was determined using self-reported family income. At 30 months, maternal Responsivity was assessed using the Home Observation for Measurement of the Environment, and Harsh Parenting using the self-report Parental Cognition and Conduct Toward the Infant Scales. Resting blood pressure was measured in the home during the 10-year assessment. Statistical analyses examined the indirect effect of family income on blood pressure as mediated by parenting style.

Results: The first analyses examined correlations between family income at age five months and 10-year old SBP and DBP. There was a significant correlation between family income and SBP in girls, r = -.23, p = .03, but not for boys; thus, subsequent analyses focused on the association between early family income and age 10 SBP in girls. Among girls, five-month family income was significantly positively associated with maternal Responsivity, r = .40, p < .001, and negatively associated with Harsh Parenting, r =-.24, p = .026, and Responsivity was associated with SBP, r = -.23, p = .031. Subsequent mediation analyses showed that five-month family income was linked indirectly with SBP at age 10 through its effect on maternal Responsivity, b = -0.37, 95% CI = -0.99, -0.01, but not through Harsh Parenting.

Conclusion: Early childhood family income was linked with more favorable parenting styles at 30-months old and lower SBP at 10 years old in girls. In particular, a more active and reponsive maternal parenting style significantly mediated the association between 5-month family income and SBP.

219) Abstract 1584

SUBJECTIVE SLEEP QUALITY FOLLOWING SPOUSAL BEREAVEMENT IS ASSOCIATED WITH DEPRESSION, NOT GRIEF SEVERITY

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Background: A small yet substantial literature on the impact of bereavement on sleep suggests that both severe grief and depression following loss negatively affect sleep quality, using both objective (e.g. EEG) and subjective (e.g. PSQI) measures. There is also evidence that higher depression and higher grief severity interact to predict lower sleep quality. The current study aimed to clarify these relationships in a group of widow(er)s by examining the association of grief severity, depression, and their interaction with subjective sleep quality.

Methods: One hundred widow(er)s (*M*age = 67.5, *SD* = 8.8) completed self-report measures at baseline of a randomized controlled trial of a mindfulness training intervention for grief. The mean time since loss was 14.7 months. Measures included demographic variables, grief severity (ICG-R), depression (CES-D), and three subscales of sleep quality from the PSQI: Sleep Efficiency (SE), Perceived Sleep Quality (PSQ), and Daily Disturbances (DD). Regression models were conducted to test the hypothesis that higher grief severity and higher depression interact to predict lower SE and PSQ and higher DD. Correlation analyses of relevant covariates and outcome variables determined inclusion in regression models.

Results: Grief severity and the interaction of grief severity and depression were not associated with any measures of subjective sleep quality. Controlling for relevant covariates, higher levels of depression predicted worse SE (b = .047, p < .001), worse PSQ (b = .037, p < .001), and more DD (b = .023, p < .001). Though correlation analyses revealed a significant relationship between grief severity and depression, variance inflation factor values do not indicate collinearity that would result in biased models.

Conclusion: These results suggest bereavement-related grief is not associated with subjective sleep quality above and beyond the effect of depression symptoms in widow(er)s who suffered bereavement an average of 15 months ago. Bereavement-related grief and depression are correlated yet distinct constructs. Most research has shown that higher grief severity is associated with lower sleep quality, especially early in widowhood. Results of the current study suggest depression predicts lower sleep quality later in widowhood, in line with sleep disturbance as a symptom of depression.

220) Abstract 1823

CPAP POSITIVELY IMPACTS AORTIC HEMODYNAMICS NOCTURNAL VARIABILITY IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA

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Objective: Obstructive Sleep Apnea (OSA), a common sleep disorder affecting 22 million people in the United States, is characterized by repeated episodes of arousal and hypoxemia adversely affecting cardiovascular function. Although the link between cardiovascular dysfunction and OSA has been highlighted recently, the impact of continuous positive airway pressure (CPAP) during sleep on aortic hemodynamics and arterial stiffness have been poorly explored. Accordingly, we aimed to explore the impact of CPAP during sleep on non-invasive hemodynamics (augmentation index [AIX], aortic systolic blood pressure [aSBP] and arterial stiffness (pulse wave velocity [PWV]) in a patients with OSA.

Method: Using a crossover design, the tensionMed Arteriograph device it's being used to measure cardiovascular parameters in consecutive nights (one with and one without CPAP use). Patients with OSA are being recruited in this ongoing study. The

measurements are being taken every 20 minutes all throughout the night for both aortic hemodynamics and arterial stiffness.
Results: Preliminary results suggest that AIX, aSBP and PWV are lower with the use of CPAP compared with the non CPAP night. Interestingly, the variability of the cardiovascular parameters seem to increase with the use of CPAP suggesting improvement on cardiovascular functioning.
Conclusion: Overall, preliminary results seem to suggest a favorable outcome with CPAP use as evidenced by increased nocturnal variations in aortic hemodynamic parameters and decreased arterial stiffness. If our hypothesis holds true, CPAP could be used as a cardioprotective tool in patients with OSA. Prospective studies aimed at understanding the impact of CPAP on aortic hemodynamics and central cardiovascular parameters including coronary blood flow in patients with OSA are warranted.

221) Abstract 1098
ALTERNATION VIGIL / SLEEP AND DREAMS IN ADULTS QUESTIONNAIRE
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Backgrounds: Construction and validation of a Questionnaire on the evaluation of sleep/dream and vigil alternation in the construction of consciousness plasticity in adults, from the age of 18 years. Consciousness is the characteristic of the mind that allows one to travel in the mind of others and of oneself, continuing in reality. Plasticity is the ability to give new answers, learning from experience and exploring new opportunities (Corballis, 2014).
Methods: Elaboration of 6 hypothetical factorial structures by pre-test (N = 30) and definitive test (N = 676) with operational difficulties. Instrument divided into 2 parts. The first is a one-dimensional scale on sleep; the second is a multidimensional scale on dreams, vigil life, and mind-body health.
Answers in a Likert rating scale of 5 points. Scales and subscales defined by the factorial structure exhibit a suitable Cronbach's alpha. Part I and II item redundancy was inspected as well as the convergent-descending validity of the items.
The theoretical framework is based on the cognitive neuroscience theories of dream-sleep, as a state of primary consciousness, which reprograms in virtual and prepares the vigil consciousness. (Hobson, A. & Pace-Schott (2002). Hobson A. & Tranquillo N. (2014)).
Results: Validated the factorial structure of the questionnaire, representing the interactions between sleep, dream and wakefulness. Questionnaire in 4 scales. One on sleep habits and the transition between sleep and wakefulness, in the cultural context. The other two relate to the forms and emotions of dreams, future-oriented life projects, real interpersonal relationships, and the intentionality attributed to dreams. Sub-scales relating to hypnagogic periods, emotions, and life projects seem to better represent the interaction between the two states of consciousness. A fourth scale aims to correlate these dimensions with psychosomatic health.
The statistical syntheses defined a final questionnaire with 108 items, to be quoted directly, except for 38 of them.
Conclusions: Questionnaire needs replication with adult populations with psychopathology and on multiculturality.
Certain items in the questionnaire lack content analysis.

222) Abstract 1667
STRESS REACTIVITY DURING A PERIOD OF REAL-LIFE SUSTAINED STRESS: THE ROLE OF SLEEP AND ASTHMA
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Background: Prior research has linked poor sleep habits with increased psychological stress reactivity. Few studies, however, have examined the influence of sleep on stress reactivity during naturalistic periods of sustained acute stress. Understanding the extent to which individuals' sleep quality and duration influence their response to real-life stress is critical, given the prevalence of increased stress periods in individuals' lives. Additionally, increasing our knowledge of how chronic disease influences individuals' stress reactivity is of urgent need. Although prior research has associated increased stress with exacerbations in asthma symptoms, no prior research has examined the role of asthma in predicting the psychological response to real-life sustained stress. **Methods:** In the present study, a final exam period was used as a naturalistic period of sustained acute stress. Undergraduate students (99 with asthma, 487 without asthma) were participants. Students were assessed during an academic semester and final exam period. Participants completed self-report measures of demographics and health information, chronic and acute stress, sleep quality and duration. We anticipated that poor sleep quality and duration and greater levels of chronic stress would predict greater acute stress reactivity during the exam period. Additionally, we predicted that asthma status would interact with chronic stress, with asthma and greater chronic stress predicting greater increased stress reactivity. Multiple linear regression controlling for age, sex, race, body mass index, and day during the exam period was used to predict stress reactivity during exams. **Results:** Consistent with expectations, results indicate that shorter sleep duration and poor sleep quality during the exam period predicted greater stress reactivity during exams. Additionally, being female and completing the assessment during the beginning of the exam period were significant predictors of greater stress reactivity during exams. Chronic stress and the interaction between chronic stress and asthma were not significant predictors of stress reactivity. A diagnosis of asthma, however, predicted greater stress reactivity during exams. **Conclusion:** Results indicate that sleep quality and duration, in addition to asthma, are critical in predicting the psychological response to heightened real-life stress.

223) Abstract 1576
CHILDREN CO-SLEEPING WITH PETS EXHIBIT NO MORE SLEEP DISRUPTION THAN SOLITARY SLEEPERS
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BACKGROUND: Many people share their bed with pets. Despite high prevalence rates of co-sleeping (30-50%) in children and adults, few studies have examined the impact of pets on sleep. Pets are often thought to impair sleep due to noise or nocturnal activity, but evidence is limited. Sleeping with pets may be beneficial to some. Pet owners have strong social bonds with their pets and perceive sleeping with pets as calming and comforting. The study aim was to investigate the influence of co-sleeping with pets on children's sleep.
METHOD: Children aged 9 to 17 years (*N*= 244; *M*=12.6 yr; 43.4% female) participated in the larger Healthy Heart Project in Montreal. Children answered a single item about co-sleeping with pets ("I share my bed with my pets"). Children and parents answered questions about sleep duration, difficulty falling asleep, sleep quality, sleep disturbances, and sleep hygiene. Sleep was assessed using wrist-actigraphy over two weeks. Children completed a single-night home sleep study using polysomnography (PSG), scored by a certified sleep technician.
RESULTS: Three groups were identified based on frequency of sharing bed with pet: *never* (n=123, 65.4%), *once in a while* to *sometimes* (n=31, 16.5%), or *quite often* to *always* (n=34, 18.1%). Analyses controlled for allergies, asthma, and sleeping arrangement (alone, with other). Children who always shared a bed with their pets had sleep profiles similar to those who never or occasionally slept with pets. For reported measures, no significant differences were observed between groups: sleep quality (d_{avg}=.28), difficulty sleeping (d_{avg}=.35), awakenings (d_{avg}=.21). For actigraphy, groups did not differ: duration (d_{avg}=.21), WASO (d_{avg}=.17), awakenings (d_{avg}=.11), onset latency (d_{avg}=.13). For PSG, there were no group differences: total sleep time (d_{avg}=.24), percentage of time spent in each sleep stage (d_{avg}=.10-.21), onset latency (d_{avg}=.20), WASO (d_{avg}=.17), awakenings (d_{avg}=.11).
CONCLUSION: Co-sleeping or sharing a bed with a pet was no more disruptive than solitary sleeping. Sleep duration, time to fall asleep, awakenings, and sleep quality did not differ among children who

shared their bed with a pet or slept alone. Future research should consider methodological issues related to measuring dyadic sleep, as well as the role of psychosocial factors (e.g., attachment, anxiety, social support).

224) Abstract 1158

WHY ARE DEPRESSIVE SYMPTOMS RELATED TO POOR SLEEP HEALTH? EXAMINING PATHWAYS IN THE STUDY OF WOMENS HEALTH ACROSS THE NATION (SWAN) SLEEP STUDY

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Introduction: Consistent evidence has demonstrated that depressive symptoms are associated with sleep disturbances in midlife women, and both are related to greater risk for cardiovascular disease and mortality. However, the mechanisms underlying the associations have not been elucidated. Here, we evaluate body mass index and physical activity as possible mediators of the association between greater depressive symptoms and poorer sleep health, a multidimensional construct.

Measures: 332 midlife women from the Study of Women's Health Across the Nation (SWAN) were assessed for depressive symptoms on the Center for Epidemiologic Studies Depression Scale body mass index was determined by study staff, and self-reported physical activity on the Kaiser Physical Activity Scale at 6-9 annual assessments. Variables' values were averaged across visits. During the SWAN Sleep Study occurring 6 months later, sleep efficiency, duration midpoint (timing), and standard deviation of midpoint (regularity) were averaged across days of wrist actigraphy (M = 25.8); alertness and sleep satisfaction were assessed via self-report. Each component was dichotomized based on empirical evidence, and the six components were summed; higher values indicated better sleep health. A parallel mediation model was used to examine the hypothesis that body mass index and physical activity mediated the association between depressive symptoms and sleep health.

Results: Higher depressive symptoms was associated with greater body mass index (=0.18, 95% CI [0.08-0.28]) and lower physical activity (β=-0.20, 95% CI [-0.30, -0.10]). Body mass index (β=-0.17, 95% CI [-0.28, -0.07]), but not physical activity (β=0.10, 95% CI [-0.02, 0.20]), was associated with sleep health. There was a significant indirect effect of depressive symptoms on sleep health through BMI (β=-0.03, 95% CI [-0.07, -0.01]), but not through physical activity (β=-0.02, 95% CI [-0.05, 0.01]). The direct effect of depressive symptoms on sleep health accounting for these indirect effects was significant (β=-0.17, 95% CI [-0.28, -0.03]), supporting partial mediation.

Discussion: Greater body mass index may partially explain why higher depressive symptoms are related to sleep disturbances. Future work should continue to evaluate possible mechanisms (e.g., inflammation) to further explain the association between depression and sleep health.

225) Abstract 1663

LANGUAGE ABILITIES MAY MEDIATE RELATIONSHIP BETWEEN HABITUAL SLEEP, SLEEPINESS AND ACADEMIC PERFORMANCE

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It is no secret than many college students get sub-optimal sleep (Buboltz, 2001). This is problematic since past research has found that sleep has far-reaching cognitive, emotional, physical and educational implications for students (Lund, 2010; Gaultney, 2010). Sleepiness has been linked to students' academic success (Shin et al., 2003; Curcio at al., 2006), and it has been proposed that alertness (Kamdar et al., 2004), overall cognitive function (Alapin et al., 2000), and learning and memory (Smith, 2001) underlie this relationship. However, a rapidly growing literature points to the relationship between sleep and language and reading (Gómez, 2011; Smith et al, 2018), which are strong predictors of academic performance (Carney & Geis, 1981). The current study explores the extent to which language skills mediate the relationship between habitual sleep, sleepiness, and academic performance in college students.

To this end, a cohort of college students completed standardized measures to capture language and reading abilities, non-linguistic cognitive performance, and academic performance. Students also complete experimental measures of attention, declarative learning and procedural memory. To measure habitual sleep and sleepiness characteristics, students complete the Pittsburgh Sleep Quality Index (PSQI, Buysse et al., 1989) and the Epworth Sleepiness Scale (ESS, Johns, 1991). While we are still collecting a sufficient sample for our mediation analysis, preliminary correlations conducted on a dataset of 41 participants aged 18-33 (*M*= 21.29, *SD*= 2.64; 8 male) reveal associations between daytime sleepiness and word reading (p=.03), rapid automatized naming (p= .02), and trending relationships between daytime sleepiness and spoken language processing(p= .10) and word reading efficiency (p=.07). In addition, split-half comparison between those with good and poor sleep reveal a trending difference in declarative learning ability (p= 0.1), and comparable procedural learning performance.

These initial correlations suggest a potential relationship between sleep and language, reading, and declarative learning abilities. With our planned analyses, we will investigate the possibility that academic performance may not only be impacted by day-to-day changes in function, but also language and reading capacities, which can be altered by sleep characteristics.

226) Abstract 1690

SUBJECTIVE SLEEP QUALITY IS ASSOCIATED WITH ACCULTURATIVE STRESS, DEPRESSIVE SYMPTOMS, AND PTSD-RELATED SYMPTOMS AMONG EAST AFRICAN IMMIGRANTS

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African Americans are disproportionately impacted by chronic diseases in the United States. To reduce this disparity, recent research has focused on subgroups within this population. This is particularly beneficial to East African immigrants because their cultural background, life course, and life style tend to differ from African Americans who were born and raised in the U.S. or Africans who migrated from different parts of the world. Immigrants in general undergo acculturation, a complex psychological adaptation after migrating to a new country, which could be stressful. Sleep is an important determinant of health and the development of chronic diseases. Many immigrants from East Africa experienced multiple stressful life events prior to migration. Sleep quality may be a mediating factor. Whether pre- and post-migration stress exposure is associated with subjective sleep quality has not been directly examined among East African communities. In this cross-sectional study, 405 East African women and men (mean age = 46.8, SD = 20.9) were asked to complete questionnaires regarding demographics, acculturative stress, negative affect, and symptoms related to post-traumatic stress disorder (PTSD), and substance use. Subjective sleep quality was assessed by Pittsburgh Sleep Quality Index (PSQI; Buysse et al 1989). Results indicated that the mean and median of PSQI total of our sample was 5.8 and 5, respectively. Bivariate correlations and chi-square tests found that female sex and older age were related to impaired sleep quality (higher PSQI total scores). Also, greater levels of acculturative stress (stress due to language skills and intercultural relationships), depressive symptoms, and PTSD-related symptoms were linked to sleep problems. Multiple regression models controlling for demographic variables found that depressive symptoms and PTSD-related symptoms independently predicted PSQI. While PSQI was not associated with tobacco, khat, or alcohol use status, greater PSQI was related to longer duration (years) of khat use. This study provides

initial evidence linking subjective sleep quality, stress exposure, negative affect, and substance use among individuals from East African communities.

227) Abstract 1368

AUTISM TENDENCY OF PATIENTS WITH SUSPECTED HYPERSOMNIA

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Background & Aim:It's known that some people with developmental disorders have some problems in sleep-wake rhythm. Not a few young people visit sleep clinic because of school absenteeism with difficulty waking-up or because of excessive daytime sleepiness. Through medical interviews and examination, it sometimes becomes clear that some of them have development disorders. In this cross-sectional study, we examined how often patients with suspected hypersomnia have autism tendency.

Methods: The subjects complained difficulty waking-up or excessive daytime sleepiness and were asked to answer self-completed questionnaires including Autism-Spectrum Quotient (AQ), Epworth sleepiness scale (ESS), Pittsburgh sleep quality index (PSQI) and the Self-rating depression scale (SDS) and they underwent diagnostic overnight polysomnography (PSG) and the multiple sleep latency test (MSLT). We analyzed the relationship between these questionnaires and the findings of sleep diary, PSG and MSLT among the subjects (54 men and 53 women, 12-29 years), excluding cases with sleep apnea, bipolar disorder, major depressive disorder and schizophrenia spectrum disorder.

Results: Among the subjects, 7 (7%) patients showed 33 or more AQ score; 3 (6%) out of 50 cases with 8 min. or less mean sleep latency (MSL), 0 out of 9 cases with 8 min. or less MSL and 2 or more sleep-onset REM period, in cases with 10 or more sleeping hour, 2 (6%) out of cases with delayed sleep-phase pattern, 0 out of 8 cases with non-24-hour sleep-wake pattern, 0 out of 17 cases with 2 or more difference between weekday and weekend sleeping hours. AQ score revealed positive correlations with SDS score ($r=.41$, $p<0.0001$) and PSQI score ($r=0.20$, $p<0.05$). Arousal index of the subjects with 33 or more AQ score was higher than those with less 33 AQ score (24.0, 14.9, respectively, $p<0.05$).

Conclusion: In the subjects with difficulty waking-up or excessive daytime sleepiness who underwent PSG and MSLT, 7 % of these patients showed autism tendency. It is important to consider the possibility of patients having autism in medical practice.

228) Abstract 1062

LONGITUDINAL ASSOCIATIONS BETWEEN SLEEP PROBLEMS AND MORTALITY IN ACUTE CORONARY SYNDROME

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Objectives: The effects of sleep disturbance and its treatment on the prognosis of patients with acute coronary syndrome (ACS) are not well understood. In this study, we investigated the impact of sleep disturbance on long-term all-cause mortality according to depression comorbidity and treatment in ACS patients.

Methods: A cross-sectional baseline study and a nested 24-week double-blind escitalopram-placebo controlled trial were carried out from May 2007 to March 2013, and then 5~12 year follow-up for all-cause mortality was conducted. A total of 1,152 patients with ACS were stratified by baseline depression comorbidity and treatment allocation into four groups: 706 no depression, 149 depression on escitalopram, 151 depression on placebo, and 146 depression on medical care as usual (CAU). Sleep disturbance was evaluated by the Leeds Sleep Evaluation Questionnaire. During the 5~12-year follow-up, Kaplan Meyer event rates for all-cause mortality were calculated, and hazard ratios (HRs) using Cox regression models were estimated after adjustment for a range of covariates.

Results: Worse sleep states at baseline increased long-term all-cause mortality in all patients (HRs 1.08~1.59). The association between worse sleep states and long-term all-cause mortality was mostly significant, both in patients without depression and in depressed patients who received CAU, but not in depressed patients who participated in the 24-week trial.

Conclusions: Routine evaluations of sleep disturbance in ACS and further treatment allocation may contribute to reducing long-term mortality associated with the disease.

229) Abstract 1700

SLEEP DEPRIVATION AND PHYSIOLOGY IN ROMANTIC COUPLES

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Sleep is a necessary biological process that contributes to emotion regulation, cognitive functioning, and physical health. In particular, reduced sleep duration has been associated with increased blood pressure and sympathetic nervous system activity, both of which could contribute to hypertension, coronary heart disease, and diabetes. In recently completed study of 101 cohabitating couples (N=202), we examine the effects of sleep deprivation on physiologic responses related to health. One partner in half of the couples was randomly assigned to sleep 50% of his or her normal sleep for two nights before coming into the lab. During the lab session, couples completed a variety of positive and negative social interaction tasks, including a socioevaluative stressor, while physiologic responses were obtained. We examined how physiologic responses, like heart rate variability (RSA) and blood pressure, are influenced directly by sleep deprivation but also indirectly by examining physiologic responses of people whose partners were sleep deprived. This research adds to current literature by exploring how sleep loss affects physiological measures associated with adverse medical consequences in the social context that sleep often occurs within romantic relationships.

230) Abstract 1651

EFFECTS OF EXERCISE AND DIET ON PHYSIOLOGICAL AND PSYCHOLOGICAL HEALTH

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Exercise and nutrition play a crucial role in overall physical health. However, less is known about how these health behaviors influence how we feel and perceive stressful situations. In a recently completed study of healthy adults (N=118), we examined the influence of physical activity and eating habits on psychological and physiological well-being and stress response. We used self-report measures of exercise and diet tendencies to explore their relationships with affect and physiology, both at baseline and during a socioevaluative stressor. We tested (1) how health behaviors relate to general affect before coming into the lab, (2) whether these health behaviors correlated to baseline physiologic measures, and (3) how health behaviors impact psychological and physiological response to acute stress. Preliminary analyses of the data suggest that more weekly minutes of exercise (including walking) is correlated with reports of less general feelings of worry and tiredness. No effect of exercise or diet was found on physiologic measures at baseline or in response to stress. This research adds to the current understanding about how diet and exercise impact physical health not only directly, but through psychological mechanisms as well.

231) Abstract 1479

PSYCHOSOCIAL RESOURCES AND HEALTH BEHAVIORS ACROSS RACIAL/ETHNIC GROUPS

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Introduction: While previous research has established a link between psychosocial resources and health behaviors, most of the studies focus on a single type of health behavior or use a sample restricted to Black and White populations. It remains unclear how psychosocial resources relate to a combination of healthy behaviors across different racial/ethnic groups. **Methods:** Data were drawn from the Chicago Community Adult Health Study, a sample of 3,046 Black, native-born Hispanic, foreign-born Hispanic, and White adults aged 18 years and over. Multiple binomial logistic regression analyses were conducted to examine associations between psychosocial resources (i.e., self-esteem, optimism, perceived mastery, social network, perceived availability of social support, and religious involvement) and a composite healthy behavior index across racial/ethnic groups. We repeated models with interaction terms to test for effect modification by race/ethnicity. **Results:** Higher levels of optimism (OR=1.05, 95% CI=1.01,1.08), self-esteem (OR=1.06, 95% CI=1.02,1.10), religious involvement (OR=1.05, 95% CI=1.01,1.09), and informal social integration (OR=1.04, 95% CI=1.00,1.07) were associated with greater odds of adherence to five healthy behaviors. We did not observe any racial differences in the relationship between psychosocial resources and the healthy behavior index. **Conclusion:** Certain forms of psychosocial resources are associated with health behaviors and the associations were broadly consistent across all racial/ethnicity groups. Improving psychosocial resources might be one pathway to support healthy behaviors and improve health.

232) Abstract 1400

EXPOSURE TO ATTACHMENT FIGURE CUES REDUCES CIGARETTE CRAVING

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Background: Cue-induced craving among smokers, brought on by exposure to smoking-related stimuli, is a well-documented phenomenon. Conditioning theory is most often used to explain how stimuli associated with smoking come to independently elicit craving to smoke. However, attachment theory may explain additional influences on cue-induced craving.

Methods: This study tested the effects of exposure to standard in vivo cigarette cues and to photographic attachment figure cues (i.e. digital photo of people identified as personal attachment figures) on smokers' craving and affect. Cue-reactivity as function of cue type was also examined to explore the magnitude of craving effect sizes for each cue type.

Results: Thirty-eight smokers (29 male, 9 female) were exposed to in vivo cigarette cues (i.e cigarette) and photographic attachment figure cues. Baseline to post-exposure differences in craving to smoke and affect were assessed. Sixty-one percent of participants reported increased craving to cigarette cues (m = 61.1 [SD 29.4]) compared to neutral cues (m = 46.6 [SD 28.8]), t(37)= 3.99, p<.001). When exposed to an attachment figure photo, 56% of participants reported decreased craving (m = 38.2 [SD 31.6]) compared to a neutral photo (m= 50.9 [SD 29.8]), t(35)= -2.661, p=0.01). The effect sizes for cigarette cues (d=.50) and attachment figure photos (d=.42) were similarly large. Participants' responses to photographic cues were not influenced by their reactivity to cigarette cues or by an attachment figure's smoking status.

Conclusion: These results offer further support for the influence of people cues on cigarette craving, and advance past work by specifically showing the inhibitory effect of attachment figures on craving to smoke.

233) Abstract 1459

EVALUATING THE IMPLEMENTATION OF AN EFFICACIOUS HIV INTERVENTION PROGRAM FOR HAZARDOUS DRINKERS IN CARE CLINIC CENTERS IN NYC

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Background: Antiretroviral therapy (ART) has become the medical standard of care for HIV-positive individuals in improving viral suppression. Alcohol and drug use have a negative impact on ART adherence. The Positive Living through Understanding and Support (PLUS) program has demonstrated efficacy to improve medication adherence and reduce alcohol consumption. The goal of the current study was to examine suitability, feasibility and acceptability of implementation in an NYC-based clinic setting as part of an effectiveness trial.

Method: We examined field notes from face-to-face qualitative interviews conducted during pre-trial implementation planning. Participants included stakeholders at three levels. 1) Mental Health Providers (n = 12) who are psychiatrists, psychologists, and psychiatric nurse practitioners. 2) Administrative Staff (n = 8) who oversaw programs and clinic operations. 3) Non-Clinicians (n = 11) who work with medical staff to help encourage self-management in HIV care.

Results: The implementation themes that emerged included: (1) *HighSuitability*: mental health providers saw drugs as at least equally relevant to medication adherence as drinking, and the intervention was expanded to include a focus on drug use; stakeholders viewed the program's focus on achieving viral suppression for patients that use substances as relevant to their clinic population; (2) *High Feasibility*: the program was perceived as well-matched to the skillset of clinic providers, who were exclusively mental health professionals with advanced graduate training and substantial experience delivering behavioral intervention services to the HIV positive population; and (3) *Acceptability*: the intervention was shortened to six 45-minute sessions to enhance acceptability.

Conclusions: Consistent with the suitability, feasibility, and acceptability framework, the findings from this formative evaluation indicated that PLUS program could be implemented into the care clinics utilizing experienced mental health care providers for intervention delivery, laying the foundation for an effectiveness – implementation trial.

Implications: This study provides a model for utilizing qualitative methodology to simultaneously build collaborative relationships between organizations and gather data necessary to inform the subsequent stages of effectiveness trials.

234) Abstract 1090

CLINICAL IMPLICATIONS OF HEART RATE VARIABILITY CHANGE FROM REST TO RELAXATION AND PACED BREATHING EXERCISES FOR OBESE ADULTS WITH LOSS OF CONTROL EATING

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Background: Heart rate variability (HRV) is a physiological marker of stress response and an indicator of emotion regulation capacity. Lower HRV is associated with depression, anxiety, and stress, but few studies have examined HRV in a population particularly vulnerable to emotional dysregulation: adults with loss of control (LOC) eating. HRV biofeedback training using paced breathing has shown increases in positive mood in non-clinical samples. Given the role of emotion regulation in the development and maintenance of disordered eating, HRV may be an intervention target. The current study (1) examined changes in HRV from rest to self-relaxation and paced breathing conditions, and (2) examined BMI and disordered eating severity as predictors of HRV change, in an adult sample with LOC eating.

Methods: 24 obese adults from the community (19 female; M_{BMI}=38.42 kg/m^2, *SD*=5.45) reported number of overeating episodes and LOC eating episodes in the past four weeks. Frequency-domain HRV variables were measured under three conditions reported here: rest, self-relaxation, and paced breathing (6 breaths/minute). HRV variables including low frequency in normalized units (norm) (LF), high frequency norm (HF), and the ratio between LF and HF (LF/HF) were used in analyses. Power in the LF range is thought to reflect both sympathetic nervous system (SNS) and parasympathetic nervous system (PNS) activation, HF reflects PNS activation, thus LF/HF reflects the SNS/PNS balance. Repeated measures ANOVA were used to examine changes in HRV from rest to other conditions and linear regression analyses were used to examine predictors of HRV change.

Results: There were no statistically significant changes in HRV from rest to self-relaxation. From rest to paced breathing, LF and LF/HF increased, and HF decreased, similar to findings in non-clinical samples. Only BMI significantly predicted change in HRV from rest to paced breathing, such that greater BMI was related to greater increase in LF/HF.

Conclusions: Non-significant HRV changes between rest and self-relaxation suggest the latter condition did not impact physiological functioning. Significant HRV change from rest to paced breathing, especially for those with higher BMI, suggests that paced breathing training, which heightens attention to physical sensations, may enhance emotion awareness and regulation, thereby reducing LOC eating.

235) Abstract 1026

THE PREVALENCE AND PSYCHOSOCIAL CORRELATES OF SUPPLEMENT USE IN NURSES

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The prevalence of dietary supplement use is increasing in the U.S., partly due to the diversification of supplements available, changes in government policies and dietary guidelines, increased scientific research, and enhanced marketing strategies. Studies have shown that over half of U.S. adults use vitamin/mineral supplements. Characteristics associated with supplement use in the general population include: being a woman, older age, presence of a diagnosed medical condition, higher education levels, a healthier diet, and other complementary and alternative medicine use. The prevalence of supplement use may be even higher in medical professionals, due to their attention on health. The goal of this study was to determine the prevalence and psychosocial correlates of supplement use in a sample of nurses. Participants were 461 nurses ages 18-65 (M age = 39.03 ± 11.07; 91% female) recruited from two hospitals as part of a larger study on sleep and vaccine response. Participants completed surveys to assess demographics, mental and physical health, stress, and personality. Two-hundred and forty-four nurses (54.1%) reported using at least one type of supplement. Those who used supplements were less likely to smoke (p = 0.02), but more likely to have a medical condition (p = 0.03) and had a greater average number of medical conditions than those who did not use supplements (p = 0.01). Only 8.6% of nurses using supplements met clinical criteria for anxiety and 5.3% for depression, but these frequencies were not statistically different than those observed in nurses who did not use supplements (anxiety p = 0.74, depression p = 0.29). There were no mean differences in conscientiousness, neuroticism, insomnia symptoms, alcohol consumption, or perceived stress in nurses who used supplements vs. those who did not. (Additional data on inflammatory biomarkers and specific supplements are in the process of being analyzed and cleaned, and these findings will be presented at the conference.) These results suggest that nurses report rates of supplement use similar to rates observed in the general population. Assessing the epidemiological correlates of supplement use in nurses may inform gaps in training, common misconceptions, or resistance to complementary and alternative medicine approaches, which may in turn affect the treatments that nurses recommend to their own patients.

236) Abstract 1262

MINDFULNESS AND FOOD SUSCEPTIBILITY: AWARENESS, ACCEPTANCE, AND CHANGE OVER TIME

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Background: Susceptibility to food cues may be related to the key constructs that comprise mindfulness. Specifically, mindfulness is both (a) awareness and (b) acceptance of internal and external experiences, including response to food. Food susceptibility (FS) has been evaluated in the context of mindfulness-based weight loss interventions but has not been directly compared to general (non-food related) mindfulness or its two components. The current study sought to determine 1) whether FS is associated with overall levels of mindfulness and its two subscales, and 2) to observe the effect of a mindfulness-based (MBT) behavioral weight loss (BWL) treatment on change in FS. **Methods:** 108 overweight/obese adults participating in a weight loss trial (Identifier: NCT02786238) participated in the study. The sample was 46±11 years old, 72% female, and 76% White. Participants were randomly assigned to MBT or a control arm. Measures were collected at baseline and post-treatment assessments. Mindfulness was measured with the Philadelphia Mindfulness Scale (PHMS) and its two subscales: Awareness and Acceptance. FS was measured with the Power of Food Scale (PFS). Covariates included age, sex, race, and education; percent weight loss was included as an additional covariate in post-treatment analyses. **Results:** Regression analyses revealed that PHMS scores were negatively associated with PFS scores (β=-.218, p=.031). Subscale analyses revealed that Acceptance was associated with PFS scores, such that greater acceptance was related to less FS (β=-.334, p=.002). However, Awareness showed no relationship with PFS scores (β=-.014, p=.890). Further, a 2(treatment)x2(time) repeated measures ANCOVA revealed a significant interaction between treatment and time (F(1,63)=4.195, p = .045), such that PFS scores showed a greater decrease from baseline to post-treatment in the ABT group (M_0=61.9±3.0, M_1=48.0±2.6) than in the controls (M_0=54.5±2.8, M_1=47.7±2.4). The main effects of time (F(1,63)=2.010, p=.161) and treatment (F(1,63)=1.281, p=.262) were not significant. **Conclusions**: Greater levels of mindful acceptance, but not mindful awareness, were associated with lower susceptibility to food. Further, mindfulness-based treatment produced greater decreases in food susceptibility than standard treatment, after controlling for weight loss.

237) Abstract 1723

ASSOCIATIONS BETWEEN LIFETIME STRESS EXPOSURE AND PRENATAL HEALTH BEHAVIORS

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Background: Prenatal health behaviors are important factors that protect against or increase risk of poor pregnancy health and negative birth outcomes. Life stress exposure increases the likelihood that mothers will engage in negative health behavior patterns that can in turn substantially impact birth outcomes and newborn health. However, no studies have examined how lifetime stress exposure is associated with prenatal negative and positive health behaviors.

Method: To address this issue, the present study examined how acute and chronic stressors occurring across the entire life course are associated with negative and positive prenatal health behaviors. We used the Stress and Adversity Inventory (STRAIN) to interview 164 women (Mage = 26.55; SD = 4.55) at one of two large Midwestern, urban hospitals after delivering their first infant. We used ordinary least squares regression models to examine associations between women's lifetime stress exposure severity and their prenatal health behaviors.

Results: As hypothesized, greater lifetime stress exposure severity was associated with engaging in more negative prenatal health behaviors (e.g., smoking, poor diet) above and beyond relevant sociodemographic factors (e.g., education, income) and current perceived stress levels, $F(8, 155) = 6.53$, $p < .001$, $R^2 = .25$. Greater lifetime stress exposure severity also predicted positive prenatal health behaviors, although unlike negative health behaviors, these effects were not robust to statistical adjustment for current stress levels, $F(8, 155) = 6.55$, $p = .65$, $R^2 = .25$.

Conclusions: In sum, life stress appears to accumulate over the life course to impact the likelihood of engaging in negative health behaviors that have, in turn, been shown to impact infant health and development. Consequently, lifetime stress exposure may be a critical target for reducing negative health behaviors and improving the health of mothers and infants.

238) Abstract 1344

THE EFFECT OF BEHAVIORAL INTERVENTIONS FOR PATIENTS AT HIGH RISK FOR MELANOMA: A SYSTEMATIC REVIEW

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Background:

Melanoma can be a fatal disease if not detected and treated early. As tumour thickness is the best predictor of survival and most melanomas develop with a visible, pre-clinical phase, there is a window of opportunity for secondary prevention via early detection. The aim of this systematic review was to assess the impact of behavioral interventions on mortality due to melanoma, melanoma early detection, and melanoma preventive behaviors: skin self-examination (SSE), partner-assisted examination (PASE), and clinical skin examination (CSE).

Methods:

This review was registered with PROSPERO (CRD42016033765). Data sources included MEDLINE, PsycINFO, EMBASE, CINAHL, and Web of Science. Articles in any language were included if they were RCTs of behavioral interventions with individuals at increased risk for melanoma, and had mortality, early detection, or preventive behaviors (e.g., SSE) as outcomes. Two independent reviewers carried out the study selection, conducted data extraction, and quality assessment (using the Cochrane Risk of Bias Tool). Results were presented as a narrative synthesis.

Results:

No studies met inclusion criteria for mortality or early detection of melanoma. We identified 12 trials assessing behavioral outcomes. Compared to non-active controls (treatment as usual), 4 (of possible 7) eligible trials found significant effects on SSE, 1 (of 2) on PASE, and 2 (of 4) on CSE. Compared to active controls, 2 (of possible 3) eligible trials found a significant effect on SSE, 2 (of 3) on PASE, and 1 (of 1) on CSE. Risk of bias was high in all trials, and the quality of the reporting was low. Results were not pooled for an overall estimate of effect because of clinical heterogeneity between studies.

Discussion:

Currently, there are no behavioral trials assessing mortality and early detection of melanoma, and the trials assessing preventive behaviors showed mixed efficacy results for the interventions. Given the large heterogeneity between studies and high risk of bias, the results from the individual trials should be interpreted with caution. Future research with more rigorous design and improved quality of reporting is needed to elucidate whether interventions for secondary prevention behaviors have an impact on health-related outcomes in groups at high risk for melanoma.

239) Abstract 1418

THE EFFECTS OF ACUTE EXERCISE ON PSYCHOPHYSIOLOGICAL RESPONSES TO STRESS

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Background: Acute psychological stress elicits increases in blood pressure (BP) and psychological responses, both of which are associated with negative health outcomes. Although it is suggested that exercise reduces these physiological and psychological responses, little is known about the effects of exercise prior to mental stress exposure on these outcomes.

Aim: To examine whether an acute bout of exercise prior to psychological stress attenuates BP and negative psychological responses.

Methods: Forty healthy participants (20 male; mean age = 19.95 ± 1.93 years) completed three laboratory sessions on separate days. Visit one: a sub-maximal exercise test was completed to calculate estimated VO_{2max}. Visit two (stress only): 10-min resting baseline followed by a standardized psychological stress task (multisource interference task (MSIT)). Visit 3 (stress following exercise): 10-min cycle task at 70% VO_{2max} and 20-min recovery, followed by resting baseline and the MSIT. Visit 2 and 3 were counterbalanced. BP was measured every 2 minutes during baseline and stress periods. Perceived threat, stressfulness, difficulty, cognitive and somatic anxiety and mood were measured immediately following stress.

Results: Significant time by session interactions suggest systolic (p = .004) and diastolic (p = .022) BP reactivity from baseline to stress were lower during stress following exercise compared to stress only. Repeated measures ANOVAs revealed that compared to stress only, in the stress following exercise condition participants reported significantly more perceived threat (p =.010), stress (p =.024), and difficulty (p =.001), experienced greater tension (p =.012), depression (p =.026), fatigue (p =.003), confusion (p =.033), and vigour (p =.022), but had lower somatic anxiety (p =.015).

Conclusions: Acute high intensity exercise prior to stress may be beneficial for BP reactivity and can lower somatic anxiety but has a negative effect on mood and perceptions of stress, including increased feelings of threat, stressfulness, and perceived difficulty. Future work should explore whether patient populations (e.g., anxiety disorders) benefit from engaging in exercise prior to stressful situations, and whether different exercise intensities alter the psychological and physiological responses.

240) Abstract 1473

PHYSICAL ACTIVITY INTERVENTION FOR LONELINESS (PAIL) IN COMMUNITY-DWELLING OLDER ADULTS: A RANDOMISED FEASIBILITY STUDY

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Physical activity interventions could reduce loneliness in community-dwelling older adults. This study aimed to examine the feasibility of such an intervention, designed asa two-arm, 12-week randomized-controlled feasibility trialconducted in Birmingham, United Kingdom from February-August 2018.

Participants were 25 healthy, inactive, community-dwelling older adults (56% female), with moderate to severe loneliness, aged 60-92 years, recruited through advertisements. The intervention consisted of once weekly outdoor group walking and health education workshops up to 90 minutes per session in total, with a wait-listed control group. The primary aim was to estimate recruitment, retention and adherence rates, as well as acceptability of the intervention and outcome measures. Outcome measures assessed at baseline and post-intervention were body mass index, resting blood pressure, physical activity using accelerometery, and questionnaires (loneliness,social support, social networks, anxiety and depression, self-efficacy for exercise, satisfaction with social contacts, and expected outcomes and barriers for exercise). Process and outcome evaluations were conducted using focus groups at mid- and end-points toassess participants' experiences of taking part in the intervention.

Forty-eight participants were recruited over 4 months with a recruitment rate of 25% (48/195); 25 were screened as eligible and consented to randomisation. At 12 weeks, 10/12 (83.3%; 95% CI 55.20 to 55.30) intervention and 10/13 (76.9%; 95% CI 49.74 to 91.72) control participants completed the final assessments. The average attendance rate was 58.3% for the intervention group (range 33-75%) and 42.3 (range 23.1 – 69.2%) among controls. Noserious adverse eventsoccurred. The focus group results were grouped into three themes which showed overall positive experiences of participation in PAIL: 1) study design and intervention, 2) walking sessions, and 3) health education workshops.

The findings suggest that community-dwelling older adults at risk of loneliness found the intervention and measures acceptable and can safely participate, however a more extensive and robust strategy would be needed to support adequate recruitment and adherence for a definitive RCT.

241) Abstract 1221

THE BDNF VAL66MET POLYMORPHISM AND CHANGES IN RUMINATION AND NEGATIVE AFFECT AFTER A 6-MONTH AEROBIC EXERCISE RANDOMIZED CONTROLLED INTERVENTION: A SECONDARY ANALYSIS

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Background: Regular exercise can be an effective behavioural strategy for reducing rumination and negative affect (NA). Yet, not all adults benefit equally from exercise. Research has shown that genetic polymorphisms, including the brain derived neurotrophic factor (BDNF) Val66Met polymorphism, may impact the extent to which exercise is beneficial to wellbeing. Thus, the purpose of the study is to examine whether the BDNF Val66Met polymorphism modifies the changes in daily rumination and NA in a caregiving population. Methods: Sixty-eight, 50-75 year old family caregivers of individuals with dementia or Alzheimer's disease were randomized to either a 6-month aerobic exercise (AE) program (N=34) or a waitlist control (WC) group (N=34). BDNF genetic variants were assayed and grouped into Val/Val (N=43) or Met carriers (N=24). Ecological momentary assessments were completed at random times within 6 set time periods on 7 consecutive days in the week prior to and in the last week of the intervention. At each random ping, participants were asked to complete questions about their current levels of rumination and NA on a visual analog scale (0-100). Multilevel model analyses were completed with random intercepts, fixed slopes and restricted maximum likelihood estimation. Results: Aerobic exercise intervention effects on rumination and NA were different between BDNF variants (interaction $p = 0.008$, $p < 0.001$, respectively). From baseline to trial's end, control (N=21) and exercise (N=22) arm Val/Val carriers all decreased in rumination (WC: $\beta_\Delta = -7.46$, CI = -10.38, -4.54; AE: $\beta_\Delta = -10.45$, CI = -13.63, -7.26) and NA (WC: $\beta_\Delta = -2.37$, CI = -3.69, -1.05; AE: $\beta_\Delta = -5.16$, CI = -6.58, -3.74), and only NA changes were significantly different by intervention arm assignment. On the other hand, WC Met carriers (N=13) significantly increased in rumination ($\beta_\Delta = 7.81$, CI = 4.08, 11.53) and NA ($\beta_\Delta = 10.01$, CI = 8.33, 11.70) over time whereas AE Met carriers (N=11) significantly decreased in both outcomes (Rumination: $\beta_\Delta = -8.40$, CI = -10.95, -5.86; NA: $\beta_\Delta = -3.37$, CI = -5.26, -1.48). These differences between the study's arms were significant. Conclusions: This study highlights the role of the BDNF Met allele in worsening both daily cognitions and affect in family caregivers that can be reversed if these adults are provided opportunities to exercise.

242) Abstract 1404

LOCAL STATISTICAL CHARACTERISTICS OF PHYSICAL ACTIVITY MAY REFLECT MOMENTARY PSYCHOLOGICAL STRESS IN AMBULATORY SETTINGS

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Backgrounds: Computerized ecological momentary assessment is a valuable method when assessing patient reported outcomes (PROs) because of its high ecological validity and time accuracy. However, some possible concerns have been pointed out: burden of repeated data inputs, measurement reactivity and discontinuity of data. They may be overcome if they can be substituted with objective measures which can be continuously collected without any burden. Therefore, the aim of this study was to explore objective measures of psychological stress in daily lives by investigating the association between stress rating scale collected by EMA and local statistics of simultaneously measured physical activity.

Methods: The subjects were both outpatients of psychosomatic medicine and healthy controls aged 20 or above. They carried off-line smart phones which were lent for one week and recorded occurrence of any stressful events and a stress rating scale for EMA when alarms were made approximately every four hours, when waking up, when going to bed and when they felt stressed. Physical activity was objectively measured as one-minute epoch zero-cross counts by actigraphs worn on non-dominant wrist. Mean and skewness during one hour around each EMA recording were calculated and within-individual associations between subscales of the stress rating scale for EMA and those statistics were tested by multilevel modeling.

Results: A total of 18 participants (eight patients and 10 healthy controls) were included. There were 986 recordings by all participants. There were significantly positive associations between psychological burden and local mean of physical activity, and between interpersonal stress and local skewness of physical activity.

Conclusions: The results may reflect changes in behavioral pattern which were related to psychological stress and these statistics of physical activity were thought to be possible substitutional measures of psychological stress.

243) Abstract 1058

RELATIONSHIPS OF SLEEP DURATION AND VARIABILITY WITH OVERALL PHYSICAL ACTIVITY IN THE HISPANIC COMMUNITY HEALTH STUDY/STUDY OF LATINOS SUENO ANCILLARY STUDY

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Sleep duration and timing influence risk of obesity, diabetes and other cardiometabolic disorders. Overall physical activity (PA) may be an important variable in the pathway from sleep to health outcomes. While some studies link both short and long sleep durations with increased health risk, limited research suggests that sleep variability, or the intra-individual inconsistency in sleep duration or timing also has health implications. Among Hispanic/Latino adults, we examined cross-sectional relationships between (1) sleep duration and PA and (2) variability in sleep duration and timing with overall PA.

The Hispanic Community Health Study/Study of Latinos (HCHS/SOL; 2008-2011) is a population-based cohort of 16,415 self-identified Hispanics/Latino adults from four urban US communities. The Sueño ancillary study recruited N=2218 participants (43.0% male; mean age=42.0 yrs) who provided demographic and health information and wore wrist actigraphy devices for ≥5 days to objectively measure sleep and PA. Sleep duration was the total time between sleep onset and offset. Sleep variability was the standard deviation of a participant's nightly sleep durations and sleep midpoints (clock time midway between sleep onset and offset). PA was the average activity count/min in active (non-rest) intervals.

Mean sleep duration was 7.6 hrs (SE=.03) and 38.5% obtained the recommended 7-8 hrs of sleep. Mean variability in sleep duration was 1.4 hrs (SE=.02) and mean variability in sleep midpoints 1.0 hr (SE=.02). Multivariable linear regression models that adjusted for demographic and health factors, complex survey design and sampling weights revealed that longer sleep duration linearly related to lower PA (B=-.130, p=.001). Variability in sleep duration was not associated with PA (B=.126, p=.081). Variability in sleep midpoints had a small but statistically significant, positive association with PA (B=.002, p=.026).

Among Hispanic/Latino adults, average sleep duration was within the recommended range but variability in durations and midpoints was high. Surprisingly, findings suggest that shorter sleep duration and greater variability in sleep midpoints were associated with higher levels of PA. Further research regarding sleep variability, its associated social/occupational factors, and its relation to health behaviors and outcomes is warranted to better inform prevention efforts.

244) Abstract 1242

THE EFFECTS OF PRENATAL CORTISOL CONCENTRATIONS ON WORKING MEMORY PERFORMANCE IN PRESCHOOL CHILDREN

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Background: Working memory is important for cognitive and academic outcomes making the optimal development of working memory an important developmental task. Extensive animal literature has reported a relationship between elevated prenatal maternal cortisol and poorer working memory performance in offspring; yet, there is a dearth of research in humans. Aims: The current study aims to investigate the effect of maternal cortisol exposure on working memory development in preschool aged children. Methods: Maternal salivary cortisol was collected over two consecutive days at three prenatal assessments in the 1st, 2nd, and 3rd trimesters. Saliva was obtained from pregnant women on the following schedule: upon waking (allowing for individualized wake times), 30 minutes after waking, and semi-randomly after the anchor times of 1130 and 2000 hours. Child working memory was assessed at age 3-4 years using the Wechsler Preschool and Primary Scale of Intelligence – Fourth Edition (WPPSI-IV) Working Memory Index (WMI), which is the gold standard intelligence measure for this age group. Data Analysis: Multilevel modelling (MLM) will be conducted. MLM will allow for the investigation of prenatal cortisol and working memory in preschool children, while accounting for the nested nature of the data. Given the longitudinal nature of the data, the level 1 variable will be the repeated measure of maternal salivary cortisol. At Level 2, we will add sociodemographics and the primary variable of interest, child working memory. Hypotheses: We hypothesize that prenatal cortisol will be associated with working memory functioning on children. We also hypothesize that the effects will be moderated by maternal demographic variables (e.g., SES) and biological sex of the child. Implications: Results from the current study will extend animal literature on the fetal programming effect of prenatal cortisol on working memory functioning in preschool aged children. These results have the potential to inform prevention and intervention strategies to promote optimal cognitive and academic functioning in children.

Note: Data collection was recently completed; however, data analysis is currently underway. Data analysis will be completed in December 2018.

245) Abstract 1322

IMPACT OF MATERNAL STRESS, POSTPARTUM DEPRESSIVE SYMPTOMS, AND CONFIDENCE IN COPING SKILLS ON ALPHA AMYLASE AMONG LOW-INCOME MOTHERS

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Research has shown that elevated levels of alpha amylase throughout the day have been associated with gestational diabetes and other stress-related health conditions during pregnancy and the postpartum period. Yet, few studies have examined psychosocial factors associated with alpha amylase among low-income mothers. The current study examined whether higher levels of stress and postpartum depressive symptoms were associated with alpha amylase among a sample of 82 low-income mothers and whether these associations were influenced by mothers' confidence in using coping skills. Study participants completed measures of perceived stress (PSS), postpartum depressive symptoms (EPDS), and their level of confidence in using specific coping skills to manage stress (MOCS; e.g., diaphragmatic breathing, progressive muscle relaxation, social support) at three months postpartum. Additionally, they provided seven saliva samples on one collection day to assess for alpha amylase (AUC). Regression analyses indicated a significant interaction between perceived stress and confidence in using coping skills on alpha amylase, such that mothers who reported more confidence in using coping skills to manage stress had lower levels of alpha amylase, but only among mothers with higher levels of perceived stress (b = -0.203, $t(81)$ = -2.22, p = 0.030). Moreover, a significant interaction was found between postpartum depressive symptoms and confidence in using coping skills on alpha amylase, such that mothers who reported more confidence in using coping skills to manage stress had lower levels of alpha amylase, but only among mothers with high levels of postpartum depressive

symptoms (b = -0.312, $t(81)$ = -2.38, p = 0.020). These results support the importance of designing and testing behavioral interventions aimed at increasing mothers' confidence in using coping skills for stress management in order to regulate biomarkers of stress, such as alpha amylase, particularly among mothers experiencing high levels of stress and depression during the postpartum period.

246) Abstract 1495

MATERNAL PSYCHOLOGICAL DISTRESS AND CHILD WEIGHT AT 24 MONTHS: INVESTIGATING INDIRECT EFFECTS THROUGH BREASTFEEDING IN THE ALL OUR FAMILIES COHORT

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Objective: Maternal mental health problems (i.e., depression and anxiety) in pregnancy and the postpartum have been associated with both decreased duration of breastfeeding and higher child weight at 24-months; however, the potential for breastfeeding to mediate the risk of mental health problems on child weight has not been examined. maternal psychological distress in pregnancy and child risk of being categorized as overweight/obese at 24 months was mediated by breastfeeding duration.

Study design: This study used data from the All Our Families (AOF) cohort, an ongoing prospective community-based pregnancy cohort of 2500 mother and child pairs located in Calgary, Canada. Depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS) and anxiety with the Spielberger State Anxiety Scale (STAI) respectively, both constructs were assessed when women were between 34-36 weeks gestation. Women were defined as experiencing clinically significant maternal psychological distress if they were above established cut scores on either the depression or anxiety measure. Breastfeeding duration was assessed postpartum via self-report. Child overweight status was defined as a weight-for-length/height z-score at or above the 97th percentile as per the World Health Organization's guidelines for child growth standards.

Results: There was not a direct relationship between maternal psychological distress and risk of a child being categorized as overweight at 24 months. However, independent of other relevant risk factors (maternal pregnancy BMI, gestational weight gain, maternal age, ethnicity, household income, and infant birthweight), clinically significant maternal psychological distress during pregnancy was associated with shorter duration of breastfeeding. Further, breastfeeding duration mediated the association between maternal prenatal psychological distress and child overweight status at 24 months for both depression (CI = .007 - .207) and anxiety (CI = .008 - .134).

Conclusion: Results suggest maternal prenatal psychological distress may be related to childhood weight gain through breastfeeding behaviour. Efforts to identify mothers experiencing psychological distress and providing supports to optimize infant feeding strategies may improve child growth and development.

247) Abstract 1504

PRENATAL PSYCHOLOGICAL DISTRESS AS A RISK FACTOR FOR HYPERTENSIVE-DISORDERS OF PREGNANCY: SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: The global incidence of hypertensive disorders of pregnancy (HDP; includes gestational hypertension, preeclampsia, preeclampsia superimposed on chronic hypertension, HELLP syndrome, and eclampsia) is estimated to affect 10%-15% of pregnant women. HDP represent a leading cause of maternal death worldwide. Several psychosocial factors have been implicated in the development of hypertension in the general population, including elevated symptoms of psychological distress such as anxiety or depressed mood. Although psychological distress is common during pregnancy, the evidence supporting psychological distress as a risk factor for HDP is mixed. The goal of the proposed systematic review and meta-analysis is to synthesize the existing literature in the area to gain a clearer understanding of the associations between psychological distress and the incidence of HDP.

Methods: We will conduct a comprehensive search of Medline, Embase, CINAHL, and PsycInfo from inception to November 2018 using terms related to "pregnancy", "psychological distress", and "hypertensive disorders". Studies will be included based on the following criteria: a) an objective (e.g. clinical diagnosis) or subjective (e.g. self-report) measure of maternal symptoms of depression or anxiety using a validated scale, b) an objective diagnosis of a HDP from a health record, physician, or objective data that allows for calculation by the researchers of the percentage of the sample with a HDP, c) longitudinal prospective research in an adult population of pregnant women, d) study statistics that can be used to calculate effect sizes. We hope to conduct random-effects meta-analyses to determine whether symptoms of psychological distress early in pregnancy are associated with incidence of HDP after adjusting for relevant covariates. A quality assessment will be included for use in bias adjustment, and stratified analyses will be conducted based on study quality, type of HDP, and category of reported psychological distress (e.g. anxiety vs depression). The literature review and meta-analysis is expected to be completed by December 2018.

Implications: Understanding the unique contributions of psychological distress to development of HDP and the possible interaction with established risk factors could lead to better screening efforts.

248) Abstract 1135

PRENATAL GLUCOCORTICOIDS AND CHILD NEUROIMAGING: A SYSTEMATIC REVIEW

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Background

The fetal programming hypothesis suggests adverse maternal prenatal experiences alter the intrauterine environment, thereby influencing offspring health and disease outcomes. There is growing interest in role of adverse maternal glucocorticoids on offspring neurodevelopment and subsequent vulnerability to mental illness. Evidence suggests both elevated endogenous glucocorticoid, cortisol, and exposure to synthetic glucocorticoids during pregnancy have specific effects on child outcomes and associate with long-term child development. Recent advances in neuroimaging techniques provide anatomical and functional images to link child brain with behavioral, cognitive and neurological outcomes. A review of association between maternal prenatal cortisol or synthetic glucocorticoid intervention and child brain outcome is lacking. Here we distill and clarify extant findings in this growing body of literature.

Methods

Relevant studies were identified through database searches in MEDLINE, EMBASE, and PsycINFO. We included data from observational studies designed to associate maternal prenatal cortisol or administration of glucocorticoid with child neuroimaging outcomes.

Results

13 studies were identified after applying inclusion/exclusion criteria. Studies were grouped according to maternal predictor variable and neuroimaging technique. Owing to heterogeneity of child brain outcomes meta-analysis was not performed.

Conclusions

Prenatal exposure to maternal and synthetic glucocorticoids likely exerts programming effects on fetal neurodevelopment with persisting consequences into childhood. However, significant gaps and

conflictions in literature on specific relationship of maternal endogenous cortisol or exposure to synthetic glucocorticoid with child brain outcome are evident. This is likely because different brain regions do not develop in synchrony but rather result of multitude of developmental processes in distinct regions each with individual development rates and timings. Therefore seemingly subtle differences in study design could lead to markedly different associations. Careful consideration must be given to the research question addressed before deciding which brain imaging technique to use; suggestions are given. Several recommendations to enable greater comparability across studies investigating programming on child neurodevelopment are discussed.

249) Abstract 1254

COPING AS A PSYCHOLOGICAL RESOURCE TO BUFFER THE EFFECTS OF MENTAL STRESSORS ON MATERNAL DISTRESS AND CORTISOL DURING PREGNANCY

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Background: Maternal stress and consequent increases in cortisol during pregnancy have broad and enduring effects on child development. According to Folkman and Lazarus, coping processes mitigate the effects of stress on psychological (e.g., distress) and physiological (i.e., cortisol) outcomes. Physiological studies during pregnancy, however, are lacking and implications of maternal coping for child development have not been examined. Here our aim was to determine whether coping behaviors moderate the association between stress and cortisol during pregnancy.

Methods: We use an ecological momentary assessment design in which measures of mental stressors, psychological distress (i.e., anxiety and depression), and salivary cortisol were collected 4 times per day within each trimester of pregnancy. Coping behaviors were assessed at the end of each day (in relation to the most stressful event of the day) using the Daily Coping Inventory, and coping behavior in the past week was assessed using the Ways of Coping.

Results: Data were collected from 85 women, mean age 31.7 years, 92% White, 42% primiparous, 87% married. Although data collection is complete, data analyses are ongoing but will be complete by March 6, 2019. We will use a multilevel model to examine the within-person association between stressors and cortisol (we expect a positive association, indicating that on occasions when stressors are higher than average for an individual, their cortisol is also higher than average). A similar analysis will be conducted for the association between stressors and psychological distress; again, we anticipate a positive association. We then add coping behaviors as moderators to determine if the association between stressors and cortisol or stressors and distress is stronger for some kinds of coping strategies (e.g., emotion focussed) compared to other kinds of strategies (e.g., problem focussed).

Discussion: The findings will be discussed in the context of psychosocial resources that are known to improve pregnancy and child development outcomes. We will examine the implications of coping as a protective factor that may mitigate the negative effects of maternal stress and distress during pregnancy on child development.

250) Abstract 1296

MOMS NEED A HAND: INFLUENCE OF PREGNANCY ANXIETY ON SOCIAL SUPPORT AND CORTISOL AMONG LOW-INCOME MOTHERS

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During pregnancy and early postpartum, biomarkers of stress, such as blunted cortical awakening responses (CAR) and flatter diurnal slope, have been associated with increased risk for postpartum depression, anxiety, and altered sleep. Social support is posed as a mechanism which buffers against many deleterious effects of stress, including stress pertaining to pregnancy and motherhood. The present study examined whether various dimensions of social support (i.e. total support, emotional/informational, affectionate, tangible, and positive social interaction) were associated with salivary cortisol measures (i.e. area under the curve, cortical awakening response, and diurnal slope) and whether this association was influenced by pregnancy-related anxiety, given that increased levels of pregnancy-related anxiety is implicated with negative health outcomes in infants. Our sample consisted of 87 low-income minority women from a larger stress management study who reported their levels of perceived social support (MOS-Social Support) and provided seven saliva samples (four morning samples; 12 pm, 4 pm, 8 pm) during their second trimester of pregnancy and at three-months postpartum to assess for cortisol. During the second trimester, results showed a significant interaction between affectionate support and pregnancy-related anxiety on CAR, such that low-anxiety women who reported more affectionate support displayed higher levels of CAR than those reporting less affectionate support, $R^2 = .15$, $F(4, 82) = 3.70$, $p = .008$; there was no difference in CAR observed for high-anxiety women, regardless of their affectionate support. At three-months postpartum, results revealed a significant interaction between positive social interaction and pregnancy-related anxiety on diurnal slope, such that high-anxiety women who reported having more positive social interactions had a steeper decline in their cortisol levels throughout the day (diurnal slope) than those reporting less positive social interaction, $R^2 = .11$, $F(4, 76) = 2.47$, $p = .052$. These results further elucidate the association between social support and cortisol among low-income mothers, suggesting that social support may serve as a buffer to experiencing altered cortisol patterns during pregnancy and postpartum. Further research examining the role of social support on cortisol outcomes in this population is needed.

251) Abstract 1803

DISENTANGLING THE RELATIONSHIP BETWEEN SLEEP, PAIN, AND INTERNALIZING SYMPTOMS DURING PREGNANCY

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Background. Internalizing symptoms, namely depression and anxiety, have been found to mediate the relationship between pain and insomnia symptoms. In these cases, reduced functioning of the amygdala, as a result of disturbed sleep, heightens the risk of developing depression or anxiety symptoms. Internalizing symptoms, in turn, have been associated with increased incidences of pain, pain-related distress, and functional impairment due to pain. In pregnancy, pain, insomnia, and internalizing symptoms are highly prevalent and have been found to worsen with gestational age. However, the relationship of these symptom clusters throughout pregnancy is not well understood. As pain, insomnia, depression, and anxiety have all been linked to negative health outcomes during birth and postpartum it is important to understand potential comorbidity and associations between these risk factors. **Research Questions:** 1) Will self-reports of greater insomnia be related to higher pain intensity, pain interference, and negative affect as a result of pain? 2) Is the relationship between insomnia and pain intensity, pain interference, and negative pain affect each mediated by internalizing symptoms? **Methods.** A total of 120 women were recruited from low-risk maternity clinics in Western Canada to complete an online questionnaire at three time points (less than 20 gestational weeks, between 20-30 gestational weeks, and between 30-40 gestational weeks) during pregnancy. Currently, data collection is complete for the T1 and T2 questionnaires and all responses for the T3 questionnaire will be collected by mid-January 2019. Pain characteristics are assessed using the PROMIS Pain Intensity and Interference Scales and the Pain Questionnaire. Insomnia symptoms are assessed using the Insomnia Severity Index. Regression analysis will be conducted to test the association between insomnia symptoms and pain symptoms at each time point and internalizing symptoms will be tested as mediators in the sleep-pain relationship. **Projected Results.** It is expected that

that higher insomnia scores will be significantly related to higher pain intensity scores, higher pain interference scores, and greater pain affect. It is also hypothesized that there will be three significant mediation models where internalizing symptoms mediate the relationship between insomnia and all three pain symptoms.

252) Abstract 1301

TRAIT MINDFULNESS AS A PREDICTOR OF PSYCHOLOGICAL AND PHYSICAL OUTCOMES IN PREGNANCY

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In recent years, research on mindfulness-based interventions has extended to the prevention of psychopathology, physical conditions and stress during pregnancy. However, little research has been conducted on the relation of trait mindfulness to the presence of psychological and physical symptoms during the perinatal period. This prospective study aimed to examine the relationship between trait mindfulness with stress, anxiety, depression and physical symptoms during each trimester of pregnancy. A total of 510 women recruited from obstetrical clinics affiliated with McGill University (mean age: 33.2 years, SD=4.22; 60% primiparous) completed standardized on-line self-report questionnaires in each trimester. In the first trimester, the Mindful Awareness and Attention Scale (MAAS) was administered to measure trait mindfulness. Once per trimester, participants completed the Perceived Stress Scale (PSS-10), the Edinburgh Postnatal Depression Scale (EPDS), the Prenatal Distress Questionnaire-revised (PDQR) and a measure of pregnancy symptom intensity, which included symptoms such as morning sickness, swelling and back pain. In the second and third trimesters, women self-reported whether they had received a diagnosis of gestational diabetes or high blood pressure.

Primary analyses were repeated measures general linear models (3 Time x MAAS score). These showed that MAAS scores significantly predicted PSS scores, EPDS scores, PDQR scores and the self-reported severity of pregnancy discomforts throughout pregnancy. There was an interaction between Time and MAAS scores for PSS scores, indicating that MAAS scores were a stronger predictor of PSS scores in early than late pregnancy. However, multiple logistic regressions found that trait mindfulness did not predict the presence of physical discomforts, diabetes or high blood pressure during pregnancy.

These results support the hypothesis that trait mindfulness is an important predictor of subjective stress, depression and anxiety during pregnancy. Trait mindfulness also predicted the severity, but not the presence, of physical discomforts throughout all trimesters. In conclusion, these findings support the continued study of interventions designed to increase mindfulness during pregnancy with the intention of preventing adverse psychological and physical outcomes.

253) Abstract 1592

CHARACTERIZING DIURNAL CORTISOL PATTERNS OF THIRD TRIMESTER PREGNANT WOMEN IN URBAN LOS ANGELES

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Pregnancy is a vulnerable time period that involves hormonal dysregulation that may pose risks for both maternal and fetal health. Emerging epidemiological evidence shows that fetal glucocorticoid overexposure associates with future risk for mental health disorders, cardiovascular disease, and alternations to glucose metabolism. Although there are protective mechanisms to prevent fetal glucocorticoid overexposure, increased social stressors and possibly environmental exposures, may alter these protective mechanisms. In the U.S., racial groups such as non-Hispanic Black and Hispanic females experience higher environmental pollution burdens and a higher proportion of stressful life events in the year prior to birth compared to non-Hispanic Caucasian females.These social and environmental and health disparities affecting these groups and their association with health outcomes has not been well studied. The "**M**aternal **A**nd **D**evelopmental **R**isks from **E**nvironmental and **S**ocial Stressors (**MADRES**)" study is large, prospective pregnancy cohort of lower income, predominantly Hispanic women in Los Angeles. The MADRES study will examine whether social and environmental exposures (such as air pollution and metals)lead to worsened maternal and infant health outcomes. The MADRES Center has currently enrolled approximately 600 women. As part of the study, hypothalamic-pituitary-adrenal (HPA) axis function will be characterized via cortisol diurnal patterns in the third trimester. Participants provide for saliva samples on one day: one at awakening, +30minutes post awakening, one in the later afternoon, and one at bedtime. Cortisol data will then be analyzed for modeling of diurnal curves and calculation of the cortisol awakening response (area under the awakening response with respect to zero), total cortisol levels (area under the diurnal curve with respect to zero), and diurnal cortisol slope (diurnal slope anchored to awake using rise over run). The aim of this study will be to characterize the HPA axis function of predominantly Hispanic pregnant women in Los Angeles. Associated future aims will be to associate HPA axis activity with maternal outcomes, such as post-partum depression, and infant health outcomes including birth weight and infant growth trajectories.

254) Abstract 1569

BEYOND MALTREATMENT AND ADVERSITY: PARENTING STYLE, DISORGANIZATION, AND SALIVARY CORTISOL REACTIVITY.

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Introduction: Characteristics of the early family environment (EFE) are associated with poor health outcomes (Repetti, Taylor, Seeman, 2002). This association is partially explained by differences in stress physiology and the early social environment. The current study examined the moderating relation of individual differences in the EFE on cortisol reactivity and interpersonal stressors.

Methods: A sample of 165 young adults (52% female, median age = 21) completed self-report baseline measures of socioeconomic status and EFE. They then participated in a laboratory stress reactivity task, which manipulated three types of interpersonal stress (relative social status, exposure to dominance from an interaction partner, and exposure to social-evaluative threat). The study design was a fully crossed 2 (Status: higher or lower) x 2 (Partner Behavior: dominant or submissive) x 2 (Evaluative threat: high vs. low) factorial design. Salivary cortisol was collected at three timepoints: a baseline assessment and two reactivity assessments at 25 and 35 minutes after the start of the stress exposure.

Results: After controlling for gender, parental income and time since waking, ANOVA analyses revealed a significant three-way interaction among EFE characteristics and two of the three interpersonal stress manipulations – relative status and partner dominance ($\eta^2 = .181$, $p = .03$). Participants from warmer, more nurturing EFEs showed greater cortisol reactivity to partner dominance when they perceived they were lower status than their partner and did not show significant reactivity to perceptions of being lower status if the partner was submissive (rather than dominant). However, participants from more hostile and disorganized EFEs showed similar cortisol reactivity to both exposures (approximately 2 nmol/L increase), only showing non-significant reactivity when they were in the low stress combination condition (perceived higher status and submissive partner).

Conclusion: Individual differences in EFE moderated cortisol reactivity to interpersonal stress exposures. Results suggest that more hostile and disorganized family environments are associated with more uniform reactivity to interpersonal stressors associated with social rank, whereas individuals from warmer family environments are more or less reactive to status concerns depending on partner behavior (i.e., dominance).

255) Abstract 1426

EARLY ENVIRONMENTS, PARENTAL OVERPROTECTION, AND SUSCEPTIBILITY TO THE COMMON COLD

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Early risky environments increase the risk for poor physical health across the lifespan (e.g., Ehrlich, Miller, & Chen, 2016). Nevertheless, many people raised in adverse environments remain healthy. Numerous protective factors, including nurturant parenting, have been identified. Some evidence suggests that vigilant/protective parenting (i.e., the tendency to closely monitor children; e.g., Omer, Satran, & Driter, 2016) may be protective for youth in high-risk environments. The current study utilized a viral challenge design (commoncoldproject.com; PI: Dr. Sheldon Cohen) to assess whether overprotective parenting reduces cold susceptibility following inoculation with a cold virus for adults who grew up in high-risk environments.

Participants were 213 adults ages 18-55 (M = 30.1, SD = 10.9) who reported on the safety and social environment of their childhood neighborhood and their parents' overprotection (via the overprotection subscale of the Parental Bonding Instrument). Participants were then inoculated with a common cold virus and quarantined for five days. Throughout the quarantine, participants underwent blood draws and completed assessments of objective cold symptoms. Participants were diagnosed with the cold if they met two criteria: 1) they were infected with the virus and 2) they met objective symptom criteria.

Regression analyses evaluated whether early environments and parental overprotection influenced clinical cold diagnosis and IL-6 production among all participants, and mucus weight and nasal mucociliary clearance time among only those who were infected with the cold virus. Significant childhood environment × parental overprotection interactions emerged for cold susceptibility, IL-6 production, and mucus weight (ps < .05), and was trending for nasal mucociliary clearance time (p < .07). For those who reported riskier childhood environments, high (vs. low) parental overprotection predicted lower cold susceptibility (*effect* = -.1641, p = .05, n = 212). High-risk childhood environments were also associated with declines in IL-6 production (t[212] = -2.04, p = .04, b = -4.35) and mucus weight (t[160] = -2.02, p = .04, b = -.97) when parental overprotection was high.

Results provide further support for the notion that effective parenting can buffer youth from negative consequences associated with risky environments.

256) Abstract 1646

THE RELATIONSHIP BETWEEN EARLY FAMILY ENVIRONMENT AND RESTING HIGH-FREQUENCY HEART RATE VARIABILITY

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Research has emphasized the significance of early environmental influences on adult health outcomes. Growing up in a risky early family environment characterized by neglectful parenting, overt conflict, and unsupportive relationships is a risk factor for poor emotion regulation, while optimal parental bonding, characterized by adequate care and protection, appears to be a protective factor. Poor emotion regulation, in turn, is associated with increased risk of poor physical health. Recent theory highlights the role of resting high-frequency heart rate variability (HF-HRV) for cardiovascular health and in the regulation of emotion. Recent research supports the notion that lower levels of resting HF-HRV are associated with poor emotion regulation. To test the hypothesis that growing up in a risky early family environment is associated with poor emotion and that optimal parental boding is associated with better emotion regulation, we conducted secondary data analyses on a publicly available data set. Participants (n=213, M_{age} = 30.13 years, SD= 10.85; 57.7% men) from the Pittsburgh Cold Study 3, completed demographic questionnaires along with two retrospective self-report questionnaires designed to assess early family environment, the risky families questionnaire and the parental bonding instrument. Height and weight were measured prior a 20-minute resting baseline session of a laboratory stress protocol. Electrocardiogram (ECG) and respiration data were measured continuously during the resting baseline session. Spectral analysis was applied to the raw ECG data in order to derive HF-HRV. Data from the last 5-minutes of the resting baseline period were averaged to create resting respiration rate and resting HF-HRV measures. In regression analyses controlling for age, sex, race, body mass index (BMI), and respiration rate we found that a risky early family environment was negatively associated with resting HF-HRV, b = -.014, t = -1.991, p <.05 and parental bonding was positively associated with resting HF-HRV, b =.025, t = 2.225, p <.05. Our findings provide evidence to suggest that early family environments exert considerable influence on both cardiovascular functioning and emotion regulation in adulthood. Therefore, targeted family interventions could prove to be an effective strategy for promoting and improving both psychological and cardiovascular health.

257) Abstract 1049

STRESSFUL LIFE EVENTS AND DIURNAL CORTISOL SLOPES: THE ROLE OF AFFECTIVE DISPOSITIONS

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Background: Exposure to stressful life events is not always associated with biological functioning, including cortisol regulation, and ultimately health. The diathesis-stress model suggests that cortisol dysregulation is the result of the interaction between stressful life events and individual dispositions. Very few studies, however, have examined whether the effect of stressful life events on diurnal cortisol slopes, the latter which commonly refers to cortisol changes from morning to evening, may depend on affective dispositions. The aim of this study was to examine whether stress life events would interact with negative and positive affectivity to predict diurnal cortisol slopes.

Method: Cross-sectional data were collected from a sample of 645 children (335 boys, 8-15years of age) affected by parental HIV in a rural county, China. Stressful life events, negative affectivity, positive affectivity, and saliva cortisol samples at four times of the day for three consecutive days were collected. Multilevel models were performed to test the hypotheses as well as account for the nested data structure.

Results: There were no main effects of stressful life events on diurnal cortisol slopes. However, stressful life events interacted with negative affectivity to predict diurnal cortisol slopes, controlling for sport exercise, smoking, wakeup time, day of the week (weekday vs weekend), gender, and age. Specifically, we found that stressful life events were associated with blunted diurnal cortisol slopes among children with high negative affectivity (t = 2.268, p = .023), but not among children with low negative affectivity (t = -1.515, p = .130). There was also an interaction effect between stressful life events and positive affectivity on diurnal cortisol slopes. Stressful life events were associated with blunted diurnal cortisol slopes among children with low positive affectivity (t = 2.508, p = .012), but not among children with high positive affectivity (t = -1.194, p = .232).

Conclusion: Our findings suggest that affective dispositions may alter the effect of stressful life events on diurnal cortisol regulation, and they may also help to understand why some children thrive vs. succumb in the face of stress.

258) Abstract 1638

THE PSYCHOPHYSIOLOGICAL IMPACT OF BEING TOLD YOUR CHILDHOOD PUTS YOU AT RISK

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Adverse childhood experiences (ACE) are related to a host of poor health outcomes in adulthood. A pathway that links childhood experiences to the development of chronic illness in adulthood is excessive stress reactivity. Informing ACE survivors of these risks may be a first step in helping them manage their stress reactivity and avoid the adverse consequences of ACEs. In this study participants completed childhood trauma questionnaires and were given false feedback that their childhood experiences put them at increased risk for excessive stress reactivity and the development of disease. Following this "ACE insight," participants performed a speech task during which blood pressure reactivity, heart rate variability, and other cardiovascular parameters were monitored, and psychological reactions were assessed. Adverse childhood scores were positively associated with feeling worried (r =.23, p<.01) and negatively associated with feeling happy (r = -.26, p<.05) about the false feedback. Regression analyses indicated that there was an interaction effect of actual adverse childhood scores and ACE insight (ß = -.26, *p* = .07, ?R2 = .034) on self-reported stress responses compared to the average. Specifically, those with less adverse childhoods reported a greater than average stress response after false feedback. In contrast, there was no effect of our manipulation on those with more adverse childhoods, who reported greater than average stress responses in both conditions. In other words, participants with adverse childhoods already believed that they were excessive stress responders. In terms of participant physiology, individuals with more adverse childhoods entered the laboratory with lower cardiac output (ß = -.32, p < .01). An interaction between actual ACEs and ACE insight showed that there was a significant increase in cardiac output during the speech task for participants with more adverse childhoods (ß = .28, p < .05, ?R2 = .038). This effect was not evident for those with less adverse childhoods. Together, the psychological responses of those with less adverse childhoods and the physiological responses of those with more adverse childhoods suggest that ACE insight may provide an external cause for one's excessive stress responding and affect how an individual copes with and engages in a stressful situation.

259) Abstract 1754

CHILDHOOD ADVERSITY AND ADULT SLEEP: THE ROLE OF DEPRIVATION AND THREAT

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There are robust associations between childhood adversity (CA) and poor physical health in adulthood. Despite the strength and consistency of these findings, we know little about the mechanisms through which CA leads to future health risk. Sleep is a possible mechanism linking CA to adult health. Yet, the prevailing approach for testing associations between CA and adult sleep offers little insight into which aspects of CA are related to specific sleep outcomes. To better understand associations between CA and adult sleep, we tested a novel conceptual model that distinguishes between *threat*, which involves harm, or the threat of harm (e.g. physical, emotional and sexual abuse), and *deprivation*, which involves absence of expected cognitive and social inputs (e.g. emotional and physical neglect). Participants (N= 79; M_{age}= 27.48(SD=6.53); 68% Female) were screened for insomnia, mental health conditions and physical illnesses. Participants completed demographic and depression measures, along with the Childhood Trauma Questionnaire, a self-report retrospective measure that captures dimensions of *threat* and *deprivation*. Sleep duration, latency, efficiency, wake after sleep onset (WASO), and secondary sleep onset latency (SSOL) were averaged across 3 consecutive days of wrist actigraphy and sleep diaries. Daily morning ratings of sleep-quality and non-restorative sleep and nightly ratings of alcohol use and stress were averaged across 3 days. Structural equation modeling (SEM) was used to account for missing data. All SEM models included correlated measures of *deprivation* and *threat* and controlled for age, sex, BMI, alcohol use, daily stress, and depressive symptoms. All SEM models had good model fit (RMSEAs ≥ .07, TLIs ≥ .65, all X^2 *ps* >.05). In SEM models, *threat* was significantly positively associated with non-restorative sleep (*b* = .046, *p*<.001) and sleep quality (*b*=.025, *p*=.008). *Deprivation* was significantly negatively associated with diary-based WASO (*b* = -.076, *p* = .003) and SSOL (*b*= -.118, *p*=.004). *Deprivation* and *threat* were unrelated to all other sleep outcomes (*ps* > .05). These results are important, as they begin to clarify associations between related, but distinct forms of CA and specific adult sleep outcomes. Identifying specific pathways linking CA and adult health is critical for developing interventions and mitigating future health risk.

260) Abstract 1277

THE ROLE OF EARLY LIFE STRESS IN THE DEVELOPMENT OF AUTOIMMUNE THYROID DISORDERS

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Background

Autoimmune thyroid disorders (AITD) are the most prevalent autoimmune diseases. The aetiopathogenesis of AITD, which include Graves' disease and Hashimoto's thyroiditis, is multifactorial. Apart from a strong genetic predisposition towards autoimmune diseases, certain environmental conditions appear to precipitate these illnesses. A frequent observation is that AITD are preceded by prolonged states of immune suppression (e.g., pregnancy, intake of antiretroviral medication). In light of the ever-increasing evidence that early life stress can compromise immune functioning in the long term, it is conceivable for individuals growing up in such conditions to be at elevated risk of developing an AITD. However, so far, this hypothesis remains untested. The aim of this research was to investigate for the first time whether patients with AITD are more frequently affected by early life stress when compared to healthy controls.

Methods

Female patients with AITD (n=70) and age, sex, and BMI matched healthy controls (n=70) were recruited in the greater Zurich area. All patients underwent standardised diagnostic procedures at a specialised clinic for thyroid disorders, including laboratory testing and sonography. N=53 had Hashimoto's thyroiditis, n=8 had Graves' disease, and n=9 had other types of AITD. Early life stress was measured using the Childhood Trauma Questionnaire (CTQ), which includes questions on sexual, physical, and emotional abuse, and on physical and emotional neglect.

Results

Patients with AITD did not differ from healthy controls in terms of sexual abuse, physical abuse, or physical neglect (all p>.144). However, they were significantly more likely to have experienced emotional abuse (*p*=.009) and emotional neglect (*p*=.048).

Conclusions

Patients with AITD appear to be more frequently affected by early life emotional abuse and neglect. These findings fit in well with evidence showing that early life stress can exert long-lasting effects on immune functioning, which in turn may facilitate the onset of AITD. Prospective studies are now warranted to replicate these findings, and preferably in larger, population-based samples. Provided that future research corroborates these findings, appropriate measures to counteract the detrimental sequelae of early life stress should be taken, especially in those individuals with a genetic predisposition towards AITD.

261) Abstract 1814

PARENTING STYLES ARE ASSOCIATED WITH ADOLESCENT GIRLS' LIFETIME STRESS EXPOSURE

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Research has shown that harsh or negligent parenting styles predict higher rates of anxiety and depression in children exposed to everyday stressors (Sheldow et al. 2014). However, little research exists on how these parenting practices specifically affect female adolescents. The goal of this study, therefore, was to examine how mothers' and fathers' parenting styles structure the lifetime stress exposure of their adolescent female offspring.

Participants were 49 daughters (M_{age}=14.88, SD=1.24) who rated their relationship with their biological mother and father using the Parental Bonding Instrument (Parker et al., 1979), which assesses parental styles during childhood. Both maternal and paternal parenting styles were categorized into four categories: affectionate constraint, optimal parenting, affectionless control, and neglectful parenting. Daughters also completed the Stress and Adversity Inventory for Adolescents (Slavich & Shields, 2018), which assessed daughters' lifetime exposure to both acute and chronic stressors.

An ANOVA test compared parenting styles and adolescent girls' lifetime stress exposure. Paternal parenting style was significantly associated with daughters' total lifetime stressor count (p=.026) and severity (p=.015). Specifically, there was a significant difference between the means of optimal parenting and affectionless constraint for both total stressor count (p=.0193) and severity (p=.0076). These effects were particularly strong for total severity of all stressors involving interpersonal loss (p=.0066) and for acute life events involving interpersonal loss (p=.0035). Additionally, daughters who reported optimal parenting had less severity of acute life events than those experiencing affectionless control (p=.0037). Daughters reporting optimal parenting also had less total severity of interpersonal loss than those with affectionless control (p=.0092). Maternal parenting style, in contrast, was unrelated to daughters' lifetime stress exposure.

In conclusion, although studies often highlight the influence maternal parenting has on offspring outcomes, these data highlight the influential role that paternal parenting plays in structuring the stressors that daughters experience over the lifespan. Additional research is thus needed to further examine these effects to reduce daughters' stress exposure and improve their lifespan health.

262) Abstract 1645

CHILD MALTREATMENT, PROTECTIVE FACTORS DURING ADOLESCENCE, AND ADULT PHYSICAL AND PSYCHOLOGICAL WELL-BEING

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Childhood maltreatment is associated with greater risk for chronic diseases and psychological disorders in adulthood. However, protective factors in adolescence may mitigate the extent to which maltreatment influences adult psychological health and also buffer against physiological repercussions of maltreatment. Few studies have assessed associations of youth protective factors with adult physical and psychological health measures concurrently.

The study sample was 5,173 adults (29.07 ± 1.75 years) from The National Longitudinal Study of Adolescent to Adult Health who experienced early-life maltreatment. The main outcome measure was health profile type, which contained 4 groups: good physical and psychological health, poor physical but good psychological health, good physical but poor psychological health, and poor physical and psychological health. Poor physical health was indicated if respondents had any of the following: a chronic disease diagnosis (i.e., hypertension; high cholesterol; diabetes), high blood pressure (> 130/80 mm Hg), clinically significant levels of glycated hemoglobin (HbA1c > 5.7%) or C-reactive protein (> 3 mg/L). Poor psychological health was indicated if respondents had a common mental health diagnosis (i.e., depression; anxiety; PTSD) or reported experiencing frequent negative emotions. Multinomial logit models were fit to assess how 3 protective factors—adolescent self-esteem, family connectedness, and school connectedness—predicted adult health profiles.

Higher adolescent self-esteem was associated with lower odds of good physical but poor psychological health (log odds = -.30, SE = .11, p = .006) and overall poor health (log odds = -.39, SE = .10, $p < .001$) compared to overall good health, but not to good physical but poor psychological health in adulthood. Similar patterns were found for family connectedness. School connectedness was not predictive of health profiles.

Higher self-esteem and more family connectedness were generally associated with better adult psychological, but not physical, well-being among those with a maltreatment history. This suggests that the stress-buffering effects of certain protective factors in adolescence on adult health outcomes may only be skin-deep.

263) Abstract 1828

PARENTAL SOCIAL PARTICIPATION DURING CHILDHOOD AND ADOLESCENCE PREDICTS ADULT SOCIAL INTEGRATION

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The number of social roles one participates in, also known as social integration (SI), has repeatedly shown to be associated with and predictive of a wide range of health outcomes. For example, those with high levels of SI live longer (Berkman, 1995), are less likely to develop coronary heart disease (Chang et al, 2017), see less lung function decline with age (Crittenden et al, 2018), and have increased protection from infectious illness (Cohen et al, 1997).

Despite the plethora of studies indicating the health benefits of increased SI, little research has been conducted assessing the inter-generational transmission of diverse social participation from parent to child. While most research looks at the influence of parent social participation on child and adolescent social involvement, this abstract investigates the association of parental social participation on the adult child's level of SI.

Data was analyzed from the Pittsburgh Cold Study 3 (PCS 3), which was conducted from 2007-2011. A total of 213 participants between the ages of 18 and 55 filled out in-depth questionnaires regarding their parents' level of social participation when the participant was 5, 10 and 15 years old, as well as their own current level of social integration. Parent level of social participation was measured using a Parental Social Participation (PSP) questionnaire and participant level of current SI was measured using the Social Network Index (SNI). A wide range of demographics were also collected.

PSP at age 5, 10 and 15 were highly correlated, and so an average score of social participation across the three was used in analyses. Analysis of variance showed that even when including participant age, sex, race, and income into the model, parental social participation was significantly associated with SNI, such that higher levels of parental social participation led to increases in adult SI (F=3.656, p=.003).

Results indicate that exposure to parental social participation may play an important role in the development of diverse social networks in adulthood. The next important step is to see whether this inter-generational transmission of SI is essential to the beneficial nature of diverse social roles, or whether one can see benefits despite the social environment in which one was raised.

264) Abstract 1173

EXPOSURE TO CHILDHOOD ADVERSITY IS ASSOCIATED WITH POOR ADULT SLEEP HEALTH

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Background: Exposure to adverse childhood experiences (ACEs) in the home environment may be related to poorer sleep health, even in those without sleep disorders or psychiatric illness. Sleep health is a multi-dimensional construct that takes a 24-hour approach to the study of sleep. We examined whether exposure to ACEs in the home and as well as those experienced outside the home, i.e. expanded ACEs, impact sleep health.

Methods: Participants (N=540; 50% female; 29% non-white) were healthy undergraduates 18-28 years old. Online surveys assessed exposure to ACEs and expanded ACEs before age 18, as well as current sleep, mood, and health. ACEs were categorized into 0, 1, or 2+ exposures, while expanded ACEs were summed to create a 0-4 score. Sleep health was measured using the 6-item self-report "RuSATED" scale that queries typical sleep duration, efficiency, quality, timing, regularity, and daytime alertness; responses were summed to create a 0-12 scale, with higher scores indicating better sleep. Childhood sleep problems were measured via four items on a 3-point scale; responses were summed to create a 0-8 composite, with higher scores indicating more problems. Linear regression was utilized, adjusting for age, sex, race, BMI, smoking, and depressive symptoms.

Results: Overall, 48%, 25%, and 27% of the sample experienced 0, 1, or 2+ ACEs. Reporting 2 or more ACEs was associated with poorer adult sleep and more childhood sleep problems, compared to 0 ACEs (Table 1). Reporting more expanded ACEs was associated with more childhood sleep problems, but not with adult sleep (Table 1). See Table 1 for individual ACE and expanded ACE items and sleep outcomes, although results should be interpreted cautiously given low power. Data analysis is currently underway for the roughly 1/3 of the sample who also completed a seven-day actigraphy and daily diary protocol.

Conclusions: Results suggest that exposure to 2+ ACEs is related to poorer childhood and adult sleep, but perhaps exposure to 1 ACE is not a problem for sleep. However, it is likely that poor sleep health did not just emerge in adulthood, and may be related to childhood sleep problems, which is relevant when considering prevention and intervention strategies.

Research Support: T32HL07560

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265) Abstract 1565

EARLY LIFE STRESS MODERATES THE ASSOCAITION OF LIFE STRESS AND ATHEROSCLEROSIS RISK IN A COHORT OF NURSING STUDENTS

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Background: Evidence suggests that early life stress exposure increases susceptibility to cardiovascular disease, but the underlying pathways remain unclear. By programing a stress-sensitive phenotype characterized by hyper-vigilance and augmented inflammatory responses, early life stress might moderate the effect of stress on CVD. We explored this pathway here by estimating the modifying effect of early life stress on the stress-atherosclerosis association. Atherosclerosis is an ideal endpoint because it's a process that starts early in life, is associated with lifetime stress and mechanistically centered on peripheral inflammation.

Methods: We utilized both cross-sectional (n=423) and longitudinal (n=75) data from a cohort of nursing students (80% female;90% Hispanic;mean age= 25;ACE ≥ 4, 21%). Serum levels of CRP, TNFα, IL-1β, IL-6 and IL-8 were measured via multiplex assays. Carotid intima media thickness (CIMT) was measured via ultrasound images. Lipids and blood pressure were measured via standard techniques. Life stress exposure was assessed using the Stress and Adversity Inventory, which measures total lifetime stressor count by domain (e.g., education, work) and timeperiod (e.g., early life, adulthood), along with their respective severity. Atherosclerosis profiles across tertiles of early life stress, and total lifetime and education-related stressor exposure were studied via generalized linear modeling. Stress sensitivity due to early life stress was investigated via changes in atherosclerosis profile and education-related stress between baseline and follow-up. Lastly, moderated multiple regression was used to assess the interaction between early life stress and total lifetime stress count and its effect on CIMT and other atherosclerosis endpoints, while controlling for age, gender, and BMI.

Results: Higher lifetime stressor count was related to greater diastolic blood pressure, IL-8, and lower TNFα. Early life stress was associated with lower triglycerides, CIMT, and CRP. Preliminary results show that the interaction between early life stress and total lifetime stressor count was not significant. Further analyses will focus on other life stressors and adverse childhood experiences.

Discussion: Early life stress is associated with indicators of atherosclerosis, but this association might not be mediated by an increased sensitivity to life stressors.

266) Abstract 1270

PHYSICIANS' KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING SCREENING ADULT PATIENTS FOR ADVERSE CHILDHOOD EXPERIENCES (ACES)

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Adverse childhood experiences (ACEs) are common and there is substantial evidence of their association to health outcomes, quality of healthcare and quality of life. Although physicians routinely screen adult patients for disease risk factors, it is uncommon to routinely screen for ACEs. In order to assess potential educational needs, we conducted a survey of Ontario physicians to determine if screening attitudes and behavior are related to knowledge about ACEs or medical specialty, and to assess perceived barriers. Methods. An online survey was distributed to physicians affiliated with Ontario medical schools and a link to the survey was posted on a website of the Ontario College of Family Physicians. Recruitment is ongoing. Interim Results. Of 170 participants, 78 were family physicians, 45 psychiatrists and 47 practiced other specialties. Fifty four (32%) screen for ACEs "never or not usually", 60 (35%) "when indicated", 49 (29%) "routinely", and 7 (4%) "other" or no response. Screening behavior was strongly associated with specialty. The modal response in family physicians was "when indicated" (67%), next was "never or not usually" (23%), in psychiatrists it was "routinely" (91%), and in other specialists it was "never or not usually" (77%: $Chi^2 = 168$, $p < .001$). Screening behavior was not related to accurate knowledge of the prevalence of ACEs, or to knowledge of the link between ACEs and mental health, but was significantly associated with lack of knowledge of the link between ACEs and physical health (stroke, ischemic heart disease, COPD, diabetes: MANOVA, each $p \leq .001$, $R^2 \geq .08$). Most prevalent perceived barriers to asking about ACEs were: lack of mental health resources (60%), lack of time (59%), concern about causing distress (50%), lack of confidence (45%), and expected lack of impact on care (42%). Conclusions. Enhancing knowledge of the link between ACEs and physical health outcomes may be a lever for physician behavior change, especially for non-psychiatrists. Efforts to increase rates of screening should attend to concerns that screening is time-consuming, will increase referrals to scarce mental health resources and doesn't affect care. Education should focus on increasing confidence with screening, especially confidence in managing distress if it arises.

267) Abstract 1797

PRACTICAL AND EFFECTIVE: INTRODUCING CONTEMPLATIVE PRACTICES TO COLLEGE STUDENTS TO IMPROVE WELL-BEING

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National surveys indicate that psychological and physical well-being of college students has dropped to one of its lowest levels in the past 25 years. One potential strategy to address these challenges is mindfulness training (MT). MT helps individuals take better care of themselves by understanding the mind-body connection and mobilizing inner resources for coping, healing, and thriving. Training in mindfulness (paying attention, on purpose, in the present moment, nonjudgmentally) can positively affect one's ability to reduce symptoms of psychological/physical distress.

In four studies, we ask whether MT can be integrated into the normal routine of undergraduates and then assess its impact.

Study One included participants (N=35; mean age 19.8) enrolled in one of two upper-level courses. As compared to the control class, weekly MT increased students' self-compassion $F(1, 32) = 4.79$, $p=.036$, and decreased their self-criticism $F(1, 32)=5.03$, $p=.032$. *Study Two* showed that self-compassion training could be implemented in a first-year seminar (when students are particularly vulnerable to declines in well-being) (N=23; mean age 18.2). Data analyses revealed changes in the expected directions: Improved well-being, increased self-compassion, and decreased self-criticism. *Study Three* showed that a 15-wk MT program could be integrated into the practices/competitions of a collegiate soccer team (N=21). Athletes reported improvements in calmness and present-minded focus, and reductions in negative self-talk and distractions. *Study Four* integrated mindfulness practices into a Health Psychology curriculum that emphasized inclusion and cultural competency. As determined by independent, trained raters evaluating end-of-course essays, students (N=19) demonstrated proficiency in understanding and applying diverse perspectives to issues in health psychology, health promotion, and health disparities.

These studies suggest that MT can be feasibly integrated into a college student's life with a positive impact. In none of these studies did we suggest to the students that they must practice. Instead, we attempted to make the practices as accessible as possible. Students could opt-out of any of the practices, but most tried to use mindfulness-based strategies in the context of their classroom or athletic endeavor.

268) Abstract 1564

ABAB SINGLE CASE DESIGN: EXAMINING THE SHORT-TERM INTRACRANIAL EGG PATTERNS DURING A MEDITATIVE STATE AND AN ACTIVE CONTROL.

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Background

Patterns of electroencephalography (EEG) activity during particular meditative states have been investigated. High-frequency neural activity overlaps with the spectral bandwidth of muscle activity (~20–300 Hz). Therefore, muscle activity may contribute to reports of high-frequency activity recorded with scalp EEG. Acquiring intracranial EEG (iEEG) patterns during a meditative state may provide more insight into understanding the physiology of meditation with less contamination of high-frequency muscle activity.

Methods

This study used an ABAB single case design to examine short-term, within-subject EEG differences between meditation and control conditions. iEEG data was recorded during a breath awareness meditation and an active control task (reminiscing) in the operating room during an awake craniotomy for tumor resection. iEEG was acquired using 4 x 5 subdural electrode strip (Ad-Tech Medical) placed over the left frontal lobe and recorded using a CortiQ (Guger Technologies) amplifier that digitized at a sampling rate of 1200 Hz with a 24-bit resolution. A Fast Fourier Transform was used to extract power from each segment in each condition. The FFT band export function was then used to export mean activity per spectral line, measured in power (uV^2) for theta (4-8 Hz), alpha (8-13 hz), beta (13-30 Hz), low gamma (30-50 Hz), and high gamma (70-120 Hz) bands.

Results

Visual analyses suggest that a brief breath awareness mediation was associated with increased theta, alpha, and beta power acquired from iEEG when compared to the control phase. No consistent effects were found with low gamma or high gamma activity. Paired sample *t* tests provided additional evidence that meditation may be associated with signficant change in theta, alpha, and beta spectral power.

Conclusions

Increased alpha and theta activity are consistent with prior published studies of meditators. Gamma activity recorded directly from cortex is established as a marker of cortical activation, although most gamma activity recorded from the scalp is related to muscle artifact. Although increased gamma activity and synchrony in scalp EEG during meditation in a practitioner who was more expert than ours has been observed and is possibly of cortical origin, more sophisticated analyses are needed to confirm that finding.

269) Abstract 1460

CHANGES IN FLOW, HEART RATE VARIABILITY, HEART RATE, AND RESPIRATION DURING SUFI WHIRLING DERVISH AND ITS IMPLICATION FOR HEALTH AND WELLBEING

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Background. Sufi Whirling Dervish (SWD) has been minimally studied to date and is a unique Islamic, Sufi ritual, of self-pivoting on the left foot, counterclockwise in a constant rhythm. This study aim was to empirically examine the effect of SWD on psychological and physiological indicators of well-being and its influence on body-mind. **Methods.** 44 adults participated in a cross-over repeated measures experimental design study alongside creative writing to gage emotional response. Participants engaged in group sessions of SWD and Zikr (circular moving group ritual, control condition) for 8 minutes each. Sessions' order was randomized and counterbalanced (to reduce order bias). Heart rate, heart rate variability, and respiration were measured at rest and continuously during the two experimental conditions using a portable ECG (Biopatch; Zephyr, USA). Flow was estimated using the Flow State Scale. Following the SWD participants were asked to use creative writing, regarding their experience of the SWD ritual. Creative writing was analyzed hermeneutically using a phenomenological analysis of themes. **Results.** Repeated measures ANOVA and post-hoc pairwise comparisons (with Bonferroni correction) revealed a differential effect of whirling condition on physiological measures. Heart rate was significantly high during SWD compared to baseline and Zikr, yet respiration rate during SWD was not significantly different compared to Zikr. High-frequency heart rate variability (RSA) significantly decreased during SWD compared to baseline and Zikr. Flow significantly increased after the SWD compared to baseline, but not compared to Zikr. A negative correlation was found between high frequency and low-frequency HRV during SWD and Zikr. The creative writing identified themes of a holistic operator (increased sense of being one with others and the universe and sense of bliss) and a whirling experience (Positive affect, psychological and physiological arousal and a body-mind self-regulation), pointing to a self-care wellbeing experience. **Conclusions.** SWD may promote a state of body-mind focusing, increased flow, and a holistic state of mind in which there is an increased balance between the parasympathetic and sympathetic nervous systems, which may contribute to increased

wellbeing. **Keywords:** Sufi whirling dervish, heart rate variability, respiration, wellbeing.

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270) Abstract 1792

OPEN- AND CLOSED-LABEL NOCEBO AND PLACEBO VERBAL SUGGESTIONS REGARDING A SHAM TRANSDERMAL CAFFEINE PATCH: EFFECTS ON ITCH

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Background: Negative and positive outcome expectations can be induced by providing information regarding an inert treatment method, which can in turn influence itch sensations (i.e. nocebo and placebo effects). In addition, there is accumulating evidence that such effects can be elicited when it is known that an inert treatment method is provided (open-label). However, few studies have investigated the efficacy of open-label nocebo and placebo induction by verbal suggestions on itch specifically, nor how these effects compare to closed-label (i.e. concealed) nocebo and placebo induction. Demonstrating these effects may lead towards new treatment possibilities for itch.

Methods: A randomized between-subjects study design was applied. Healthy volunteers (n=112) were randomly assigned to 1) a closed-label negative verbal suggestions group, 2) an open-label negative verbal suggestions group, 3) a closed-label positive verbal suggestions group, or 4) an open-label positive verbal suggestions group, and were invited for a single laboratory session. Participants were told that a transdermal caffeine patch would be applied, which would positively influence cognitive capabilities (e.g., attention span) and would moreover, as a side effect, positively or negatively (depending on group allocation) influence their sensitivity towards physical sensations such as itch. Participants in the open-label groups were given an explanation of the placebo or nocebo effect. Itch was induced experimentally at baseline and following open- or closed-label verbal suggestions by histamine iontophoresis. As part of the cover story for the suggestions, both histamine applications were followed by cognitive tests (e.g., the Stroop test). Outcome measures include expectations, self-reported itch, and skin responses to histamine application. We expect lower itch expectations and lower self-reported itch during iontophoresis in the positive verbal suggestions groups compared to the negative verbal suggestions groups under both open-label and closed-label conditions.

Results: Data collection for the project will be finished in December 2018 and the results will be presented during the conference.

271) Abstract 1537

DO PARTICIPANT CHARACTERISTICS PREDICT BP OUTCOMES FOLLOWING MINDFULNESS TRAINING?

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Introduction. The 8-week Mindfulness-Based Stress Reduction (MBSR) program consistently reduces self-reported stress, yet there is mixed evidence for an effect on physiological indicators of stress, such as blood pressure (BP). Baseline characteristics, such as trait mindfulness, stress symptom severity, negative affect, sleep quality, and cognitive function, may affect the extent to which a participant benefits from MBSR training. Therefore, we hypothesized that MBSR reduces BP at rest, lowers BP reactivity to an acute stressor, and promotes BP recovery after a stressor. We also hypothesized that, controlling for covariates often associated with BP (e.g., age, gender, and BMI), baseline status significantly predicts BP change following MBSR. **Methods.** In an open trial at an academic medical center, healthy adults (n = 64; 67% female; 84% white; age 22-64; mean [SD] BMI = 23.2 [2.58]) took part in laboratory stress testing sessions before and after an MBSR program. Participants completed survey measures after which their baseline BP was measured and they experienced an Anger Recall Interview stressor. Mean BP scores were derived by taking the average of five readings at 1-min intervals during each phase of the task (baseline, acute stress, recovery). The mean difference between pre-post MBSR baseline, stress, and recovery periods, respectively, were compared using paired t-tests. Hierarchical multiple regression models were then used to test predictors of mean BP change scores. **Results.** Resting baseline BP (SBP: $t(55)=-2.372$, $p=.021$; DBP: $t(55)=-2.203$, $p=.032$) as well as BP recovery after acute stress (SBP: $t(55)=-3.278$, $p=.002$; DBP: $t(55)=-4.202$, $p=.000$) improved significantly following MBSR. In addition, there was a trend toward lower BP reactivity (SBP: $t(55)=-1.781$, $p=.080$; DBP: $t(55)=-1.795$, $p=.078$). Neither baseline mindfulness scores nor any other baseline characteristics predicted MBSR-related changes in BP. **Conclusions.** Lower BP after participating in MBSR does not appear to be impacted by individual differences in key demographic factors or psychosocial variables. These results, observed in a generally healthy yet stressed sample, suggest that BP changes -- an objective, clinically relevant physiological marker of stress -- are robust across different types of individuals enrolled in an MBSR program.

272) Abstract 1573

CARDIOVASCULAR AND AUTONOMIC RESPONSES TO LEFT AND RIGHT UNILATERAL NOSTRIL BREATHING

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Background: Unilateral nostril breathing (UNB) is a widely applied breathing technique. A number of studies have shown the influence of UNB on autonomic activity, mainly increasing cardiac vagal activity and reducing blood pressure. Also, few studies have shown differential effects of breathing via left or right nostril, with the left UNB being associated with more cardiac vagal activity. However, the results of previous studies have not been consistent and no study has evaluated the effect of UNB on baroreflex function. We aim to compare the influence of left and right UNB with regards to cardiovascular and autonomic responses. We hypothesize that, compared to the right UNB, the left UNB is associated with higher cardiac vagal activity and baroreflex sensitivity.

Methods: This experiment was conducted on 30 healthy volunteers (15 female, age range 18-40 years) with a within-subject study design. Participants performed left and right unilateral nostril breathing at frequency of 0.1 Hz, each for three minutes. Control baseline condition was paced breathing at frequency of 0.23 Hz. Heart rate, beat to beat blood pressure, and skin conductance were continuously monitored. Time domain and spectral heart rate variability analyses will be performed to evaluate cardiac autonomic responses to UNB. Baroreflex sensitivity will be measured using the spontaneous sequence method as well as the spectral method using transfer function analysis. Peripheral vascular resistance will be measured using the Modelflow method. Skin conductance level and non-specific responses will be measured as indexes of sympathetic response.

Results: Data analyses are yet to be completed.

Conclusions: Data from this study can be used to develop and improve breathing techniques as non-pharmacological interventions for medical conditions in which modulation of autonomic activity can be beneficial such as hypertension and pain.

273) Abstract 1606

EFFECTS OF RECUMBENT ISOMETRIC YOGA ON PATIENTS WITH MYALGIC ENCEPHALPMYELITIS/CHRONIC FATIGUE SYNDROME: A RANDOMIZED, CONTROLLED TRIAL

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Background: In our previous randomized controlled trial, seated isometric yoga reduced fatigue in patients with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS). However, some ME/CFS patients were too severe to practice seated isometric yoga. To date, therapeutic strategies for severe patients have not been established. Therefore, we developed a recumbent isometric yoga program for patients with severe ME/CFS. The aim of this study was to investigate the efficacy of recumbent isometric yoga in patients with ME/CFS including severe patients who could not practice seated isometric yoga in a randomized, controlled trial.

Methods: This trial enrolled 50 patients with ME/CFS who did not have satisfactory improvement after receiving conventional therapy for at least three months. They were randomly divided into two groups and were treated with either conventional pharmacotherapy (control group, n=25) or conventional therapy together with recumbent isometric yoga practice, which consisted of biweekly, 20-minute sessions with a yoga instructor and daily in-home sessions (yoga group, n=25) for approximately three months. Severity of fatigue was assessed by the Chalder's fatigue scale (FS) scores. Adverse events and changes in subjective symptoms were recorded for subjects in the yoga group.

Results: In both groups, 24 out of 25 participants completed the intervention. The Chalder FS score decreased in both groups. However, yoga group showed more significant reduction than control group (-5.3±4.8 in the yoga group vs -1.8±3.3 in the control group, $p<0.01$). Subgroup analysis demonstrated that, in the yoga group, recumbent isometric yoga decreased Chalder FS scores in severe patients (n=14), too. Furthermore, yoga intervention also reduced Chalder FS score in patients with ME/CFS and comorbid fibromyalgia (n=6). There were no serious adverse events in the yoga group. No patients reported post-exertional malaise.

Conclusions: The present study suggests that recumbent isometric yoga is a beneficial adjunctive therapy for patients with ME/CFS, including severe patients and patients with comorbid fibromyalgia.

Trial registration: University Hospital Medical Information Network (UMIN CTR) UMIN000023472 (Registered Aug. 4, 2016) and UMIN000030051 (Registered Nov. 20, 2017).

274) Abstract 1071

MINDFULNESS BASED STRESS REDUCTION FOR OLDER COUPLES WITH METABOLIC SYNDROME

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Metabolic syndrome affects many older adults and increases risk for cardiovascular disease and diabetes. Metabolic syndrome consists of 3 of the following: abdominal obesity, hypertension, hypertriglyceridemia, elevated low-density lipoprotein cholesterol, and high fasting glucose levels. Although stress affects metabolic syndrome biomarkers, there are no stress reduction interventions for older adults with metabolic syndrome. As partners' health behaviors are interdependent, treating older couples is more effective than treating individuals. We examined the effectiveness of Mindfulness Based Stress Reduction (MBSR), an 8-week standardized mindfulness meditation program, in older married couples (60 years or older) with metabolic syndrome (one or both partners had metabolic syndrome). It was a pilot randomized control and feasibility trial, testing the hypothesis that MBSR (6 couples) compared to a wait-list control group (WLC; 6 couples) would have larger decreases in perceived stress and biomarkers (blood pressure, cholesterol, triglycerides, fasting glucose, and waist circumference) from baseline to post intervention and at 3-months. Second, we tested the hypothesis that MBSR compared to WLC would have greater increases in mindfulness, physical and psychological functioning, and relationship satisfaction. Third, we examined sex differences. Changes in outcomes as a function of time (baseline v. post-intervention v. follow-up) and intervention (MBSR v. WLC) were modeled using SAS/STAT 13.1 (PROC MIXED) to perform maximum likelihood estimation in linear mixed models. Sex was added as a moderator. Four MBSR couples attended all 10 sessions, one couple attended 7, and one couple attended 6. All MBSR couples reported the intervention useful and daily practice attainable. Follow-up biomarker data were missing for one MBSR couple and one WLC wife; all self-report data were complete. As hypothesized, MBSR wives had significantly greater increases in physical functioning ($F(2,36) = 3.27$, $p = .049$) and relationship satisfaction ($F(2,36) = 4.45$, $p = .018$) than WLC wives; there were no differences for husbands. However, stress, biomarkers, psychological health, and mindfulness were not significantly changed. Engaging in MBSR as a couple may be beneficial for older wives coping with metabolic syndrome by increasing physical functioning and relationship satisfaction.

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275) Abstract 1623

BREATH ATTENTION MEDITATION ENHANCES PARASYMPATHETIC ACTIVITY AND INCREASES ANTI-INFLAMMATION MARKERS.

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Objective. Recent classification of hypertension has contributed to a soaring number of newly diagnosed individuals with hypertension. Unfortunately, the thorny issue of how to successfully treat hypertension in youth remains unsolved. The issue becomes even more magnified because the traditional interventions (e.g., weight reduction, and diet) are not working as projected. This raises the danger of premature manifestation of cardiovascular disease especially in youth with positive family history of premature myocardial infarction. We hypothesize that Breath Attention Meditation (BAM) may enhance parasympathetic activity and contribute to the reversal of the autonomic nervous system (ANS) imbalance [i.e., increased SNS and parasympathetic nervous system (PNS) withdrawal]. Likewise, BAM will restore ANS balance through vagal stimulation and subsequent reversal of pro-inflammatory to anti-inflammatory status. **Method.** Heart rate variability and Flow cytometry analysis of peripheral blood from 5 hypertensive and 5 normotensive individuals were recorded at baseline and following 8 weeks of BAM. A combination of pro-inflammatory factors including CD3/IFNg/IL6 and a set of anti-inflammatory factors including FOXP3 (Tregs) and IL-10 were used to assess the status of immune changes. **Results.** In hypertensive patients following intervention High frequency (HF) and root mean square of successive differences (RMSSD) of normal RR intervals (RMSSD) trend upward while low frequency (LH) and LH/HF trend downward. At baseline, leukocytes (CD45+/CD11b+) were polarized towards an inflammatory status in hypertensive patients. Intervention (BAM) shifted the immune profile to be regulated towards an anti-inflammatory mode (Figure 1).

Conclusion. Non-pharmacological interventions such as BAM could be an important step to reverse autonomic imbalance and to promote

anti-inflammation status in hypertension, therefore, contribute to prevention of CVD.

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276) Abstract 1701

LIFETIME STRESS EXPOSURE, PERSONALITY, AND CARDIOVASCULAR HEALTH IN A COHORT OF NURSING STUDENTS

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Background: The deleterious effects of stress on cardiovascular health—and importance of factors that modify these effects—are well documented. Personality is considered a possible modifying factor, but pathways linking personality traits to cardiovascular disease (CVD) remain unclear. One possibility is that the characteristics of different personality types (e.g., hardiness, locus of control, self-efficacy, self-esteem, optimism, hostility, and negative affectivity and social inhibition) affect vulnerability and resilience to life stress. In this study, therefore, we tested this possibility using the Stress and Adversity Inventory, which assesses total lifetime stressor count and severity across different timepoints, life domains, and social-psychological characteristics.

Methods: Our goal was to examine interactions between Big Five personality traits and life stressors and their combined association with cardiovascular health. To do this, we tested interactions between lifetime stressor count and severity across multiple domains and personality, and their combined association with cardiovascular health endpoints [e.g., serum Fetuin-A (FA), amyloid P (SAP), CRP, TNFα, IL-1β, IL-6, and IL-8, as well as LDL, HDL, triglycerides, glucose, A1c, blood pressure, and carotid media thickness (CIMT)], in a cross-sectional study of 436 nursing students (80% female; 90% Hispanic; Mage= 25) via moderated multiple regression analyses that controlled for age, gender, and BMI. Interactions between lifetime stressor count and severity were assessed across tertiles of personality type scores.

Results: We found significant interactions between all five personality types (i.e., extraversion, emotional stability, conscientiousness, agreeableness, and openness) and multiple life stressors, including those related to health, housing, relationships, work, as well as acute and chronic stressor count and severity. The directionality of these interactions (protective vs. adverse) varied across health indicator. For instance, extraversion interacted with total lifetime stressor count to increase glucose (p =.016); while also interacting with chronic stress (p =.029) or relationship-related stress (p =.046) to lower IL-8.

Discussion: Personality and life stress interact and are associated with biological markers of CVD risk, but these effects differ across different types of stressors.

277) Abstract 1203

POST-TRAUMATIC STRESS SYMPTOMOLOGY AMONG EMERGENCY MEDICAL PERSONNEL: THE ROLE OF DAILY PERCEIVED STRESS AND RUMINATION.

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Background: Paramedics are frequently exposed to traumatic events on the job and report higher levels of posttraumatic stress symptoms (PTSS) than the general population (Berger et al., 2012, Petrie et al., 2018). Identifying factors associated with PTSS among persons frequently exposed to traumatic stress is important for the development of evidence-based interventions.

Methods: Eighty-seven shift-working paramedics completed a baseline questionnaire, a daily electronic diary for a one-week period, and a follow-up questionnaire two years later. Perceived stress and rumination were examined daily, while measurements of PTSS were assessed at baseline and two-year follow-up. Paramedics were required to be working full-time or the equivalent to full-time hours (minimum of four shifts a week). Participants were predominantly Caucasian (94%) and identified as male (82%). The mean age of participants was 42.09 (*SD* = 8.28, range = 27-62).

Results: Regression analyses indicated that daily stress was associated with daily rumination. In turn, daily rumination significantly predicted PTSS at the two-year follow-up, even after controlling for baseline PTSS, depression, and occupational stressors. Daily stress did not display a significant direct effect on PTSS at follow-up. Rather, as expected, daily rumination mediated the relationship between daily stress and PTSS. Specifically, higher levels of daily stress were associated with higher daily rumination, and higher rumination was associated with higher levels of PTSS at follow-up.

Conclusions: Our results suggest that daily stress and rumination may serve as important targets in clinical interventions for individuals who are frequently exposed to traumatic stressors at work.

278) Abstract 1317

TRAIT MINDFULNESS AND EMOTIONAL REACTIVITY: EXAMINING SELF-REPORT AND A CAFFEINE MANIPULATED EMOTIONAL TASK

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Background: Trait mindfulness is associated with reduced emotional reactivity (ER); however, most research has been correlational. In addition, the examination of individual facets of mindfulness and their interactions may better capture the 'what' and 'how' of mindfulness. In this study, we investigated the relationships between individual and interactive facets of mindfulness and self-reported ER. Within the same sample, we replicated these analyses using an ER task with a pharmacological manipulation (caffeine).

Methods: Healthy college students (N = 125; 81% F; 21.3 +/- 5.4 yrs) participated in a double-blind, placebo-controlled, two-visit caffeine manipulation study. Emotional stimuli from the International Affective Picture System (IAPS) were presented at both visits, and participants ranked how negative and positive each picture appeared. Participants completed self-report measures of emotional reactivity, including the Affect Intensity Measure and Perceived Stress Reactivity Scale. We tested main effects of the individual mindfulness facets from the Five Facet Mindfulness Questionnaire of *observing*, *acting with awareness (AWA)*, and *nonjudging* on self-reported and caffeine-manipulated reactivity, as well as the interactive effect of *AWA*and *nonjudging*.

Results: Using linear hierarchal regression, higher *observing* significantly predicted higher affect intensity, while greater *AWA* and *nonjudging* both significantly predicted lower affect intensity and perceived stress reactivity (p's < .05). The interaction between *AWA* and *nonjudging* did not significantly predict self-reported ER. *AWA* significantly interacted with *nonjudging* to predict change in negative ER (NER) between visits (p < .05); among those with higher levels of *nonjudging*, as *AWA* increased, NER decreased between visits.

Conclusions: Our findings suggest that higher trait mindfulness predicted lower self-reported and task manipulated ER. Caffeine did not increase reactivity to the emotional task in individuals higher in *AWA* and *nonjudging*, suggesting that higher levels of both facets are important for emotional stability under stress. These results highlight two important concepts: (1) both awareness and acceptance are important for the psychological benefits of mindfulness and (2) using an ER task yields critical insight over self-reported ER.

279) Abstract 1703

THE RELATIONSHIP BETWEEN SHAME, GUILT, AND DEPRESSIVE SYMPTOMS AND THE AMELIORATIVE ROLE OF SELF-COMPASSION AMONG LUNG CANCER PATIENTS

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Despite the common interchangeable use of shame and guilt, burgeoning research suggests there are fundamental differences between the two: shame refers to a global, negative feeling about the self, whereas guilt refers to a negative feeling (e.g., regret) toward a behavior. Shame has demonstrated a stronger relationship with depression than guilt, yet these relationships have not been clarified among lung cancer patients, a population highly susceptible to disease-related stigma. Identifying the self-blame emotional tendencies that predispose greater risk for depressive symptoms, a prognostic indicator in cancer, may be clinically informative. Thus, we hypothesized shame would have a stronger association with depressive symptoms than guilt. Due to the cognitive processes and related emotions underlying self-blame, we also hypothesized self-compassion would buffer against shame, guilt, and therefore depressive symptoms.

Lung cancer patients (N=60) were recruited within five years of a diagnosis. Patients reported on shame and guilt, depressive symptoms, and self-compassion. One hierarchical regression tested associations of shame (step one) and guilt (step two) with depressive symptoms. Three separate linear regressions tested the associations of self-compassion with shame, guilt, and depressive symptoms as dependent variables.

In line with our hypotheses, the best model to explain depressive symptoms included shame and excluded guilt (R^2=.224, β=.473, *p*=.000); guilt added minimal, statistically insignificant improvement to the model (R^2=.004; β=.077, *p*=.596). Results of the subsequent linear regressions indicated greater self-compassion was significantly associated with less shame (*p*=.016) and fewer depressive symptoms (*p*=.000), but not guilt (*p*=.236).

These results suggest that among lung cancer patients, shame and guilt are distinct constructs that relate differently to depressive symptoms. Because self-blame emotions are common in this context, interventions aimed at reducing shame and enhancing self-compassion may have a particular value.

280) Abstract 1020

RELATIONSHIP BETWEEN THE EXPERIENCE AND MANAGEMENT OF ANGER AND MENTAL STRESS IN A LARGE SAMPLE OF PSYCHOSOMATIC PATIENTS

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The connection between dealing with anger and mental stress is the subject of many studies. However, there is little research that more accurately captures the extent of connectivity in different disorders. We examined 1436 outpatients (mean age 38.4 years, 31% men) at the Psychosomatic Department of Bonn University Hospital by means of a sociodemographic questionnaire, the Symptom Checklist-90-R and the State Trait Anger Inventory. The relationship between mental stress as measured by the Global Severity Index and the scales of the STAXI was calculated using multiple linear regression. 46% (adj. R^2=0.46) of the variance in mental stress was explained by the STAXI, with the scales *state-anger* (β=0.341, p<0.001), *trait-anger* (β=0.244, p<0.001) and *anger-in* (0.323; p<0.001) as significant predictors. A sample subdivision by gender (women: adj.R^2=0.45, men: adj.R^2=0.47) or age (median split; ≤38 years: adj. R^2=0.43;> 38 years: adj.R^2=0.50) did not show any significant differences with regard to the amount of explained variance and significant predictors. However, a comparison of comorbidity-free disorder groups revealed clear differences. In posttraumatic stress disorder (adj.R^2=0.72) more than two-thirds of the variance of the Global Severity Index was explained by the STAXI, and in anxiety disorders (adj.R^2=0.51) about half of the variance. In eating disorders (adj.R^2=0.39), depression (adj.R^2=0.35), and somatoform disorders (adj.R^2=0.31) STAXI scales could predict markedly less variance. The study demonstrates the importance of *state-anger*, *trait-anger* and anger management for mental stress in psychosomatic patients in general and in post-traumatic stress disorder and anxiety disorder in particular. The experience and expression of anger in abovementioned disorders should be more focused in future studies in order to optimize diagnostics and therapy.

281) Abstract 1348

INTELLIGENCE, REPETITIVE THOUGHT, AND SYSTEMIC INFLAMMATION IN THE MIDLIFE IN THE UNITED STATES STUDY

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Background: Segerstrom, Reed, and Scott (2017) found that more repetitive thought (RT) was associated with lower levels of interleukin-6 (IL-6), an inflammatory marker, in older adults. This effect was particularly true at average (vs. high) IQ. This study aimed to replicate and extend the finding in sample with a larger range of age and IQ, with a daily measure of RT, and using more inflammatory markers (IL-6, CRP, TNF-α).

Method; Participants (*N* = 153) were drawn from de-identified, publicly-available data of the Midlife in the United States Refresher project. The sample included 153 participants, ages 25-70 (*M* = 45.07, *SD* = 10.96), 50.3% female, 71.2% married, and 83% Caucasian. Cognition was assessed via the Brief Test of Adult Cognition by Telephone, biological data were collected via fasted blood draw, and repetitive thought data were collected as part of the National Study of Daily Experiences 8-day daily diary. Two facets of RT were analyzed: total RT (total amount one engages in RT) and RT valence (positive vs. negative thought content). Biomarkers were log transformed and standardized.

Results: Neither a composite of the inflammatory biomarkers nor most individual biomarkers were significantly predicted by the interaction between IQ and total RT or RT valence. However, CRP was significantly predicted by the interaction between IQ and RT valence after adjusting for age, sex, and BMI (β =-.0.231 *p* = .003). There was a simple main effect of IQ where individuals with a high IQ (1 SD above mean) had lower CRP with more positive RT (β = -0.291, *p* = .01; see Figure).

Conclusions: Individuals at a higher IQ had significantly lower CRP when they engaged in more positive RT. This effect suggests that improving skills related to cognition may help improve health by helping one regulate content of thought. However, results did not replicate Segerstrom et al. (2017). It may be that fluid cognitive abilities and RT valence reflect a cognitive system related to executive functioning, where crystallized abilities and trait RT total may reflect a different system. There is also evidence that CRP may be related to changes in executive functioning, which may explain why this effect was only found in CRP. Future studies should continue to investigate cognition's effect on systemic inflammation as it may be a protective factor on an aging immune system.

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282) Abstract 1697

FURTHER UNDERSTANDING THE RELATIONSHIP BETWEEN VAGALLY MEDIATE HEART RATE VARIABILITY AND EMOTIONAL CLARITY

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Lower resting vagally mediated heart rate variability (HRV) has been shown to be associated with poorer function of neurophysiological pathways underlying emotion regulation. Emotional clarity can be defined as the extent to which a person can identify, differentiate, and understand one's emotions. Our group previously found an especially strong association between resting HRV and emotional clarity using the 36-item Difficulties in Emotion Regulation Scale (DERS; Williams et al., 2015). In the current study we elaborated on the association between resting HRV and emotional clarity measures by using multiple emotional clarity measures. We also split this association by sex given recent recommendations (Williams et al., *in press*). A 5-minute baseline period was used to first calculate resting HRV from 77 participants (39 females, mean age =19.97). HRV was calculated using the root mean square of successive differences in accordance with previously established guidelines (Task Force, 1996). Participants then completed both the DERS and the Trait Meta-Mood scale (TMMS); from these scales, emotional clarity was assessed via respective subscales. Results showed a weak and non-significant relationship between vmHRV and DERS-clarity ($r = .065$, $p = .574$) as well as vmHRV and TMMS-clarity ($r = .007$, $p = .951$). Interestingly, when split by sex, directional correlational test showed a significant positive association vmHRV and DERS-clarity ($r = .328$, $p = .021$) as well as vmHRV and TMMS-clarity ($r = .280$, $p = .042$) for females. The relationship between vmHRV and DERS-clarity ($r = .228$, $p = .084$) and TMMS-clarity ($r = .113$, $p = .250$) was weaker and not significant in males. These data extend our prior work and suggests that the association between resting HRV and emotional clarity is stronger in women than in men. Furthermore, this study continues to support the notion that sex may impact the association between resting HRV and facets of emotion regulation (Williams et al., in press). Future directions and limitations will be discussed.

283) Abstract 1068

IMPACT OF IMPLICIT EXPECTATIONS ON INTEROCEPTION IN PATIENTS WITH FIBROMYALGIA AND CHRONIC FATIGUE SYNDROME

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Background:

Allocating interoceptive sensations to categories creates categorical priors (implicit predictions) that subsequently impact interoception: within-category differences are perceived as smaller, differences between categories as greater (Petersen et al., Psychol. Sci., 2014). Because substantial evidence shows that the perception of the interoceptive sensations is often inaccurate, especially in patients suffering from functional symptoms, we hypothesized that patients would be more susceptible to the impact of categorical priors about sensations, especially to negatively valenced ones. We examined this hypothesis in patients with functional somatic syndromes, compared to healthy controls.

Methods:

60 patients with fibromyalgia and/or chronic fatigue syndrome and 30 healthy controls matched on gender, age, and educational level completed an Interoceptive Classification Task. In this task, 8 inspiratory resistances increasing with a constant factor (? = 0.32) are presented (POWERbreathe, International Ltd., Southam, UK). Participants first memorized specific category labels attributed to those resistances (low-intensity category: A1, A2, A3, A4; high-intensity category: B1, B2, B3, B4) and rated intensity and unpleasantness after each resistance (0-100 NRS). Next, participants themselves classified resistances by attributing a category label, and rated certainty about this decision.

Results:

Contrary to expectations, categorical priors did not have a greater impact on interoception in patients than healthy controls: all participants perceived differences in intensity and unpleasantness within the low-intensity category as smaller, and differences within the high-intensity category as greater than differences between categories. Categories were not discriminated better (i.e., classified more consistently in either category A or B), and the threshold to categorize resistances into the more negatively valenced category (B) was not lower in patients than in controls.

Discussion:

Patients did not differ from healthy controls as regards the impact of categorical priors on interoception. Possibly, presenting breathing sensations in a controlled lab context accompanied by instructions to pay close attention to them may wipe out differences between patients and healthy controls that may operate in everyday life in a patient group with joint pain and/or fatigue.

284) Abstract 1562

ALEXITHYMIA AND DEPRESSIVE SYMPTOMS INTERACT TO AFFECT CAFFEINE'S MODULATION OF EMOTION REACTIVITY: EVIDENCE FROM A DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

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Background: *Alexithymia,* the difficulty with/inability to identify, describe, and regulate one's own emotions and emotions of others, and *depression*, a state of mental and physical lethargy including increased irritability, lack of focus, and sleep and appetite disturbances, are related. However, it is an open question as to whether they are distinct constructs. Caffeine is the world's most widely used psychoactive drug with the potential to affect emotion processing and responses.

Methods: Healthy university students who used caffeine (*N*=97; 81% female, 21.6+5.7 years) participated in a double-blind, placebo-controlled study where they were asked to rate positive and negative stimuli from the International Affective Picture System. Participants also completed a variety of psychosocial, mood, and health questionnaires, including the Toronto Alexithymia scale and Center for Epidemiological Studies Depression scale.

Results: In absence of caffeine, among those with lower depressive symptoms, higher alexithymia levels were related to lower negative ratings of the negative photos ($p<.05$), whereas there was no relationship for those with higher depression levels. The pattern was not detected for positive photos. However, when examining the caffeine-induced emotional reactivity within a person, among individuals with elevated depressive symptoms, as alexithymia levels increased, their positive emotional reactivity increased ($p<.05$), meaning greater positive ratings at the caffeine visit. For those who reported lower depressive symptoms, alexithymia levels and positive emotional reactivity were not related. The interaction was not significance for negative emotion reactivity (NER), as depressive symptoms had a main effect and predicted NER ($p<.05$).

Conclusions: Our results suggest that caffeine exposure enabled individuals who reported both higher alexithymia and depressive symptoms to respond similarly as individuals who reported both lower alexithymia and depressive symptoms to positive photos, indicating that individuals with higher depressive symptoms and alexithymia could use caffeine to self-medicate. In addition, the significant interactions support the argument that depression and alexithymia are distinct constructs, especially in regards to rating emotion elicited via affective photos.

285) Abstract 1235

A NOVEL APPLICATION OF THE CENTRALITY OF EVENTS SCALE AFTER MINOR PHYSICAL INJURY: ASSOCIATIONS WITH POSTTRAUMATIC OUTCOMES AMONG INJURED EMERGENCY DEPARTMENT PATIENTS

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Background: Event centrality refers to the degree to which a stressful event is integrated into an individual's identity and serves as a

reference or turning point in the person's life (e.g., "this event has become a central part of my life story"). Although this construct is consistently related to posttraumatic stress symptoms (PTSS) and negative affect (i.e., depression and anxiety), extant research about its associations with posttraumatic outcomes after an acute physical injury (e.g., motor vehicle accident, falls, etc.) is sparse. We examined event centrality as a unique predictor of posttraumatic outcomes 6-weeks after minor physical injury. We hypothesized that event centrality would be positively associated with PTSS and negatively associated with quality of life (QOL).

Methods: We enrolled 149 injured adults in the emergency departments of two Level 1 trauma centers who reported serious injury and/or life threat < 24 hours prior. Subjects completed baseline surveys of past 2-week symptoms of PTSS, depression, anxiety, resilience, and peritraumatic dissociation. At 6-weeks post-injury, 85 patients (59% male; *M* age = 34) completed the Centrality of Events Scale (CES), the DSM-5 PTSD checklist (PCL), the 8-item Patient Health Questionnaire for depression, the Generalized Anxiety Disorder Scale for anxiety, and a Trauma-Specific QOL survey.

Results: Controlling for resilience, pre-injury PTSS, education, and peritraumatic dissociation, hierarchical regression analyses revealed a unique relationship between event centrality and PTSS at 6-weeks post-injury (B = 0.402, p< .001). These relationships were robust to controlling for concurrent depression and anxiety, and demographics (e.g., age, sex, time since injury, hospital admission). The CES was also uniquely associated with poor QOL at 6-weeks (B = -0.33, p < .01), above and beyond the effects of concurrent psychological symptoms and baseline factors.

Conclusion: Event centrality conveys important information 6-weeks post-injury and was associated with unique variance among posttraumatic outcomes. The CES is brief (7-items) and feasible to administer after injury to detect psychosocial symptoms and impairment. Future work is needed to determine the relationship between CES and posttraumatic growth among injured patients, and whether they view the struggle with injury as centrally positive or negative.

286) Abstract 1677

DO SELF-CONSCIOUS EMOTIONS EXPLAIN THE LINK BETWEEN PERFECTIONISM AND PERCEIVED STRESS?

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Associations between certain personality traits and physiological health are well documented. For example, higher levels of neuroticism are consistently found to be a risk factor for health problems because of its effect on stress. Though most of this research has focused on the "Big Five" personality traits, other personality traits, such as perfectionism, are also likely to influence health and wellbeing. Commonly conceptualized as a two-dimensional construct, perfectionism consists of a personal striving factor (PSP) and evaluative concerns factor (ECP). PSP is typically thought to be beneficial, leading to mental strength and happiness, whereas ECP has been linked with negative stress-related outcomes such as anxiety, depression, and even suicide. Although previous research highlights a strong link between perfectionism and stress, this link is not well understood. However, it has been theorized that negative self-conscious emotions (e.g., shame and guilt) may be critical mediating mechanisms. Thus, the present study examined shame-proneness and guilt-proneness as possible mediators in the perfectionism-stress relationship. Cross-sectional, self-report data from a community sample (n=216) was analyzed. Although bivariate correlations indicate that ECP is strongly related to perceived stress (r=.52) and that PSP is not (r=.03), a path analysis examining their *unique effects* on stress indicates that ECP and PSP each have significant, yet opposing effects on perceived stress. As predicted, ECP had a significant positive total effect on perceived stress (β=.60), composed of both a direct effect (β=.44) and indirect effect (β=.16) via shame. Guilt did not mediate this relationship. Second, PSP had a meaningful total negative effect on perceived stress (β=-.19), composed entirely of a direct effect. In contrast to ECP, shame did not mediate this relationship. Although PSP and guilt were related (β=.22), guilt did not mediate any relationship because of its nil effect on stress. A better understanding of how self-conscious emotions such as shame mediate the effects of perfectionism has important implications. Although perfectionism is thought to be a stable personality trait, it may be possible to employ interventions that target the mediating emotions by using strategies such as cognitive reappraisal or other emotional coping strategies.

287) Abstract 1671

LIFETIME STRESS EXPOSURE DURING ADULTHOOD IS ASSOCIATED WITH LOWER TRAIT-BASED EMOTIONAL INTELLIGENCE

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Background: Emotional Intelligence (EI) has been defined to index the degree to which emotion relates to function. Ability-based models conceptualize EI as a narrow construct defined by performance, while trait-based models theorize EI as a broader skillset and incorporate aspects of self-perception. Exposure to chronic or severe stress is related to decreased emotion regulation and can lead to decrements in the ability to perceive and understand emotions of the self and others. However, the relation between lifetime exposure to stress and adversity and EI has yet to be examined. We addressed this issue by examining how EI is associated with stress and adversity occurring over the entire lifespan. We hypothesized that individuals who experienced higher levels of lifetime stress exposure would have lower EI scores.

Methods: One hundred thirty-five healthy adults (48 men), ranging in age from 18-38 years old, completed the *Bar-On Emotional Quotient Inventory* (EQ-i), which assesses trait-based EI, along with the *Mayer-Salovey-Caruso Emotional Intelligence Test* (MSCEIT), which assesses ability-based EI. Participants also completed the *Stress and Adversity Inventory* (STRAIN), which measures an individual's cumulative exposure to stressors across multiple life domains over their lifespan.

Results: We found significant negative associations between lifetime stress exposure and EQ-i scores, specifically the number of stressors an individual was exposed to (β=-.29), as well as the severity of the stressors they experienced (β=-.28). These associations were independently driven by the amount (β=-.39) and severity (β=-.34*)* of stressors experienced in adulthood, while no associations between stress exposure during adolescence and EQ-i scores were observed. We did not find any significant relationships between lifetime stress exposure and ability-based EI scores.

Conclusions: As hypothesized, greater lifetime stress exposure was related to less EI. However, this relationship was limited to trait-based EI. These findings indicate the psychosocial impact of stress can have significant effects on perceived cognitive-emotional abilities, which may, in turn, have implications for human health. Further research work is necessary to examine if this association is malleable and whether enhanced stress management skills can facilitate subsequent increases in EI or vice versa.

288) Abstract 1527

ASSOCIATION BETWEEN SUBJECTIVE STRESS PERCEPTION AND VERBAL FLUENCY IN AN ACUTE STRESS SITUATION.

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Objective: The discussion whether acute stress experience has an adverse effect on cognitive performance is still ongoing. In this study,

divergent thinking in the context of acute stress was investigated. Divergent thinking is understood as a form of problem solving in which information obtained through an unsystematic, playful, and creative approach is first subjected to a subjective evaluation and then selectively used. Verbal fluency (VF) tests require the generation of word lists with a given first letter and are thus an indicator of divergent thinking ability. It was investigated whether VF performance differs before and after stress exposure and whether VF performance correlates with cortisol stress responses and subjective stress perception.
Method: 96 participants (44 female) were exposed to the socially-evaluated cold pressor test (SECPT). Immediately before (t1), after (t2), as well as 8 minutes after the SECPT (t3), a saliva sample was taken to measure cortisol. Subjective stress perception was recorded on a visual analogue scale (VAS) and VF was measured on these three time points as well.
Results: Cortisol response (defined as ≥ 10% increase from baseline after SECPT) was shown by 68 out of 96 participants. Cortisol responders rated perceived stress response slightly but not significantly higher than cortisol non-responders ($t(94) = 1.69$, $p = .09$). There were no differences in VF performance between time points ($F(2,190) = 23$, $p = .81$). It was found, however, that high subjective stress response was associated with diminished VF performance ($r = -.24$, $p = .02$*). When the total sample was divided into cortisol responders and non-responders, a significant correlation between subjective stress response and VF was found only in the cortisol non-responder group ($r = -.50$, $p = .007$**), but not in the cortisol responder group ($r = -.17$, $p = .17$).
Conclusion: Our results indicate that performance in VF could either vary independently of hypothalamic pituitary adrenal axis response, or depend on factors to be investigated in future studies, e.g. depend on reactions of the ANS. We conclude that the sample of non-responders may possibly be a hitherto underappreciated group in stress experiments.

289) Abstract 1477

MODERATING ROLE OF PERCEIVED STRESS ON ASSOCIATIONS AMONG MOOD AND EXECUTIVE FUNCTION IN OLDER ADULT CAREGIVERS OF A FAMILY MEMBER WITH DEMENTIA

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Background. Caregiving for a family member with dementia is a chronic stressor that can result in emotion dysregulation and depression. Notably, depressed mood over time contributes to the greater cognitive decline observed in caregivers relative to noncaregivers. Recent evidence suggests that stressor exposure affects cognitive change in caregivers through subjective stress. Thus, among nondepressed caregivers, individual variability in perceived stress may identify caregivers who may be most at risk for later depression-related cognitive decline. To explore this proposition, we examined whether perceived stress moderated associations between mood and executive function in nondepressed family caregivers. **Methods.** Eligible participants were caregivers of a family member with dementia, aged 55-85 years (n=66; mean age = 68.4; SD = 8.4), with elevated levels of perceived stress (Perceived Stress Scale > 11), and without elevated depressive symptoms (Geriatric Depression Scale < 15). We measured domains of executive function with Flanker (inhibition), Shifting (cognitive flexibility), and N-back (working memory) tests, and depressive symptoms using the Center for Epidemiologic Studies Depression Scale Revised (CES-D-R). Negative affect (NA) was measured using the Positive and Negative Affect Schedule (PANAS). **Results.** From linear regression models controlling for age, caregivers' greater perceived stress was associated with higher NA ($B = .01$, $p < .01$) and depressive symptoms ($B = .04$, $p < .01$). Caregivers who reported more NA performed worse on inhibition ($B = -1.69$, $p = .01$). Higher depressive symptoms were associated with lower scores of working memory ($B = -.41$, $p = .051$). Neither NA nor depressive symptoms were significantly associated with cognitive flexibility ($p > 0.05$). Perceived stress did not moderate the association of depressive symptoms with working memory (interaction p>.05). The interaction of perceived stress and NA for inhibition was significant ($p = .04$), however, where higher NA was associated with lower scores on inhibition only among caregivers who reported more perceived stress ($r_p = -.38$, $p = .03$). **Conclusion.** Results align with prior work on unique effects of negative affect and depressive symptoms on cognitive domains, and suggest further research on the interplay of stress and mood in pathways to caregivers' cognitive health outcomes.

291) Abstract 1681

ENGAGED WELL-BEING: A NEW CONCEPT FOR GOOD WORK IN THE DIGITAL ERA?

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Background: A variety of concepts has been employed to characterize adverse psychosocial work conditions, ranging from the job stain model over effort-reward-imbalance to concepts of organizational injustice. More recently the focus has shifted to understanding the relevance of resources such as purpose and enjoyment of one's work. Increasingly, desirable jobs are characterized where employees experience well-being and a sense of being inspired by their work. We aimed to operationalize this emerging concept of engaged well-being at work by using two well established scales for either construct and to elucidate psychosocial work characteristics prospectively predicting engaged well-being.
Methods: Population: Comprehensive structured telephone interviews in a three-wave representative longitudinal panel from the German working population (2012 n = 7,508, 2014 n = 7,282, 2016 n = 6,779). Of these, 1,227 participated in all three waves. Engagement was measured using the Utrecht Work Engagement Scale (Schaufeli and Bakker 2004). Well-being was operationalized by the WHO-5 (Bech et. al. 2003). Engaged well-being was defined as those scoring above the cut-off defining at-risk populations on either scale, the Top20 were defined as those scoring above the 60thpercentile on either scale. We assessed the factors predicting the change from being in one of the three other quadrants to engaged well-being in subsequent waves, or the change from within engaged well-being to Top20.
Results: Cross-sectionally, 48% were in the category of engaged well-being, containing the 50% Top20. 28% were disengaged well-being, 16% engaged with poor well-being, and 8% disengaged with poor well-being. In the three-wave longitudinal participants (n = 1,227), supportive leadership and positive organizational culture were positively associated with changing to engaged well-being (odds = 1.61), as were co-worker support (odds = 1.49), organizational fairness (odds = 1.34) and job autonomy and variety (odds = 1.30). High mental demands decreased the probability of changing into engaged well-being (odds = 0.74). To further change from engaged well-being to Top20, organizational fairness (odds = 1.65) and job autonomy and variety (odds = 1.34) were significant predictors.
Discussion: Engaged well-being provides an operationalization of "good work" as dependent variable of interest.

291) Abstract 1685

SF12 REVISITED: UNSATISFACTORY PSYCHOMETRICS WHEN ASSESSING WORKING POPULATIONS USING THE ORIGINAL ALGORITHMS?

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Background: The SF-12 is a popular survey to asses health related quality of life. The short form ensued from the eight dimensions 36 items survey (SF-36) developed by the RAND corporation. The original psychometrics used orthogonal rotation for uncorrelated mental and physical health summary scale. Several authors have challenged this assumption as many medically impairing conditions are also accompanied by mental comorbidity or symptoms. Second,

the original algorithm produces inexplainable results (i.e. low scores on the mental summary scale) for employees choosing answers consistent with high well-being on all items. The aim was to scrutinized the psychometric properties in a large sample of apparently healthy employees.

Methods: The SF-12 items were completed by 35,460 participants in the Mannheim Industrial Cohort Study (MICS). We conducted exploratory factor analyses, confirmatory factor analyses and tried to reproduce the suggested algorithm with a structural equation model assuming to uncorrelated main latent factors. Finally we subjected the two emerging latent constructs reflecting a mental and a physical summary scale to Item Response Theory Analysis (IRT, Stata 15).

Results: Exploratory factor analysis suggested two latent constructs with similar item association as in the proposed calculation algorithm. These were also supported by confirmatory factor analysis yielding good indices of fit. However, a structural equation model failed to support orthogonality of these latent factors (RMSEA = 0.14, CFI 0.82). Acceptable model fit was achieved when the two latent factors were allowed to correlate (r = 0.73, RMSEA = 0.06, CFI 0.98). IRT also suggested correlation of the latent constructs (r = 0.58) and revealed that items SF02 and SF03 discriminate only for poor physical well-being as rarely encountered in the working population. The by far highest information value was contributed by items SF04 and SF05, relating to impairment at work due to physical illness. Likewise, the highest information value for the mental latent construct was provided by items SF06 and SF07 inquiring about functional impairment due to mental problems.

Discussion: For use in working populations, we suggest a shorter version omitting uninformative items from the SF-12 and using a non-orthogonal algorithm to calculated mental and physical summary scores.

292) Abstract 1250

MENTAL, BEHAVIORAL, AND PHYSICAL HEALTH CORRELATES OF SELF-COMPASSION IN COLLEGE-AGED UNIVERSITY STUDENTS

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Introduction

An attitude of self-kindness, mindfulness, and a sense of common humanity, or self-compassion,[1] has been related to both physical and mental health and behaviors.[2,3,4,5,6] This study sought to replicate previous research and extend findings to additional constructs, including objective physical health biomarkers. As previous work has indicated associations between self-compassion and improved health behaviors,[2] it was hypothesized that higher self-compassion would be associated with healthier markers on all variables.

Methods

The sample (N = 94) was aged 19.46 ± 1.46, 78.7% female, and 77.7% Caucasian. Participants completed the Self-Compassion Scale (SCS), Patient Health Questionnaire 9 (PHQ-9), Perceived Stress Scale (PSS), Satisfaction with Life Scale (SWLS), Five Facet Mindfulness Questionnaire (FFMQ), Godin Leisure-Time Exercise Questionnaire (GLEQ), Pittsburgh Sleep Quality Index (PSQI), Starting the Conversation (STC) questionnaire, and an item about smoking history. Participants underwent a laboratory protocol which collected body fat percentage and ten minutes of baseline blood pressure, heart rate, and heart rate variability (HRV) measures (e.g., RMSSD and HF ms^2). Correlations between self-compassion and all variables were tested.

Results

The mean SCS score was 3.13 (*SD* = .71). All mental health variables were significantly associated with self-compassion in expected directions. Better sleep quality and higher systolic blood pressure were the only additional variables significantly associated with self-compassion. See Table 1 for correlation coefficients.

Discussion

Hypotheses were partially supported, but many variables were not associated with self-compassion. As previous research has indicated, self-compassion was associated with lower perceived stress and depressive symptoms and with higher satisfaction with life, mindfulness, and sleep quality. Contrary to our hypotheses, self-compassion was significantly positively associated with blood pressure. Self-compassion was not significantly related to healthy eating, exercise, smoking, body fat or physiological biomarkers (i.e., HRV, blood pressure). Only four students identified a history of smoking, and a low base rate may obscure findings. Health behaviors and biomarkers of health may be indirectly related to self-compassion, and future research should seek potential mechanisms.

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293) Abstract 1355

CREATIVE ARTS THERAPY FOR TRAUMATIZED ADOLESCENTS EXPOSED TO A SCHOOL SHOOTING: A PILOT STUDY

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Background: On February 14th, 2018, a gunman open-fired a semi-automatic weapon at Marjory Stoneman Douglas Highschool in Parkland, FL, killing seventeen students and staff members. Mass shootings have increased in the United States in recent decades and are associated with adverse psychological outcomes. This pilot study evaluates the effectiveness of a two-week creative arts therapy camp at improving the mental health status of adolescents exposed to the Parkland shooting.

Methods: This study used a pre-post design to evaluate a creative arts therapy intervention. Participants (n=44) were rising high school students enrolled in a two-week summer arts therapy camp, where they had the option of participating in visual art, drama, or music therapy. A questionnaire including the Patient Health Questionnaire 8-Item Scale, Generalized Anxiety Disorder 7-Item Scale, and Child's Reaction to Traumatic Events Scale were administered on the first and final days of the intervention.

Results: At baseline, a third of participants indicated clinically significant depression (31.8%), a third indicated clinically significant anxiety (31.8%), and nearly two thirds indicated high levels of posttraumatic stress (60.5%). There were statistically significant reductions in PTSD [mean difference=6.8, t(33)=3.08, p=.004], depression [mean difference=1.79, t(33)=2.25, p=.031], and anxiety symptoms [mean difference=2.4 , t(33)=3.26, p=.003] between pre- and post-intervention time points, with effect sizes between .38-.56. Drama therapy appeared to be the most effective of the three arts therapy approaches. Within the drama group, there was a significant decrease in PTSD symptoms [mean difference=8.67, t(8)=2.80, p=.023], anxiety symptoms [mean difference=5.33 t(9)=3.44, p=.007], and depressive symptoms [mean difference=5.03, t(9)=2.49, p=.034]. Symptom reductions within the music and visual art groups were not statistically significant.

Conclusion: Creative arts therapy appears to be a well-tolerated and age-appropriate intervention to improve the mental health status of traumatized adolescents. Students have the choice to engage with the trauma to the extent that they are ready. Of the three arts therapy types, drama therapy may be the most effective treatment to reduce anxiety, PTSD, and depressive symptoms in adolescents exposed to gun violence.

294) Abstract 1839

UNDERGRADUATES, EMPATHY, AND THE MEDICAL HUMANITIES: USING ART AND LITERATURE TO DEVELOP COGNITIVE EMPATHY IN PRE-CLINICAL EDUCATION

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Empathy has been linked to higher patient satisfaction, better adherence to therapy regimens and improved health outcomes. It has also been associated with greater physician satisfaction, less frequent burnout, and reduced malpractice liability. Pedagogically, empathy is often misunderstood or conflated with related concepts such as sympathy or compassion; as a result, common empathy-focused curriculum focuses on communication skills rather than cognitive skills.

Curriculum that emphasizes the subjective, lived experiences of patients through studying the humanities can overcome this limitation and develop the cognitive dimensions of empathy by challenging students to "see themselves" in the experiences of others.

We conduct a systematic review of literature on empathy-focused interventions which shows that interventions have typically focused on medical students rather than undergraduates preparing for health careers. This paper presents also pedagogy to introduce training at an earlier stage in the education of healthcare professionals that is designed to improve not only communication skills but also valuable cognitive empathic skills in the long-term.

295) Abstract 1716

COMPARING MULTIDIMENSIONAL FACETS OF STRESS WITH EMOTIONAL, SOCIAL, AND SUBJECTIVE WELL-BEING USING ECOLOGICAL MOMENTARY ASSESSMENT

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Stress is a multidimensional construct, including exposure to negative stimuli, subjective appraisals of stress, perceived coping abilities, and mental representations of stress in the form of rumination. Although research has shown each of these dimensions can predict poor emotional, social, and subjective well-being, rarely have these dimensions of stress been compared to each other, nor in an ecologically valid way as one is experiencing stress. The present paper used ecological momentary assessment to repeatedly measure stress dimensions and self-reported health, so as to test whether each stress dimension has a unique relationship with well-being over time. Participants (n =221, M age =19.8 years, 79.6% female) were Latino/a undergraduates, who completed ecological momentary assessments twice a day for 14 consecutive days. At each assessment, participants reported on exposure to stressors, subjective stress levels, perceived coping ability with stress, and levels of rumination. To measure health, participants reported on: levels of sadness, happiness, and anxiety (emotional well-being); feelings of loneliness, belongingness, and social interaction quality (social well-being); and how healthy they felt at the current moment (subjective well-being). Multilevel models were used and controlled for time-related factors. Each stress variable was person mean centered and entered as a predictor of the health variables tested separately. Subjective stress consistently predicted more negative emotional states (ps < .001), less positive social well-being (ps< .001), and worse subjective well-being (p < .001). Coping also predicted all variables (ps < .001) with relationships in the opposite direction of subjective stress. Rumination and stressor exposure had a similar pattern of effects, consistently predicting more negative emotional states (ps < .001) and worse subjective well-being (ps < .005). But they had inconsistent relationships with social well-being, with stressor exposure predicting less pleasant interactions (p = .002), but not loneliness or belongingness (ps > .270), and rumination predicting more loneliness (p < .001) but not belongingness or pleasantness of social interactions (ps > .298). Results suggest the importance of measuring stress in a multidimensional capacity and examining associations with well-being across multiple health facets.

296) Abstract 1304

SLEEP AND HEALTH AS POSITIVE CORRELATES FORGIVENESS OF OTHERS AND SELF-FORGIVENESS

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Background: The present study tested a mediation model of forgiveness of others, self-forgiveness, sleep, and health in a nationally representative sample of United States adults. Evidence supports the notion that sleep is a critical factor in support of good health. However, stress negatively impacts sleep quality and quantity. Because of their stress-reducing properties, forgiveness of others and of self might promote good sleep, and consequently, good health. Thus, it was hypothesized that sleep would mediate the association of forgiveness of others and self-forgiveness with health.

Methods: A nationally representative sample of 1,423 United States adults participated in a telephone survey. Measures included forgiveness of others, self-forgiveness, sleep quantity and quality, psychological distress, life satisfaction, self-rated physical health, and socio-demographics. Structural latent variable models with bootstrapping were used to test study hypotheses and examine the associations between forgiveness, sleep, and health. Models were adjusted for effects of sex, age, education, household income, race, and marital status.

Results: Forgiveness of others (β = .20, p < .001) and self-forgiveness (β = .11, p < .01) predicted sleep and forgiveness of others (β = .24, p < .001), and self-forgiveness (β = .27, p < .001) predicted health. Sleep predicted health (β = .45, p < .001) and also acted as a mediator of the associations of forgiveness of others (β = .09, p < .01) and self-forgiveness (β = .05, p < .01) with health.

Conclusions: The present study offers the first known examination of how forgiveness may be related to good sleep and thus, health. The findings suggest that forgiveness of others and self-forgiveness are both related to better sleep and sleep is, in turn, related to better health. Forgiveness of others and self-forgiveness may act to attenuate emotions such as anger, regret, and rumination and to provide a buffer between one's own and others' offenses occurring during the day and offer a restful mental state that supports sound sleep.

297) Abstract 1837

A SYSTEMATIC REVIEW OF INTERVENTIONS TO INCREASE EMPATHY AMONG MEDICAL SCHOOL STUDENTS

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Clinical empathy is a key clinical skill and core component of the patient-doctor relationship associated with benefits to both the patient and physician -- from improved clinical outcomes to higher satisfaction on the part of the both the patients and physicians. Yet a series of studies suggest a reduction in empathy among medical students and residents during their medical training. Interventions have been designed to try to prevent or reverse some of these declines.

Our systematic review looks at empathy-enhancing interventions that have been tested on medical students over the past seven years since the last similar review was published (Batt-Rawden et al. 2013). We conducted our literature search in PubMed using a search string of key terms and exclusion criteria. 730 titles were reviewed while 39 articles met the criteria for inclusion and analysis.

Our study demonstrated a continuing upward trend in the number of studies being published testing interventions to enhance empathy among medical students.

• Among the studies that met our criteria, the variety of interventions increased between 2012 and 2018.

• The success of communication skills training and empathy, ethics, and professionalism training in enhancing medical student empathy may be related to their focus on communication, which is fundamental to allowing patient-doctor understanding.

• Studies relied heavily onself-reported measures of empathy, rather than measures involving the perspective of patients or external observers. Given the body of research conceptualizing empathy as

deeply relational, it raises questions about the validity of using self-reporting instruments to measure clinical empathy.
• Efforts are becoming more rigorous in trying to establish the causal relationship between intervention and changes in empathy as demonstrated by the quality of the studies.

298) Abstract 1755
MINDFULNESS TRAINING INCREASES INTRINSIC CONNECTIVITY BETWEEN THE DEFAULT MODE AND FRONTOPARIETAL CONTROL NETWORKS: POSITIVE CONSEQUENCES FOR SELF-KINDNESS IN BREAST CANCER SURVIVORS
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Mindfulness training is suggested to be an effective strategy for reducing depression risk in breast cancer survivors. A recent study proposes that the beneficial effects of mindfulness training on health may be mediated, in part, by self-kindness, or a compassionate attitude towards the self in the face of suffering. While mindfulness and self-kindness have been repeatedly shown to be positive predictors of psychological health, the neural mechanisms underlying these factors are not well understood. Here, we use functional MRI to examine neural correlates of self-kindness following a standardized mindfulness meditation intervention for young breast cancer survivors (n = 20). Participants completed resting-state fMRI and questionnaires before and after the 6-week intervention, and completed questionnaires at a 3-month follow-up. We found that the mindfulness intervention resulted in increased functional connectivity between two large-scale intrinsic neural networks, the Frontoparietal Control Network (FPCN) and the Default Mode Network (DMN) ($t(19) = 2.16$, $p < .05$). The DMN is most consistently implicated in self-processing, and the FPCN is implicated in executive control; thus, results may potentially indicate increased top-down executive control of self-referential processes at rest. We also found that positive changes in connectivity between FPCN and the MPFC node of the DMN related to increased self-kindness at the 3-month follow-up compared to baseline ($b = .11$, $p < .05$). Overall, these results suggest that mindfulness training in younger breast cancers survivors may result in increased inter-network functional interactions and that these network-level changes are associated with positive consequences for thoughts and feelings about the self.

299) Abstract 1747
PRESENCE OF MEANING IN LIFE AS A STRESS BUFFER FOR CHRONIC ILLNESS PATIENTS
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Stress can significantly exacerbate health risks for chronic illness patients. While much research has been conducted on coping in response to stressor(s), less is known about overarching factors that may buffer the impact of stress for chronic illness patients. While experiencing life as meaningful--termed presence of meaning (PM) is typically associated with robust health benefits, search for meaning (SM)—how much one is striving to find meaning and understand their life—is typically associated with poor health outcomes. Given that people with chronic illness may be more susceptible to the influence of chronic stress, it is important to identify overarching factors which may reduce perceptions of stress.
The sample consisted of 57 people from three illness groups: Diabetes (n=19), Migraines (n=25), and Asthma (n=13). Mean age was 29.35(SD=16.54), and the sample was predominantly female (78.9%) and White (80.7%). Stress was measured with the Perceived Stress Scale (PSS-10; Cohen et al., 1988) and meaning was measured using the Meaning in Life Questionnaire (MLQ; Steger et al., 2006), which assesses both SM and PM.
Path analysis was conducted in Mplus 7.4 to estimate the direct effects of SM and PM and the interaction between SM and PM on perceived levels of stress for chronic illness patients. Results indicated that there was a direct effect of PM on perceived levels of stress ($\beta = -1.109$, SE = .37, p = .003) such that PM negatively and significantly predicted PSS. SM did not directly predict perceived levels of stress ($\beta = -.78$, SE = .55, p = .16). There was a significant interaction effect of PM x SM on perceived levels of stress ($\beta = .04$, SE = .02, p=.035).
Results of the study suggest that people with chronic illness who endorse high levels of PM perceive their lives as less stressful than those who endorse low levels of PM. This protective effect of PM holds for people who report low and high levels of SM. People with chronic illness who search for meaning, but do not find meaning in their lives may be particularly vulnerable to perceiving their lives as highly stressful. These findings support use of an intervention that bolsters meaning and helps people attend to existing sources of meaning in their lives (e.g., O'Donnell, Morse, Steger, in preparation) as PM may be especially beneficial as a stress buffer for individuals with chronic illness.

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300) Abstract 1110
COPING MECHANISMS TO STRESS ASSOCIATED WITH CARDIOMETABOLIC HEALTH MARKERS
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Prior literature has established the association between stress and cardiometabolic health (CMH) outcomes, with differential associations by gender as well as race suggesting the possibility that differential coping could account for the noted differences. We examine the association between coping behaviors and CMH within the Child Health and Development Studies (CHDS) Disparities (DISPAR) Study. Coping in response to general stress and unfair treatment were measured using a 9-item scale with negative (e.g. drinking alcohol) and positive (e.g. talking about the problem) coping subscales. Standardized negative and positive coping scores were calculated and ranged from 1-4 for both general stress and unfair treatment. A CMH index was developed based on five CMH markers: BMI, waist circumference, systolic and diastolic blood pressure, HDL cholesterol, and hemoglobin A1C. Each component was based on clinical cutoffs and/or medication usage. Scores were summed and the measure was dichotomized denoting individuals with two or more of the conditions acquired. Among the 454 participants, 51.1% of respondents acquired at least two of the conditions within the CMH index. Increased use of negative coping to unfair treatment was associated with an accumulation of at least two of the conditions within the CMH index [PR 1.22 CI95% 1.02, 1.46] and with increased obesity [PR 1.25 CI95% 1.01, 1.54]. There was a significant interaction between race and negative coping to unfair treatment and hypertension. Among White respondents, increased use of negative coping to general stress was associated with hypertension [PR 2.02 CI95% 1.30, 3.12] but this was not found among Black participants [PR 0.90 CI95% 0.67, 1.23], ($p < 0.05$ interaction). With respect to general stress among all participants, increased use of negative coping was associated with elevated waist circumference [PR 1.19 CI95% 1.003, 1.41]. A significant interaction between gender and negative coping to general stress and hypertension was noted. Increased use of

negative coping strategies to general stress was positively associated with hypertension among men [PR 1.27 CI95% 0.95, 1.70] and inversely associated with hypertension with women [PR 0.80 CI95% 0.63, 1.03), ($p < 0.05$ interaction). Findings suggest potential health impacts of negative coping may be stressor dependent and differential by race and gender.

301) Abstract 1332

IS LAUGHTER THE BEST MEDICINE? THE ASSOCIATIONS BETWEEN COPING STRATEGY USE AND CORTISOL AS MODERATED BY LEVEL OF POSTPARTUM DEPRESSION AMONG LOW-INCOME MOTHERS

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Recent findings suggest that use of specific coping strategies may differentially affect cortisol outcomes, yet, few studies have examined how level of postpartum depressive symptoms may moderate the relationship between coping use and cortisol. The current study examined whether use of different coping strategies (humor, active coping, denial, self-blame) were associated with cortisol levels and whether these associations differed by levels of postpartum depressive symptoms among low-income mothers. It was hypothesized that at low levels of postpartum depression, mothers who reported greater use of adaptive coping strategies, such as humor and active coping, would demonstrate lower cortisol, whereas mothers who reported greater use of maladaptive coping strategies, such as denial coping and self-blame, would demonstrate higher cortisol. Coping use was not expected to be associated with cortisol among mothers with high levels of postpartum depression. Our sample consisted of 78 low-income mothers (mean age=25+5 years) who completed questionnaires on coping use (COPE) and depression (EPDS), and also provided seven saliva samples on one collection day to assess for cortisol (AUC) at 3 months postpartum. Regression analyses showed that regardless of mothers' level of postpartum depression higher humor coping (β=-.515, p =.037) and self-blame coping (β= -.916, p =.051**)** was associated with lower levels of cortisol. In contrast with previous coping literature, active and denial coping were not found to be associated with cortisol. These findings expand the current state of coping knowledge by highlighting humor and self-blame coping as being associated with lower levels of cortisol, and therefore, have implications for the design and testing of behavioral interventions that teach coping strategies to manage stress among low-income mothers.

302) Abstract 1580

THE ASSOCIATION BETWEEN SLEEP QUALITY AND ANXIETY IN WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY: THE MODERATING ROLE OF COPING

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BACKGROUND: Sleep disturbances are associated with a range of negative mood and health outcomes, particularly in cancer populations. Use of maladaptive coping strategies during cancer treatment may exacerbate the effect of poor sleep on emotional and physical health outcomes. Understanding the impact of sleep and coping strategies on wellbeing following treatment for cancer may help inform interventions for patients undergoing active treatment.

METHODS: The current study is a secondary analysis of an RCT examining the effect of a Tibetan yoga program compared to a stretching program and usual care group for 227 women undergiong chemotherapy (CT) for breast cancer. Predictor variables included the self-reported Pittsburg Sleep Quality Index (PSQI) and actigraphy-assessed sleep (sleep efficiency (SE) scale), depression (CES-D), physical (SF-36 PCS) and mental (SF-36 MCS) health-related quality of life (QOL) assessed at baseline, midway through CT, at the end of CT, and 3 and 9 months post-CT. Moderator variables included baseline adaptive coping (use of emotional support, positive reframing, planning, active coping, religious coping) and maladaptive coping (denial, behavioral disengagement, venting) based on an exploratory factor analysis of the brief COPE. All analyses coveried for group assignment and randomization factors (stage of disease, type of surgery, CT regimen, timing of CT, menopausal status, age, and time since diagnosis).

RESULTS: Multilevel modeling revealed baseline PSQI was positively associated with anxiety (STAI-state, B=1.61, SE=0.53) and negatively associated with PCS (B--1.21, SE 0.23) and MCS (B=-0.55, SE=0.21) over the follow-up period (all p's <0.01). Baseline maladaptive coping moderated the effect of PSQI on PCS (p=0.02), such that the negative effect of poor baseline self-reported sleep (PSQI) on PCS over the follow-up period was greatest for women endorsing use of maladaptive coping. No other moderation effects were significant.

CONCLUSIONS: Poor sleep quality at the beginning of CT was associated with worse emotional and physical-health related outcomes during the 9 months following CT for breast cancer. Use of maladaptive coping strategies may exacerbate the effect of poor sleep on physical health related QOL.

303) Abstract 1759

TESTING THE MODERATING EFFECT OF COPING ON THE ASSOCIATION BETWEEN POSITIVE AND NEGATIVE AFFECT AND SELF-REPORTED HEALTH.

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Background: Self-reported health (SRH) is a relatively accurate way to assess health. Importantly, negative affect, which includes anxiety, depression, and hostility, has been known to increase the rate of illness and mortality, while positive affect is associated with reduced illness and mortality. Interestingly, positive coping strategies have also been shown to protect against negative health events, suggesting that coping could moderate the association between affect and SRH. While the unique effects of affect and coping on health has been demonstrated, it is unclear if coping style could increase the benefits of positive affect or decrease the harm of negative affect on SRH.

Methods: To test the moderating effects of coping on the association between affect and SRH, 103 participants completed a battery of questionnaires as part of a larger health behavior study. Participants (57% female) were normal, overweight and obese individuals between the ages of 18 and 58 (M= 28 (SD=8.4)). A moderated regression predicting SRH was conducted with control variables (age, sex, race & subjective socioeconomic status (SSS)) entered in Step 1, covariates (health locus of control, chronic condition diagnosis, loneliness) entered in Step 2, independent variables (positive and negative affect and coping) entered in Step 3, and the interaction between affect and coping entered into Step 4.

Results: Regression analyses revealed that age and SSS respectively had significant associations with SRH (*betas* = .26 and .31) and that loneliness had a trend association with SRH (*beta* = -.16). In addition, negative and positive affect respectively predicted SRH at significant (*beta* = -.31) and trend (*beta* = .19) levels, but coping was not associated with SRH. Moreover, coping did *not* moderate the association between negative or positive affect and SRH.

Conclusions: Results do not support the hypothesis that adaptive coping increases the benefits of positive affect and decrease the harm of negative affect in regards to SRH. As predicted negative affect is associated with lower levels of SRH, while positive affect is associated with higher levels of SRH. In addition, loneliness was associated with SRH at the trend level. Overall, results highlight the importance of

SSS, positive and negative affect, and loneliness on health perception in a predominantly overweight or obese sample.

304) Abstract 1598

MALADAPTIVE EMOTION-FOCUSED COPING AS A MODERATOR OF SLEEP QUALITY AMONG FIRST RESPONDERS

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Objectives: First responders frequently experience post-traumatic stress symptoms (PTSS) due to high levels of trauma exposure (Straud, Henderson, Vega, Black, & Van Hasselt, 2018). Frequent occurrences of PTSS correlate with a higher severity of sleep difficulties (Coloven, Drummond, Angkaw, & Norman, 2018). This study focuses on maladaptive emotion focused coping as a moderator between the relationship of PTSS and sleep. We hypothesized that the greater PTSS would predict reduced sleep quality, but that coping style would buffer this relationship. **Method:** Participants (n = 103) were recruited from two fire departments in the Pacific Northwest, and completed an online, self-report survey containing demographic information, the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013), Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989**),** and the Brief COPE (Carver, 1997). Analyses were conducted using the PROCESS Macro for SPSS (Hayes, 2013). **Results**: Of the four coping styles examined, only maladaptive emotional coping significantly moderated the relationship between PTSS and sleep quality (F [3, 99] = 28.92, p < .001). The relationship between PTSS and sleep quality was significant at one standard deviation below the mean for maladaptive coping (t [103] = 7.06, p < .001), at the mean (t [103] = 9.02, p < .001), and at one standard deviation above the mean (t [103] = 7.23, p < .001). The relationship lost significance at approximately three standard deviations above the mean (t [102] = 1.86, p = .07) and remained non-significant at the highest score in the sample (t [102] = 0.28, p = .78). **Conclusion**: These findings related to coping styles and sleep quality of first responders experiencing PTSS provide further data regarding the biological and psychological effects of trauma. The moderation of maladaptive emotional coping specifically implies that psychosocial interventions may influence sleep as a biological consequence of PTSS. Relative to other coping styles, engaging in maladaptive emotional coping appears to introduce additional sleep-related risks in this trauma-exposed population. Future research should investigate potential biopsychosocial secondary effects of sleep impairment in this group as well as opportunities for systemic- and personnel-level interventions that promote adaptive forms of emotional coping.

305) Abstract 1409

DIFFERENTIAL ASSOCIATIONS OF ADAPTIVE AND MALADAPTIVE COPING STRATEGIES WITH STRESS RESPONSE PATTERNS OF PLASMA IL-6 AND IL-6 GENE EXPRESSION

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BACKGROUND: Coping is thought to determine an individual's resiliency to stress and to relieve stress-related physiological dysregulation. While studied extensively with regard to biological stress system activation, regulatory effects of coping on immune-related processes that form a link between stress system activation and physical disease are not yet understood. The current study aimed to address this gap by examining the role of adaptive and maladaptive coping for stress and immune response patterns (i.e. response and habituation) in adults to gain a better understanding of how coping might affect physical health.

METHODS: Eighty-five participants (mean age = 24.84, *SD*= 6.22, 60.9% female) were exposed to the Trier Social Stress Test (TSST) on two consecutive days, and salivary cortisol and salivary alpha-amylase (sAA) were measured repeatedly before and after stress. In addition, plasma and RNA samples were collected from a subsample of 28 participants (mean age = 24.25, *SD* = 5.22, 53.6% female) in order to determine responses of plasma interleukin (IL)-6, and IL-6 gene expression to stress.

RESULTS: Hierarchical linear regression analyses revealed that adaptive and maladaptive coping were unrelated to both stress-induced increases and habituation of cortisol and sAA (p's < .05). However, higher reported use of adaptive coping strategies was found to predict greater plasma IL-6 habituation to repeated stress (β = .39, t(22) = 2.14, p = .04), while greater reported use of maladaptive coping strategies predicted stronger increases of IL-6 gene expression rates in response to stress (β = .49, t(21) = 2.65, p = .02). These results were independent of age, BMI, and sex.

CONCLUSIONS: Our results demonstrate associations between coping and pro-inflammatory immune responses to acute stress suggesting that cognitive, emotional, and behavioral styles of managing stressful events may be linked to the regulation of peripheral and intracellular immune responses to stress.

306) Abstract 1595

INTERACTIVE COPING: ADAPTIVE COPING MODERATES THE ASSOCIATION BETWEEN MALADAPTIVE COPING AND EMOTIONAL WELL-BEING.

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Coping has been conceptualized as a vital component in interventions to improve overall mental and physical health. Coping strategies such as planning, acceptance, and problem-solving are generally considered adaptive, typically leading to positive outcomes. In contrast, coping strategies such as self-distraction, denial, substance-use and self-blaming are generally considered maladaptive and associated with negative outcomes. However, recent research confirms that the "adaptive" strategies are sometimes associated with negative outcomes and "maladaptive" strategies are sometimes associated with positive outcomes. Findings such as these contraindicate the common view that coping strategies are either universally good or bad. One potential explanation for these "mixed" findings with respect to coping is that the various strategies might interact with each other. That is, rather than examining their effects in isolation from another, we believe it behooves researchers to consider how the simultaneous use of both types of strategies influence well-being outcomes. That is, it is unlikely that people engage in only one type of coping strategy at a time. Therefore, we explored the interaction between adaptive and maladaptive coping with emotional well-being as the outcome variable. Emotional well-being has been shown to be a significant and accurate predictor of overall mental and physical health and as such allowed us to test our hypothesis within a meaningful framework. We examined our hypotheses utilizing data collected via an online platform (Amazon Mechanical Turk) where 216 participants completed a series of self-report questionnaires. Employing multiple hierarchical regression, we found that as levels of adaptive coping increased, the negative effect of maladaptive coping on emotional well-being decreased. Essentially, this means that adaptive coping strategies were able to compensate for the negative effects from maladaptive coping strategies on emotional well-being. This finding highlights that intervention research and clinical practice may need to focus more on increasing adaptive coping strategies, and less on reducing maladaptive coping strategies. However, further research is needed to delineate which coping strategies specifically seem to be the most helpful when increased or improved upon.

307) Abstract 1138

EFFECTS OF POSITIVE AND NEGATIVE VERBAL SUGGESTIONS ON THE PSYCHOPHYSIOLOGICAL RESPONSE TO STRESS

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Background: Placebo and nocebo effects are known to affect a wide variety of psychological and physiological health parameters via expectations that can be induced by verbal suggestions. Furthermore, there are indications that verbal manipulations may have an effect on stress responses. However, whether verbal suggestions about stress responsiveness can induce expectations that influence the subjective and physiological responses to stress is currently unclear.

Method: A randomized single-blind experiment with a mixed between-within subjects design was conducted in 126 healthy volunteers. After receiving either a positive (n=41), negative (n=43) or no verbal suggestion (n=42) about their stress responsiveness, participants were exposed to the Trier Social Stress Test (TSST). Self-reported, autonomous and HPA-axis parameters were measured at baseline, during, and several times after the TSST. An emotional Stroop task was administered after the TSST to investigate effects on implicit cognitive processing.

Results: Preliminary analysis indicated that the negative verbal suggestion was significantly more convincing than the positive verbal suggestion, but both suggestions did not have a significant effect on expected stressfulness of the TSST. Regarding heart rate, the positive verbal suggestion led to a steeper increase in response to, and a larger recovery after the TSST compared to the negative suggestion and control group. No significant differences between the groups were found for the main outcome parameter cortisol or the other outcome measures.

Discussion: Although it was perceived as less convincing, the positive verbal suggestion affected the heart rate response to stress. This might indicate a dissociation between explicit expectations and automatic responses to stress, which may provide an interesting starting point for further research.

308) Abstract 1178

PHYSICAL HEALTH: THE PREDICTIVE ROLES OF NEUROTICISM, INTOLERANCE OF UNCERTAINTY, AND ANXIETY AND DEPRESSIVE SYMPTOMS

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The current proposal seeks to understand the pathways by which stable personality factors may influence acute mental health symptoms and ultimately confer physical health risk. The personality traits, neuroticism and intolerance of uncertainty (IU), are associated with physical health problems, somatic complaints, and increased risk of inflammation. People who are high in neuroticism and IU are more susceptible to anxiety and depressive disorders, and people with anxiety and depressive disorders report more physical ailments. We hypothesize that people who are high in neuroticism and IU are at significantly higher risk for poor physical health, especially when they endorse anxiety and depressive symptoms.

Data was collected from 514 undergraduate students (59% female; M_{age} = 19.91) at a large university. Physical health was modeled as a latent variable made up of five key indicators of subjective physical health (see figure). Structural equation modeling conducted in Mplus 7.4 was used to estimate the indirect effects of each predictor variable on the outcome using bias-corrected bootstrapped estimates of asymmetrical confidence intervals based on 1,000 bootstrapped samples, providing a powerful test of mediation. The path analysis resulted in adequate model fit. The Chi-Square test of model fit was significant ($\chi^2(21) = 249.00$, p <.001). Overall fit indices were all in the adequate range. All direct effects in the model were significant except for the direct effect of IU on physical health. Thus, neuroticism, depression, and anxiety significantly predicted physical health. All four indirect effects were also significant.

The present study showed that depression and anxiety symptoms mediate the effects of IU and neuroticism on physical health such that the effects of the mediators amplify the presence of neuroticism and IU on physical health. Being highly intolerant of uncertainty is not independently predictive of more physical health issues but rather IU is a health risk when it translates into acute mental health symptoms. Results of this study may inform future prevention efforts by identifying points of mental health intervention for people whose personality confers the most risk.

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309) Abstract 1488

PERSONALITY PREDICTORS OF CARDIOVASCULAR REACTIVITY TO A STRESS TASK

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Previous work from our laboratory demonstrated that neuroticism was associated with increased cardiovascular reactivity (CVR) to a mental arithmetic task during harassment (Stephenson et al., 2017). Specifically, higher levels of neuroticism were associated with increased diastolic blood pressure (DBP) and increased mean arterial pressure (MAP), and lower levels of openness to experience were associated with increased MAP during task completion. Although a negative association between extraversion and CVR was expected, it failed to reach significance. The current study sought to replicate this work with a sample of 152 undergraduates who completed a Raven's Matrices task without harassment. Multiple regression analyses were conducted on task CVR measures (covarying resting measures) to explore whether the Big 5 personality traits were predictive of several measures of CVR. Results revealed that SBP, $\beta = -.154$, $p < .01$, as well as MAP, $\beta = -.154$, $p < .05$, were significantly associated with decreased extraversion, and increased heart rate was associated with increased agreeableness, $\beta = -.123$, $p < .05$. No significant associations between neuroticism and CVR were observed. Although small effect sizes were associated with the negative relation between extraversion and CVR in both studies, the associations between neuroticism and CVR and inverse association between openness to experience and CVR were only detected in the initial study. These findings suggest that personality and CVR associations may be moderated by the task type employed to elicit reactivity. Neuroticism and less openness to experience may be linked with increased CVR, but only with sensory rejection tasks or when participants are harassed. The combined findings of both studies imply that mental reasoning tasks, but not sensory intake tasks, may be associated with increased reactivity in individuals higher in neuroticism, and that both mental reasoning and sensory intake tasks are associated with higher reactivity in individuals higher in introversion, but especially for sensory intake tasks. Although these findings seem to corroborate Eysenck's (1967) theory of arousal differences between extraverts and introverts, due to underlying differences in the ascending reticular activating system, future research should examine under what task conditions these differences are likely to be observed.

310) Abstract 1609

EXTRAVERSION IS ASSOCIATED WITH REDUCED HEART RATE REACTIVITY TO ACUTE LABORATORY STRESSORS IN HEALTHY ADULTS

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Extraversion, one of the Five Factor Model (FFM) personality traits, reflects a propensity toward sociability and positive emotionality. In previous research, individuals high in extraversion exhibited lesser heart rate and cortisol reactivity to acute psychological stressors than persons scoring lower on this dimension. However, these studies do not control for known correlated variation in other personality traits,

leaving open the question of whether extraversion independently predicts stress physiology. Thus, the current study investigates the association between extraversion and cardiovascular reactivity to acute laboratory stressors in healthy adults (N = 298; aged 44 ± 6.7 years) while controlling for the other FFM traits (Neuroticism, Agreeableness, Conscientiousness, Openness). All participants completed three stress paradigms: mirror tracing, Stroop, and a memory task. Heart rate and blood pressure were measured continuously prior to and during each task. A change score was calculated for each task (task – baseline), and converted to a z-score. Z-scores were averaged across tasks to compute an average reactivity score for each participant. Extraversion was assessed by the NEO Personality Inventory. Extraversion was significantly correlated with all other FFM traits (mean $|r|$ = 0.23; range $|r|$ = 0.13-0.38; all ps < 0.05). Extraversion was not associated with either systolic (β = 0.05, p = 0.79) or diastolic blood pressure reactivity (β = 0.016, p = 0.25). However, higher extraversion was associated with lower average heart rate reactivity while controlling for age, sex, race, body mass index, current smoking status, baseline heart rate, and all additional FFM traits (β = -0.148, p = 0.023). Indeed, extraversion was the sole trait predictor of heart rate reactivity (Neuroticism: β = 0.001, p = 0.098; Agreeableness: β = 0.033, p = 0.50; Conscientiousness: β = -0.094, p = 0.14; Openness: β = 0.064, p = 0.30). These findings extend prior evidence to suggest that extraversion is associated with cardiac, but not hemodynamic, responses to stressors, net the influence of other FFM traits.
Supported by NIH Grant P01HL040962

PAPERS

Ambulatory Blood Pressure
Friday, March 8 from 11:30 am to 12:30 pm

Abstract 1693
IS RUMINATION BAD FOR YOUR HEALTH? COMPARING TRAIT AND MOMENTARY ASSESSMENTS OF RUMINATION ON AMBULATORY BLOOD PRESSURE
Matthew J. Zawadzki, PhD, Psychological Sciences, University of California, Merced, Merced, CA
People high on trait rumination are at risk for poor cardiovascular health, including heightened blood pressure (BP) levels and hypertension. Yet, it is not clear why this individual difference is pernicious, namely how does being high on trait rumination influence one's in-the-moment ruminative behaviors and their effects on BP. This paper tested two complementary ideas by pairing a trait rumination assessment with repeated assessments of rumination behaviors in everyday life: (1) does trait rumination exert a continuous negative influence on BP, and (2) is the influence of momentary rumination on BP different for high versus low trait ruminators. Community participants (n = 291; 52.9% Male; M_{age} = 40.98; primarily 59.4% Black or 20.6% White) from the New York City area completed a baseline assessment of trait rumination. Next, participants completed two 24-hour monitoring sessions spaced two to four months apart that consisted of an ambulatory blood pressure reading taken every 30 minutes via a Spacelabs 90207 monitor, along with ecological momentary assessments of whether the participant was ruminating at each reading. Multilevel models examined the relationship of trait rumination, momentary rumination, and their interaction on ambulatory BP, while controlling for time of day, the participant's body position at each measurement, and age, sex, and race. A significant interaction effect emerged for systolic BP (p = .036). Follow-up analyses suggested that, as expected, those who had low levels of trait rumination had higher systolic BPs when they reported momentary rumination compared to moments without, suggesting a negative momentary effect of rumination for this group. Moreover, those with higher (vs. lower) levels of trait rumination also had higher systolic BP regardless of momentary ruminative behaviors, suggesting that high trait rumination is a risk factor for cardiovascular disease. However, those who had high trait levels of rumination actually had lower systolic BPs when they reported ruminating compared to moments of non-rumination, suggesting that rumination may actually serve as a coping resource for these individuals in-the-moment. Results simultaneously suggest rumination as a risk factor for cardiovascular disease while also highlighting a more complicated story when comparing state versus trait differences.

Abstract 1548
THE RELATIONSHIP BETWEEN TRAIT HOSTILITY AND AMBULATORY BLOOD PRESSURE AND MOMENTARY AFFECTIVE HEALTH VARIES BY LOCATION
Amanda K. Small, B.A., Matthew J. Zawadzki, PhD., Psychological Sciences, University of California, Merced, Merced, CA
Hostility is a risk factor for cardiovascular disease and all-cause mortality, but less is known about when hostility poses risk. Does hostility alter the way one interacts with the world around them, making some contexts more hazardous than others? This study uses ambulatory measurements to examine the effect of trait hostility and cynicism on blood pressure and affective health in individuals across work and non-work contexts. Community participants (n = 291; 52.9% Male; M_{age} = 40.98; primarily 59.4% Black or 20.6% White) completed the Cook-Medley Hostility Scale assessing trait hostility. Afterwards participants completed two 24-hour sessions spaced 2-4 months apart of ambulatory blood pressure (BP) monitoring using Spacelabs 90207 monitor. Accompanying each daytime BP reading were ratings of anger, sadness, happiness, and anxiety, and reports indicating work or other locations at the time of the reading. Multilevel models tested cross-level relationships between work location, trait hostility (total scale or cynicism subscale), and their interaction on BP and mood. A significant interact of cynicism and work context was found on systolic BP; participants with high and moderate cynicism had higher systolic BP at work compared to non-work context, while those with low cynicism showed the opposite relationships (b= .32, t(5250) = 1.98, p = .05). A significant interaction of hostility and work context was found on anger; participants with high hostility reported considerably higher angry mood at work compared to non-work contexts (b = .21, t(5250) = 2.95, p = .003). Also a significant interaction was found on sadness; participants with high and moderate hostility reported less sad mood in non-work contexts (b = .06, t(5250) = 3.06, p = .002). Although the work context is related to lower negative mood arousal and lower systolic BP for most, for individuals with high trait hostility, it is an environment of increased negative mood arousal and cardiovascular risk for those with high trait cynicism. Results provide insight how trait hostility and cynicism may prove damaging to health suggesting contexts with increased risk or protective aspects for people with higher trait levels.

Abstract 1643
LEISURE PROMOTES AMBULATORY BLOOD PRESSURE DIPPING: A WITHIN-PERSON RANDOMIZED FIELD EXPERIMENT
Marcellus M. Merritt, Ph.D., Psychology, University of Wisconsin Milwaukee, Milwaukee, WI, Matthew J. Zawadzki, Ph.D., Psychological Sciences, University of California, Merced, Merced, CA, Kayla T. Johnson, B.A., Michelle R. DiPaolo, Ph.D., Maryam Ayazi, M.A., Psychology, University of Wisconsin Milwaukee, Milwaukee, WI
Purpose. In healthy adults, blood pressure (BP) during daytime tends to be higher than BP at night, a phenomenon called BP dipping. An early indicator of future cardiovascular risk is a lack of nighttime BP decline (i.e., < 10% dip in BP from day to night). Thus, identifying when non-dipping occurs and intervening to promote dipping has potential to proactively prevent future disease, particularly among a younger population. Stress has been identified as a risk factor for cardiovascular disease, and stress management techniques have demonstrated potential protective cardiovascular benefits. One such technique that may be readily available to all individuals is engagement in self-selected leisure activities (or SSLAs) – intrinsically enjoyable, distracting, and self-enhancing recreational pursuits that occur during non-work time activities (e.g., riding a bicycle or reading a novel) – that have been shown related to daily BP control. As such, we hypothesized that there would be more nighttime BP decline on a day in which one does an SSLA, versus another day when not doing an SSLA. This study proposes a novel within-person field experiment to test leisure's health effects on BP dipping in everyday life.
Methods. Healthy young adults (n = 38; 78.9% female; 68.4% White) completed baseline psychosocial measures and then visited our psychophysiology laboratory twice within roughly one week. At each visit, participants were fitted with an Ambulo 2400 monitor that was used to collect in-the-field BP in the ensuing 24 hours. After one visit, participants were instructed to engage in a SSLA at a time of their choice before going to bed; after the other visit, participants were instructed to go about their day as usual with the exception of asking them to refrain from engaging in any leisure that day. Assignment to the SSLA or control days was counterbalanced across participants.
Results. Paired samples t-tests show (as expected) that more BP dipping on SSLA versus control days for both systolic BP (M = 16.05, SD = 1.08 vs. M = 13.09, SD = 1.32, p = .033) and diastolic BP (M = 15.71, SD = 1.19 vs. M = 10.73, SD = 1.50, p = .003).

Conclusions. Thus, SSLAs have the potential to be a protective factor against future cardiovascular disease, by way of an immediate BP dipping effect.

Abstract 1816

EXAMINING THE ASSOCIATIONS BETWEEN OBJECTIVE SLEEP AND AMBULATORY BLOOD PRESSURE IN A COMMUNITY SAMPLE OVER TIME

Caroline Y. Doyle, M.A., Psychology, Melissa Flores, PhD, Health Sciences and Psychology, University of Arizona, Tucson, AZ, Jessica Dietch, M.A., Daniel Taylor, PhD, Psychology, University of North Texas, Denton, TX, Chul Ahn, PhD, Clinical Sciences, UT Southwestern Medical Center, Dallas, TX, Matthew Allison, MD, Family Medicine and Public Health, UC San Diego, San Diego, CA, Timothy Smith, PhD, Psychology, University of Utah, Salt Lake City, UT, Joshua Smyth, PhD, Biobehavioral Health, The Pennsylvania State University, State College, PA, Bert Uchino, PhD, Psychology, University of Utah, Salt Lake City, UT, John Ruiz, PhD, Psychology, University of Arizona, Tucson, AZ

High blood pressure is a leading risk factor for overall disease burden, including cardiovascular disease (CVD). Likewise, emerging evidence suggests that various dimensions of sleep are uniquely associated with CV health. However, less is known about the pathways that underlie sleep and blood pressure (BP). With much of the current literature relying upon cross-sectional analyses and self-reported measures of sleep, there is a need for examining this association using methodologies that use multiple time points. Thus, the aim of this study is to examine the pathways that connect actigraphic sleep duration and efficiency with ambulatory BP over time.

Participants were a community sample of 300 healthy adults (150 men, 150 women) ages 21 to 70 years enrolled in the North Texas Heart Study (PI: Ruiz). The sample was stratified by age within gender and race/ethnicity, and the mean age at enrollment was 42.44 years (SD=12.76). Actigraphy using AW Spectrum Actiwatches were collected over a 48-hour period. Ambulatory Blood Pressure was collected at random times during 45-minute intervals over the corresponding 48-hour period. Person/day averages were calculated within day (7am to 10pm) and night (12am to 5am). This protocol was conducted twice: once at Time 1, and again two years later (Time 2).

With the broader goal of creating a hypothesis-driven path model that describes the relation between objective sleep and BP, we will analyze these data using the following systematic approach. (1) Using Time 2 data, replicate findings from Doyle et al. 2018 (under review) in which we found significant associations between lower sleep duration and efficiency and higher BP (2) Determine the extent to which BP and sleep from Time 1 respectively impact the relationship between sleep and BP at Time 2. (3) Explore whether sleep over time has a *compounding* effect on BP by examining the interaction between sleep at Time 1 and sleep at Time 2 on BP at Time 2. (4) Assess individual differences in stability of "good" and "poor" sleep over time. (5) These analyses will inform our hypotheses of the ways in which sleep and BP may influence each other over time. Mediators and moderators of these associations will be considered. The need for longitudinal studies utilizing objective measures to further explore the role of sleep in CVD risk will be discussed.

*Data analysis still in process

Biopsychology in Patient Populations
Friday, March 8 from 3:00 to 4:00 pm

Abstract 1674

DEVELOPMENT AND PSYCHOMETRIC EVALUATION OF THE PSYCHOSOCIAL SCREENING INSTRUMENT FOR ADULT TRAUMA PATIENTS (PSIT)

Maria Karabatzakis, MSc, Trauma Topcare, Elisabeth-Tweesteden Hospital, Tilburg, Netherlands, Brenda L. Den Oudsten, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Netherlands, Taco Gosens, MD, PhD, Department of Orthopedics and Traumatology, Elisabeth-Tweesteden Hospital, Tilburg, Netherlands, Jolanda De Vries, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Netherlands

Background: Psychosocial problems after injury are difficult to recognize. These problems can negatively affect quality of life. Screening may assist in early recognition of psychosocial problems, but currently there is no broad psychosocial screening instrument that can be used after injury. Therefore, we developed the Psychosocial Screening Instrument for adult Trauma patients (PSIT) and evaluated its psychometric properties.
Methods: First, a systematic review was conducted to generate a provisional item list containing psychosocial problems post-injury. Next, focus groups were organized with adults admitted to a Dutch level I trauma center (n=30) and health care professionals (n=12) to explore the psychosocial impact of injury and to ask which problems on the provisional item list are viewed most important. Based on these results, the PSIT was developed. Subsequently, 364 patients completed the PSIT and additional questionnaires measuring symptoms of depression (PHQ-9), anxiety (STAI-S), post-traumatic stress (PTSS) (IES-R), self-esteem (RSES), and quality of life (WHOQOL-Bref). Two weeks after inclusion, 128 participants completed the PSIT again. Then, the psychometric properties of the PSIT were assessed. Cut-off values were calculated and values with the highest sensitivity and specificity were chosen.
Results: The preliminary version of the PSIT contained 20 items. Due to high cross-loadings, five items were deleted after principal components analysis. Confirmatory factor analysis supported the final structure of the PSIT. The 15 items cover 3 subscales: Negative affect (7 items), Anxiety/PTSS (4 items), and Social and self-image (4 items). The intraclass correlation coefficient was 0.86. Cronbach's alpha coefficients were 0.91 (Negative affect), 0.77 (Anxiety/PTSS), and 0.88 (Social and self-image). Ten out of 12 (83.3%) a priori hypothesized correlations between the PSIT subscales and additional questionnaires were as expected. The cut-off values and corresponding sensitivity and specificity were: Negative affect≥7 (89.6%; 83.4%), Anxiety/PTSS≥3 (94.4%; 90.3%), Social and self-image≥4 (85.7%; 90.7%).
Conclusion: The PSIT is a reliable and valid 15-item instrument that can be used to screen for psychosocial problems among injured adults. Recently, a feasibility study has started to explore the possibility of adding the PSIT to standard trauma care.

Abstract 1773

C REACTIVE PROTEIN AND ITS ASSOCIATION WITH DEPRESSION IN PATIENTS RECEIVING TREATMENT FOR METASTATIC LUNG CANCER

Daniel McFarland, D.O., Psychiatry and Behavioral Sciences, Memorial Sloan Kettering Cancer Cener, New York, NY, Barry Rosenfeld, Ph.D., Psychology, Fordham University, Bronx, NY, Christian Nelson, Ph.D., Psychiatry and Behavioral Sciences, Memorial Sloan Kettering Cancer Cener, New York, NY, Andrew Miller, M.D., Psychiatry and Behavioral Sciences, Emory University, Atlanta, GA

Background: Depression is highly prevalent in lung cancer. While there is a known association between inflammation and depression, this relationship has not been examined in patients with lung cancer undergoing treatments with immune and other targeted drug

therapies. Peripheral blood C-reactive protein (CRP), a marker of systemic inflammation, may help identify metastatic lung cancer patients with inflammation-associated depression. **Methods**: Patients with metastatic lung cancer undergoing treatment were evaluated for depression using the Hospital Anxiety and Depression Scale (HADS). Inflammation (CRP and CRP cut-offs ≥1 and ≥3 mg/ml) and demographic and treatment variables were analyzed for association with depression. **Results**: One hundred and nine consecutive participants exhibited an average plasma CRP concentration of 1.79 mg/ml (SD 2.5; Median 0.75 mg/ml), and 20.7% had a CRP concentration of ≥3.0 mg/ml. 23.9% met depression screening criteria (HADS ≥8). A log transformation of CRP was significantly correlated with depression severity (r=0.47, p<0.001). CRP was the only covariate to predict depression severity (p=0.008) in a multivariate model including lung cancer disease subtype and type of systemic treatment. ROC analysis indicated that CRP had moderate predictive accuracy in identifying elevated depression (AUC=.74). A cut-off of CRP ≥ 3.0 generated high specificity (88%) but identified only 50% of those with elevated depression. **Conclusion:** Elevated CRP is associated with depression in patients with metastatic lung cancer. Thus, CRP may identify a subset of lung cancer patients with inflammation-induced depression and may be useful in predicting response to treatments that target inflammation or its downstream mediators on the brain.

VIEW PDF

Abstract 1319

ASSOCIATIONS OF ATYPICAL DEPRESSIVE SYMPTOMS WITH INSULIN RESISTANCE IN DEPRESSED PRIMARY CARE PATIENTS

Aubrey L. Shell, B.A., Jay S. Patel, M.S., Psychology, Indiana University-Purdue University, Indianapolis, Indianapolis, IN, Elizabeth A. Vrany, Ph.D., Division of General Internal Medicine, Johns Hopkins University, Baltimore, MD, Robert V. Considine, Ph.D., Anthony J. Acton, Jr., B.S., Medicine, Indiana University School of Medicine, Indianapolis, IN, Jesse C. Stewart, Ph.D., Psychology, Indiana University-Purdue University, Indianapolis, Indianapolis, IN

Depression is an emerging risk factor for type 2 diabetes. Recent studies examining depressive symptom clusters suggest that the somatic symptoms – including sleep and appetite disturbances – are more strongly associated with insulin resistance than the cognitive-affective symptoms. Another recent study found that atypical depression – characterized by the reversed somatic symptoms of hypersomnia (increased sleep) and hyperphagia (increased appetite/weight) – is more strongly associated with metabolic syndrome than the other depression subtypes. Our objective is to extend this literature by examining the associations of total depressive symptoms, hypersomnia, and hyperphagia with insulin resistance in depressed primary care patients. We analyzed baseline data from the ongoing eIMPACT depression trial (R01HL122245, NCT02458690). Specifically, we selected the 135 participants who were randomized by 8.15.17 and excluded those who reported a diabetes diagnosis at baseline (n=48) or had missing baseline data on key variables (n=9), leaving a final sample of 78 (age M=59 years, BMI M=33.25, 77% female, 51% non-Hispanic White). Total depressive symptoms, hypersomnia ("sleeping too much" item), and hyperphagia ("overeating" item) were assessed by the Hopkins Symptom Checklist (SCL-20; M=2.0 points, SD=0.7, range: 0-3.6), and insulin resistance was calculated from fasting glucose and insulin values using the HOMA2 calculator (M=2.3, SD=1.7). In the demographics-adjusted model (adjusted for age, sex, race/ethnicity, and education), neither total depressive symptoms (β=0.056, p=0.63) nor hypersomnia (β=0.034, p=0.77) were associated with insulin resistance; however, hyperphagia (β=0.343, p=0.005) was positively associated with insulin resistance. Further adjustment for BMI (a candidate mediator/confounder) attenuated the relationship between hyperphagia and insulin resistance (β=0.170, p=0.18), while adjustment for current smoking (β=0.336, p=0.006) and history of alcohol/substance use problem (β=0.354, p=0.004) did not. Our findings suggest that those with hyperphagia may be a subgroup of depressed patients at particularly elevated risk for insulin resistance and type 2 diabetes. Moreover, our findings highlight the importance of considering the direction (increase versus decrease) of somatic depressive symptoms when examining associations with diabetes risk markers.

Abstract 1621

CHANGES IN SALIVARY CORTISOL LEVELS IN PATIENTS WITH AN IMPLANTABLE CARDIOVERTER DEFIBRILLATOR: ASSOCIATIONS WITH CLINICAL CHARACTERISTICS AND DEPRESSIVE SYMPTOMS.

Willem J. Kop, Ph.D., Mirela Habibovic, Ph.D., Dounya Schoormans, Ph.D., Paula M. Mommersteeg, Ph.D., Medical & Clinical Psychology: CoRPS, Tilburg University, Tilburg, Netherlands, MJM DeGroot, Ph.D., Clinical Chemistry, Elisabeth-TweeSteden Hospital, Tilburg, Netherlands, Susanne S. Pedersen, Ph.D., Psychology, University of Southern Denmark, Odense, Denmark

BACKGROUND: Implantable cardioverter defibrillator (ICD) therapy is the first line of treatment for life-threatening cardiac arrhythmias. In ICD patients, depression and other types of prolonged psychological distress are associated with poor outcomes (ventricular tachyarrhythmias and mortality). Little is known about the biobehavioral processes involved. The present study examined longitudinal changes in cortisol levels in ICD patients and whether depressive symptoms were associated with elevated cortisol levels.

METHODS: Ambulatory cortisol levels were assessed in participants of the Web-based Distress Management Program for Implantable Cardioverter Defibrillator (WEBCARE) trial (mean age=59.2±10.1 years, 19% women). Cortisol was measured from saliva samples on two consecutive days within two weeks after ICD implantation: upon awakening, after 30 min, 3 PM, and 9 PM. Parallel follow-up measurements were done at 3 and 12 months. Cortisol assays were performed using ECLIA. Clinical information was obtained from medical records and depressive symptoms were assessed using the Patient Health Questionnaire-9. Changes over time were examined using general linear models with repeated measures.

RESULTS: Cortisol levels declined during the day (p<.001), but the post-awakening increase was not observed in this study (p>.10). Aggregate levels (AUC) remained stable from post-implantation until 12 months follow-up, and no differences in cortisol levels were found between participants in the active treatment (N=138) versus the usual care condition (N=131; p values >.20). Patients with a primary prevention ICD indication had higher end-of-day cortisol levels post-implantation than patients with a secondary prevention indication (8.50±0.57 vs. 6.28±0.47 nmol/L; p=.003) and this difference disappeared during follow-up. Depressive symptom severity was not correlated with cortisol levels (r values <0.15, p>.05).

CONCLUSIONS: No long-term changes in cortisol levels were found in ICD patients during 12 months' follow-up nor were cortisol levels correlated with depression scores. It is possible that the underlying etiology and indication for the ICD (primary vs. secondary) influence biobehavioral processes in ICD recipients relevant to prognosis. Future studies are needed to further disentangle biological and psychological predictors of prognosis in high-risk patients.

Cancer
Saturday, March 9 from 1:45 to 3:15 pm

Abstract 1437
RURAL RESIDENCE IS RELATED TO POORER QUALITY OF LIFE AND SHORTER SURVIVAL IN EPITHELIAL OVARIAN CANCER PATIENTS

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Background: Rural residence has been related to health disparities and greater mortality risk in cancer patients. However, little is known about these factors in ovarian cancer. We examined relationships of rural residence to psychosocial outcomes and survival in 428 epithelial ovarian cancer patients seen at tertiary cancer centers in Iowa and Missouri.

Methods: Patients completed psychosocial surveys pre-surgery and at one-year post surgery; clinical and demographic data were obtained from medical records. Urban/rural residence was categorized from patient zip codes using the USDA Rural-Urban Continuum Codes (RUCC 1-3 vs. 4-9).

Results: 42.2% of Iowa and 32.1% of Missouri patients were rural. Cox regression analyses, adjusting for age and clinical covariates (stage, grade, BMI, cytoreduction, histology, neoadjuvant treatment) indicated that rural residence was related to a lower likelihood of survival HR=1.45 [CI=1.04-1.97] p=0.029; rural by site interactions were n.s. Rural patients had significantly lower education and income (p's <0.001); secondary analyses adjusting for these variables resulted in lower HRs (education: HR=1.36 [CI=.96-1.92] p=0.081; income: HR=1.28 [CI=.88-1.84] p=0.198), suggesting a possible influence of these factors. Pre-surgery there were no differences in psychosocial variables in rural vs. urban patients (all p's > 0.62). At one year rural patients had greater distress (POMS: p=0.014), depression (CESD: p=0.022), and poorer quality of life (QOL; FACT: p=0.008) than urban patients, but no differences in social support (p=0.206), adjusting for education and income. Significant rural X site interaction effects were observed for QOL and depression at one year (p<.05); adjusting for income and education, rural Iowa patients had greater depression (12.59 vs. 8.58; p=0.025) and poorer QOL (79.24 vs. 87.29; p=0.001) than urban patients; these differences were not seen in Missouri patients.

Conclusions: Rurality is associated with worse mood and QOL at one year and potentially with mortality in ovarian cancer patients. Rurality effects may vary in different locations, possibly depending on local resources. Clinicians should be aware of rurality as a potential risk factor for psychosocial, QOL, and clinical impairments. Future research should examine causes of these rural health disparities and develop interventions to address these issues.

Abstract 1509
THE ASSOCIATION BETWEEN BODY MASS INDEX (BMI), QUALITY OF LIFE, AND CANCER SYMPTOMS IN WOMEN WITH BREAST CANCER

Emalee Kiser, M.A., Chelsea Ratcliff, Ph.D., Psychology, Sam Houston State University, Huntsville, TX, Alejandro Chaoul, Ph.D., Palliative, Rehabilitation, and Integrative Medicine, Division of Cancer Medicine, The University of Texas MD Anderson Cancer Center, Houston, TX, Martica Hall, Ph.D., Psychiatry, University of Pittsburgh, Pittsburgh, PA, Lorenzo Cohen, Ph.D., Palliative, Rehabilitation, and Integrative Medicine, Division of Cancer Medicine, The University of Texas MD Anderson Cancer Center, Houston, TX

BACKGROUND:BMI affects mortality and quality of life (QOL) in breast cancer patients. However, the findings are equivocal with some indicating higher BMI is associated with improved QOL, and others the opposite. The effect of BMI on cancer-related outcomes may depend on menopausal status, with higher BMI leading to higher mortality particularly in postmenopausal women. Poor sleep quality has also been associated with BMI and QOL in cancer populations. However, the moderating effects of menopausal status and sleep on the association between BMI, QOL, and cancer symptoms after chemotherapy (CT) for breast cancer has not been examined.

METHODS: The current study is a secondary analysis of an RCT that examined the effects of a Tibetan yoga program, compared to a stretching program and usual care group for 227 women undergoing CT for breast cancer. BMI and menopausal status were derived from medical records pre-CT. Physical and mental health-related QOL (SF-36 PCS and MCS), cancer symptoms (MDASI), and sleep variables (PSQI and actigraphy sleep efficiency) were assessed at the beginning of CT and 6 months later, at the end of CT. All analyses covaried for group assignment and randomization factors (stage, type of surgery, CT regimen, timing of CT, menopausal status, age, time since diagnosis).

RESULTS: Two-way ANOVAs examining the effect of BMI (categorized as underweight, normal weight, overweight, and obese) on each of the 3 dependent variables (post-CT PCS, MCS, and MDASI) revealed that being obese was associated with poorer post-CT PCS (Least Squared Mean (LSM)=46.83) compared to being normal (LSM=50.89, p=0.01) or underweight (LSM=52.22; p=0.03). BMI was not related to post-CT MCS or MDASI.

There was a trend for menopausal status to moderate the effect of BMI on post-CT PCS (p = 0.078). Specifically, for post-menopausal women, being obese was associated with poorer post-CT PCS compared to being normal (p=0.02) or underweight (p<0.01). For pre-menopausal women, BMI category was not associated with post-CT PCS. Baseline PSQI and actigraphy sleep efficiency did not moderate the effect of BMI on post-CT PCS, MCS, or MDASI.

CONCLUSIONS: Results suggest lower BMI is associated with higher physical health-related QOL after CT, and this effect may be particularly strong for individuals who are post-menopausal. The effect of BMI on QOL did not depend on sleep.

Abstract 1721
SPONTANEOUS INCREASE IN SELF-COMPASSION IS ASSOCIATED WITH FEWER SYMPTOMS AND IMPROVED WELL-BEING IN CANCER SURVIVORS

Mimi Mehlsen, PhD, Psychology and Behavioural Science, Aarhus University, Viby J, Denmark, Eva Nissen, MSc, Psychology and Behavioural Science, Aarhus University, Aarhus C, Denmark, Inger Højris, MD, Michael Borre, DMSc, Oncology, Aarhus University Hospital, Aarhus N, Denmark, Robert Zachariae, DMSc, Psychology and Behavioural Science, Aarhus University, Aarhus C, Denmark

Background: Cancer survivorship frequently entails a challenging transition period when the patient moves from the patient role back into ordinary life after cancer treatment. A substantial percentage of cancer survivors experience significant distress and some seek psychological treatment. However, some individuals spontaneously

recover from symptoms of distress. Possibly, they apply emotion-focused coping successfully. One potential strategy to handle distress symptoms could be a self-compassionate attitude. Self-compassion is proposed to be a healthy way of relating to oneself in times of suffering and it has consistently been linked to psychological well-being.
Aim: The study aimed to explore change in self-compassion over a 6 months period and to test whether change in self-compassion was predictive of later distress symptoms in a group of cancer survivors.
Methods: Participants were 46 cancer survivors who screened positive for distress and were enrolled in a RCT wait-list control group. Of these, 41 were women diagnosed with breast cancer and 5 were men diagnosed with prostate cancer; mean age 55 years. At baseline participants answered questionnaires measuring self-compassion, anxiety, depression, stress, well-being, self-rated health, late-effects, and diseases. Six months later, they answered the same questionnaires.
Results: At baseline self-compassion was inversely associated with depression (r=-.388) and stress (r=-.375) but not anxiety, well-being, self-rated health, late-effects or number of diseases. Over the 6-months period, the sample did not change significantly in self-compassion (t=-1.41, p=.167) but self-compassion development varied; change in scores ranged from -15 to 22. Increase in self-compassion was associated with lower depression, anxiety, stress (r: -.480 - -.426), better self-rated health and more well-being (r: .565-579 at follow-up. Except for anxiety (p=0.077), these associations remained significant when controlling the baseline symptoms.
Conclusions: Over a 6-month period, increases in self-compassion were associated with lower levels of distress and more well-being in a sample of distressed cancer survivors. This development was observed among survivors who did not receive any psychological interventions. This may indicate that some individuals spontaneously initiates strategies that lead to successful adaptation

Abstract 1428

ASSOCIATIONS BETWEEN DISEASE-SPECIFIC COPING STRATEGIES AND SLEEP OUTCOMES AMONG LUNG CANCER PATIENTS

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Background: Approach-oriented coping (efforts to engage with the stressor and its related emotions) is generally related to favorable adjustment to cancer, whereas avoidance is reliably associated with poorer health outcomes. Less is known about the associations of disease-specific coping strategies and sleep, an important outcome in its robust association with depression and mortality. This cross-sectional study tested avoidance- and approach-oriented coping as predictors of sleep quality, duration, and disturbance in lung cancer patients. Based on theory and research, we hypothesized that higher avoidance would be related to poor sleep and explored whether specific components of approach-oriented coping (acceptance, positive reinterpretation, processing and expressing emotions) were differentially associated with sleep outcomes. **Method:** Participants (N=101) were men (52%) and women receiving oncologic treatment for lung cancer (median number of months since diagnosis = 9.97). Participants completed validated measures of sleep behavior and cancer-related coping strategies. Multivariable linear regressions assessed coping strategies as predictors of sleep outcomes, controlling for age, gender, race/ethnicity, and smoking status. Coping variables were tested both as independent and simultaneous predictors of sleep outcomes. **Results:** Greater use of cancer-related avoidance was associated significantly with more sleep disturbance ($?R^2$=.10, b=5.11, p=.003), but not with sleep duration or quality (ps>.38). Higher acceptance was related significantly to lower sleep disturbance ($?R^2$=.05, b=-1.94, p=.041) and coping through processing and expressing emotions to better sleep quality ($?R^2$=.06, b=0.29, p=.026). Positive reinterpretation was not related significantly to any outcome (ps>.34). When entered simultaneously, coping strategies ($?R^2$=.14, p=.018), and specifically avoidance (b=4.75, p=.007), were associated significantly with sleep disturbance. **Conclusion:** Lower avoidance and higher acceptance were associated with lower sleep disturbance and coping through emotional approach was associated with better sleep quality. Pending longitudinal replication of the findings, psychosocial approaches that promote cancer-related acceptance and emotional expression and reduce avoidance may be beneficial in improving sleep outcomes for lung cancer patients.

Abstract 1753

EXAMINING MEDIATORS OF THE EFFECT OF COPING STRATEGIES ON QUALITY OF LIFE FOR WOMEN UNDERGOING CHEMOTHERAPY FOR BREAST CANCER

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Background: Use of adaptive coping strategies during treatment for cancer has been associated with higher quality of life (QOL), and the reverse may be true for maladaptive coping. Diagnosis and treatment for cancer may lead to posttraumatic growth (PTG) or posttraumatic stress (PTS). This study examines PTG and PTS as mediators of the association of coping strategies on QOL for women undergoing chemotherapy (CT) for breast cancer.
Methods: The current study is a secondary analysis of an RCT that examined the effects of a Tibetan yoga program compared to stretching and usual care in women with breast cancer undergoing CT. The current study examined the effect of coping strategies [Brief-COPE categorized as adaptive (use of emotional support, positive reframing, planning, active, religious coping) and maladaptive (denial, behavioral disengagement, venting)] assessed at the beginning of CT (baseline), on physical (SF-36 PCS) and mental (SF-36 MCS) health-related QOL assessed at baseline and 9-mo post-CT. Mediator variables included PTG and PTS (Impact of Event Scale (IES) avoidance and intrusion subscales) assessed 3-mo post-CT. All analyses covaried for group assignment, stage of disease, type of surgery, age, education, and the baseline level of the outcome variable.
Results: Adaptive coping was not significantly associated with post-CT PCS (B=.81, SE=.67, p=0.23), but was associated with greater 3-mo PTG (B=7.30, SE = 2.15, p<0.01), which was in turn associated with greater 9-mo PCS (B=0.06, SE=0.03, p=0.03). The bias-corrected bootstrap procedure using Hayes' PROCESS macro revealed that the effect of baseline adaptive coping on 9-mo PCS was partially mediated by 3-mo PTG (B=.46; SE=.26, CI=0.06 to 1.09). Maladaptive coping was not significantly associated with 3-mo PTG or PTS or 9-mo PCS or MCS. All subscales of 3-month IES were associated with poorer 9-mo MCS (p's<0.01), but were not found to be significant mediators of the effect of coping on post-CT QOL.
Conclusion: Use of adaptive coping strategies at the beginning of chemotherapy may increase posttraumatic growth after chemotherapy, which may in turn increase subsequent physical health-related QOL. Future research is needed to confirm and further develop the current findings on time-based scope of posttraumatic growth, across all survivorship in women with breast cancer.

Abstract 1163

THE USE OF THE CENTER FOR EPIDEMIOLOGICAL STUDIES-DEPRESSION SCALE FOR SCREENING ADVANCED CANCER PATIENTS

Jennifer L. Steel, PhD, Jessica Miceli, MS, David Geller, MD, Wallis Marsh, MD, Tyler Bradley, B.S., Alan Tsung, MD, Heather Jackson, B.S., Hannah Cheng, BS, Ritambhara Pathak, BS, Yisi Wang, MPH, Surgery, University of Pittsburgh, Pittsburgh, PA

Background: Screening for distress in cancer patients has been recommended by the Institute of Medicine, the American College of Surgeons, and the American Society of Clinical Oncology. The aim of this study was to examine the psychometric properties of the Center for Epidemiological Studies-Depression scale as a screening instrument for advanced cancer patients in the oncology or palliative care setting. **Methods:** Patients diagnosed with advanced cancers were screened for depressive symptoms using the Center for Epidemiological Studies-Depression (CES-D) scale in an outpatient oncology clinic and again approximately 4 weeks later. A structured clinical interview was performed approximately a week later to determine the best cut point and the sensitivity and specificity of the CES-D in the context of advanced cancer. The structured clinical interview revealed whether the patient met the DSM-V diagnostic criteria for Major Depressive Disorder, Dysthymia, or Mood Disorder due to Medical Condition. **Results:** Of 96 patients, the mean age was 65.3 (SD=9. 8), 53.1 % were male, 90.6% were Caucasian, and 23% were employed part- or full-time. Of all of the patients, 33% had a diagnosis of pancreatic, stomach, or appendicle cancer; 50% a diagnosis of hepatocellular or cholangiocarcinoma; and 17% a diagnosis of other primary cancers with metastases to the liver. The internal consistency for the CES-D was high (Cronbach alpha=0.91) and test-retest reliability of the CES-D from screening to re-administration 3-4 weeks later was 0.62. Using a structured clinical interview that was performed approximately a week after the second administration of the CES-D (mean 11 days, median 6 days), the Area Under the Receiver Operating Characteristic (AUROC) curve was 0.8924 (95% CI=0. 8225-0. 9623, p<0. 001). These findings suggest that the use of the CES-D to accurately identify advanced cancer patients who would be diagnosed with a mood disorder was good. Therefore, the optimal cutoff point for CES-D for use in advanced cancer patients was 19 which yielded a sensitivity score of 0.81 and specificity of 0.813. **Conclusion**: Preliminary findings suggest that a cut-off score of 19 for the CES-D accurately identifies patients with advanced cancer who meet DSM-V criteria for a mood disorder.

Caregiving

Thursday, March 7 from 1:15 to 2:15 pm

Abstract 1707

CHRONIC STRESS AND DEPRESSIVE SYMPTOMS MODERATE THE IMPACT OF CAPITALIZATION OF POSITIVE AFFECT ON INFLAMMATION.

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Background: Capitalization of positive affect is an interpersonal process wherein an individual share positive experiences with others. Capitalization has been associated with increased positive affect and enhanced relationship quality. Prior research indicates that the association between capitalization and positive affect is stronger in the context of chronic stress and among individuals with elevated depressive symptoms. The goal of this study was to assess whether greater capitalization was associated with lower systemic inflammation and whether chronic stress and depressive symptoms moderated this effect. **Methods:** This sample (n =223) was comprised of 123 mothers caring for an adolescent with a neurodevelopmental disorder and 100 mothers of typically developing adolescents. Participants completed a daily diary assessment of capitalization for 6 consecutive days, the Center for Epidemiological Studies-Depression scale, and provided a blood sample for inflammatory markers analysis. **Results**: Bivariate correlations indicated that capitalization was significantly associated with C-reactive protein among caregivers, r = -.19. p = .03, but not among controls, r = -.009. p = .92. Capitalization was not significantly related to interleukin-6 among caregivers, r = -.11, p = .20, or controls, r = -.003, p = .97. In a linear regression model adjusting for age and body mass index, the three-way interaction among capitalization, caregiving stress, and depressive symptoms was a significant predictor of C-reactive protein, p = .04, R^2 = .014, and a marginal predictor of interleukin-6, p = .05, R^2 = .012. Simple slopes analyses revealed that capitalization was associated with lower inflammation among caregivers exhibiting high levels of depressives symptoms, but not among less depressed caregivers and noncaregiving controls. **Conclusion:** These results suggests that capitalization interactions maybe related to lower inflammation among depressed caregivers.

Abstract 1170

EARLIER OXYTOCIN AND INTERLEUKIN-6 PREDICT CHANGES IN CAREGIVING STRESS DURING THE FIRST YEAR AFTER THE CANCER DIAGNOSIS OF RELATIVES

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Background: Cancer is one of the most common chronic illnesses requiring care from family. Family members, however, are not well prepared for their new caregiver role, mainly because the diagnosis is often unexpected yet imposes substantial challenges. Less known are the roles of pre-existing demographic and biological characteristics of the caregivers in their perceived stress from caregiving. This study aimed to examine the extent to which family caregivers' demographic and biological characteristics around the time of diagnosis predict changes in perceived caregiving stress during the first year since the diagnosis.

Method: Family caregivers of newly diagnosed colorectal cancer patients (51 years old, 44% female, 34% Hispanic, 24% spouse of the patient) completed a questionnaire and provided blood samples around 3 (T1) and 12 months post-diagnosis (T2). Biological characteristics include oxytocin (OT) and interleukin-6 (IL-6), assayed from the blood sample at T1. Demographic characteristics were self-reported gender and familial relationship to the patient. Various aspects of caregiving stress were measured using the CRA (lack of family support, impact on schedule, impact on finance, caregiver self-esteem) at T1 and T2. Age and T1 CRA scores served as covariates.

Results: Caregivers reported moderate levels of caregiving stress at both times. Hierarchical general linear modeling revealed that the corresponding aspect of caregiving stress at T1 significantly predicted that at T2 (p< .001). Controlling for covariates, higher OT at T1 predicted greater impact on finance at T2 (p=.04) and marginally predicted greater family support at T2 (p=.08). Greater IL-6 at T1 also predicted greater impact on finance at T2 (p=.05). Male caregivers reported greater lack of family support at T2 (p=.01). **Conclusion**: Perceived caregiving stress has been a significant predictor of morbidity development years later. Both anti-inflammatory (OT) and pro-inflammatory (IL-6) biomarkers reflected the subsequent tangible burden of cancer treatment, whereas male gender suggested following the psychological burden of being primary caregiver without adequate family support. Further investigations on these differential roles of biological and demographic characteristics in changes of perceived caregiving stress across illness trajectories and in longer-term health outcomes are warranted.

Abstract 1472

PATHWAYS TO PSYCHOPHYSIOLOGICAL RESILIENCE IN YOUNG INFORMAL CAREGIVERS: MAPPING THE IMPACTS OF CHRONIC STRESS

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Background & rationale: Research with adult and elderly informal caregivers has advanced via discovery of biological factors such as cortisol, which are at play in the context of chronic stress. Research with young caregivers (those under 18 years providing care) has found adverse mental, physical and social outcomes, such as anxiety, depression, social exclusion and poor educational attainment. Unlike adult and elderly caregiver research, young caregiver studies are not as advanced, typically focussing on outcomes and to date, have not explored biopsychosocial resilience factors in young caregivers and stress outcomes; resilience pathways have not been identified nor have stress biomarkers been examined.

This study builds on a systematic review and empirical work which identified potential protective factors in young caregivers on individual, family and community levels including problem/emotion-focussed coping strategies, cognitive strategies and social support.

Aim: The aim of this study is to explore whether factors such as coping, benefit finding, social support, time spent outdoors and perceived stress are related to psychophysiological resilience in young caregivers.

Method: Participants were 46 young caregivers and 46 non-caregivers (age and gender matched), aged 11 to 18 years with 29 females in each group. Posterior cortex hair samples enabled biological assessment of cortisol to explore physiological outcomes of youth caregiving. Questionnaires measured coping, benefit finding, family support, non-family support, pet ownership, time spent outdoors, perceived stress and resilience.

It is hypothesised that: 1) young caregivers will report greater perceived stress than controls; 2) there will be a positive association between perceived stress and hair cortisol levels; 3) there will be a negative association between resilience and hair cortisol levels; and 4) resilience will mediate the association between perceived stress and hair cortisol.

Impact: Findings may identify psychophysiological resilience pathways in young caregivers, assisting the development of interventions by harnessing factors which demonstrate a protective element against the stress experienced by this population.

Note: Data collected. Analysis underway and due for completion Dec 2018.

Abstract 1579

COMBINING TELOMERE LENGTH AND TELOMERASE ACTIVITY TO EXAMINE THE IMPACT OF THE CHRONICITY OF CAREGIVING

Timothy S. Sannes, PhD, Blood Cancer and BMT Program, University of Colorado Anschutz, DENVER, CO, Crystal L. Natvig, MS, Department of Psychiatry, University of Colorado Anschutz, Aurora, CO, Jue Lin, PhD, Department of Biochemistry and Biophysics, Elissa S. Epel, PhD, San Francisco, University of California San Fransisco, San Francisco CA, CA, Mark L. Laudenslager, PhD, Department of Psychiatry, University of Colorado Anschutz, Aurora, CO

Background: Caregivers (CGs) often experience significant distress and this can have downstream effects, such as impacting cellular markers of aging like telomere length. However, the dynamics of how telomere length and the repair enzyme, telomerase, interact with distress and prior caregiving are less clear. We have previously reported relationships between telomere length and anxiety/depression and here we extend this work to chronicity of caregiving based on Zalli's [2014] approach to quantifying telomere/telomerase dynamics.

Methods: We analyzed cross-sectional data prior to the initiation of a stress management intervention for CGs of stem cell transplant patients. Chronicity of caregiving, previously shown to be related to telomeres, was operationalized as patients' duration of illness and a sum based on other caregiving responsibilities. Telomere length (TL) was split at the median, and the shorter telomere group (group of interest) was further median split into low and high telomerase activity (TA). This resulted in three groups: Short TL with *low* TA (LoTL/LoTA), Short TL with *high* TA (LoTL/HiTA) and long TL (HiTL). Relationships between chronicity of caregiving were examined in two separate multinomial logistic regressions to predict membership into one of the three groups. We hypothesized that more prior caregiving would result in a greater likelihood of participants belonging to the LoTL/HiTA group.

Results: The 143 CGs providing full data were predominantly middle-aged (*Mage*=54.4; *SD*=13.3), Caucasian (86.7%) females (78.3%). After controlling for caregiver sex and age, results indicate that more prior caregiving (OR=2.11;p<.05) and longer durations of patients' illness (OR=.98;p<.05) were both significantly associated with membership in the LoTL/HiTA group, consistent with original hypotheses.

Discussion: These preliminary data suggest that additional caregiving responsibilities (both longer duration of patient illness and more prior caregiving responsibilities) are related to caregivers' likelihood of belonging to the LoTL/HiTA group – a pattern suggesting additional cellular repair with increased chronicity of caregiving. These relationships may hold implications for caregiving research at large. Future research will examine whether these TL/TA groupings are related to CG outcomes over time as well as affected by intervention.

PCORI:CE1308-6208

Changing Health Behaviors

Saturday, March 9 from 3:30 to 4:30 pm

Abstract 1014

RANDOMIZED CLINICAL TRIAL OF BRIEF BEHAVIORAL TREATMENT FOR INSOMNIA IN HEART FAILURE

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Background: Comorbid insomnia is prevalent among heart failure (HF) patients and associated with poorer mental and physical functioning, including possible exacerbation of cognitive deficits. Initial investigations document the effectiveness of cognitive-behavioral therapy for the treatment of insomnia in HF. However, due to the high symptom burden of HF, there exists a need for alternative interventions that place fewer time and physical endurance demands on patients. This study evaluated the effects of Brief Behavioral Treatment for Insomnia (BBTI) on insomnia and its relevant correlates among HF patients.

Methods: Twenty-three HF patients with at least mild chronic comorbid insomnia (70% women; 65% white; M_{age} = 55.7 ± 11.3 years; NYHA Class III = 61%) were randomized to a sleep monitoring (SM) control group (n = 11) or behavioral intervention (BI) group (n = 12). BI participants completed the manualized BBTI intervention across four weekly sessions while SM participants received no contact during this time. Participants completed pre- and post-intervention assessments of sleep, cognitive functioning, quality of life, distress, self-care, and functional status. The primary mode of data analysis was repeated measures multivariate analysis of variance.

Results: BI participants experienced significant reductions in insomnia (t(11) = -3.71, p = .003), as well as improved sleep quality (t(11) = -3.53, p = .005) and sleep efficiency (t(9) = 3.45, p = .007), but SM participants did not change. Clinically meaningful reductions in insomnia were experienced by 58% of BI group participants, with

27.3% achieving complete remission. BI participants also experienced improvements in depression ($t(11) = -4.50$, $p < .001$), anxiety ($t(11) = -4.45$, $p = .001$), and HF-related quality of life ($t(11) = 3.29$, $p = .007$). No changes were observed in cognitive function, self-care, or functional status.

Conclusions: These pilot data represent the first successful application of BBTI to a disease-specific population and support the efficacy of BBTI for the treatment of insomnia in HF patients. The brief intervention demonstrated a high degree of acceptability within this symptom-limited patient population and was effective in improving insomnia, distress, and quality of life.

Abstract 1692

CHANGING EATING BEHAVIOR IN CANTEENS FOR GOOD: PRELIMINARY RESULTS FROM A MULTIMODAL COMPLEX INTERVENTION

Joachim E. Fischer, MD, Mannheim Institute of Public Health, Heidelberg University, Mannheim, Germany, Klaus-Peter Knoll, MD, PhD, Health Management, BMW Group, Munich, Germany, Oliver Jahns, BA, Key Accounts, Peter Nauroth, PhD, Data Management, HealthVision GmH, Heidelberg, Germany

Background - Problem: The holy grail of diabetes type 2 prevention is the sustained change in nutritional behavior. The intended behavior change is to consume less carbohydrates or foods with lower glycemic load. Targeting individuals through personalized nutritional consultation has largely failed to produce sustained results. Here we report on a multimodal intervention in canteens aiming to sustainably alter food selection and meal purchasing behavior amongst employees of a large automotive industry group. Further, we tested whether changes in canteen purchases explain variation in longitudinal (2.4 years) follow-up HbA1c measurements.

Methods: Target population: All canteens as German sites of a large industrial group (ca. 100.000 possible consumers). Complex multimodal intervention: from 2010-2012 canteen chefs were trained in the concept of producing attractive low-glycemic load meals, as operationalized by the calculated glycemic load based on nutritional composition. From 2012-2013 advertising campaigns attempted to improve popularity of "healthy meals". In 2014 food labeling (green, yellow, red) was introduces. In 2016 a key performance indicator was introduced as the consummation ratio, calculated as score with range from -1 to +1 derived from the number of sold "green" (+1), "yellow" (0) and red meals (-1). Canteen chefs received a personal and a company target (i.e. 0.35 for the company to be reached in 5 years) and the monthly "league table" was published. We measured HbA1c levels in employees participating in a comprehensive health-check in 2014 and who returned for the health-check in 2017 (n = 1,354). We regressed HbA1c change scores onto cantine-specific consummation ratios.

Results: From a consummation ratio of 0.03 in Jan. 2014, monthly ratios increased to values between 0.1 and 0.2 after introducing the food labelling. During the four months following starting of incentivizing of canteen chefs (Jan. 2016), consummation ratios rose to above 0.3 and stayed between 0.3 and 0.4 until the end of this follow-up (6-2017). HbA1c levels decreased (- 0.08%, $p < 0.001$), with the largest effects amongst those in the pre-diabetes range (HbA1c 5.7-6.5%).

Discussion: This complex multimodal canteen intervention achieved sustained change in consummation, potentially leading to physiologically relevant change in nutrition behavior. Follow-up is ongoing.

Abstract 1343

TEXT MESSAGING INTERVENTIONS TO INCREASE PHYSICAL ACTIVITY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Christopher M. Celano, M.D., Psychiatry, Harvard Medical School, Boston, MA, Diana Smith, BA, Laura Duque-Serrano, MD, Psychiatry, Brian Healy, PhD, Neurology, Massachusetts General Hospital, Boston, MA, Jeff Huffman, MD, Psychiatry, Harvard Medical School, Boston, MA

Background: Physical activity is associated with improved mental and physical health, but many individuals fail to achieve recommended levels of activity. Existing physical activity interventions are time- and resource-intensive and may not be implementable in real-world clinical settings. Text messaging interventions (TMIs) that deliver activity-related messages in real-time to promote activity in an ongoing manner have the potential to impact long-term activity levels. However, the literature examining the impact of these interventions to promote physical activity is heterogeneous and has not been studied in a systematic way.

Methods: We performed a systematic review and meta-analysis of TMIs to promote physical activity. Searches of PubMed, PsycINFO, Scopus, and Cochrane databases from inception to January 2018 were used to identify articles, and these were supplemented with a search of ClinicalTrials.gov. Studies were eligible for inclusion in the review if they included a one-way, text messaging intervention to promote physical activity in adult samples. A subset of randomized, controlled trials that included an objective (accelerometer-based) physical activity outcome were included in random effects meta-analyses examining the impact of TMIs on physical activity (steps/day) and minutes of moderate to vigorous physical activity (MVPA) per day.

Results: The systematic search revealed 944 articles. Of these, 762 were excluded based on title and abstract screening, and an additional 109 articles were excluded after reviewing the full text. The remaining 73 articles were included in the review. Twelve articles provided sufficient data to be included in meta-analyses. Meta-analyses revealed that TMIs led to significantly greater post-intervention physical activity (in steps/day; Cohen's $d = 0.38$ [95% CI 0.16, 0.61]) and marginally greater post-intervention MVPA ($d = 0.31$ [95% CI -0.01, 0.63]) compared to control groups.

Conclusions: TMIs significantly increase physical activity--but not MVPA--in a variety of patient populations. Further efforts should be made to optimize these types of interventions and adapt them for use in different clinical populations.

Abstract 1704

IDENTIFYING COMMON VERSUS SPECIFIC GENETIC INFLUENCES ON SUBSTANCE USE: A GENETICALLY INFORMED APPROACH

Eleonora Iob, MSc, Behavioural Science and Health, Tabea Schoeler, PhD, Jean-Baptiste Pingault, PhD, Department of Clinical, Educational and Health Psychology, University College London, London, United Kingdom

Background. There are a number of mental health, personality, cognitive, and physical traits which have been shown to increase the individual's liability to the use of multiple psychoactive substances. The aforementioned traits may explain the observed patterns of comorbid substance use, where a common genetic susceptibility could underlie this co-occurrence. Polygenic scores (PGSs) have recently emerged as a new method to unravel the genetic aetiology of substance use.

Aim. To investigate common versus drug-specific genetic influences on substance use over time using a wide range of PGSs of individual traits which are commonly associated with substance use.

Methods.The sample included 4,218 young adults from the Avon Longitudinal Study of Parents and Children. Phenotypic data on substance use (i.e. tobacco, alcohol, cannabis, and other illicit drugs) was collected at 17, 20, and 22 years. Trait-state-occasion (TSO)

modelling was used to identify a common substance use factor shared across the four drug indicators and stable over time, as well as drug-specific factors. The PGSs were calculated using summary statistics from published genome-wide-association studies.

Results. The TSO model fitted the data well, *CFI*=0.987, *RMSEA*=0.018, *SRMR*=0.027. Higher PGSs of depression (b=0.05, p=.010) and risk-taking (b=0.11, p<.001) were significantly associated with greater common liability to substance use, whereas the PGS of extraversion was negatively associated with the common liability factor (b=-0.09, p<.001). The nicotine factor was significantly associated with higher PGSs of depression (b= 0.05, p=.005) and body mass index (BMI) (b=0.06, p=0.003), and with lower PGS of educational attainment (b=-0.13, p<.001). For alcohol, greater PGS of educational attainment (b=0.04, p=0.027) and lower PGSs of BMI (b= -0.05, p=0.016) and Extraversion (b=-0.11, p<.001) were significantly associated with greater alcohol use.

Conclusions. Higher genetic predisposition to depression and risk-taking may increase substance use risk for any type of substance, whilst extraversion may decrease such vulnerability. Furthermore, greater genetic predisposition to high educational achievement could decrease liability to nicotine, but increase alcohol use. In contrast, greater genetic risk for high BMI may lead to greater nicotine use but lower alcohol consumption.

Child & Adolescent Health

Saturday, March 9 from 1:45 to 3:15 pm

Abstract 1407

EARLY CHILDHOOD MENTAL HEALTH AND CARDIOMETABOLIC DYSREGULATION AT AGE 9: A PROSPECTIVE COHORT STUDY

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Background: Research suggests poor mental health is associated with higher cardiovascular risk among adults, but less is known about when in life course these associations begin to emerge. This study tests whether childhood emotional and behavior problems predict increases in cardiometabolic dysregulation as early as age 9.

Methods: Data are from 4,327 participants in the ongoing Generation R Study. Child emotional and behavioral problems were rated by mothers via the Child Behavior Checklist when participants were aged 5. Cardiometabolic dysregulation was defined at ages 5 and 9 using measures of high-density lipoprotein cholesterol (HDL-C), non-HDL-C, systolic and diastolic blood pressure, C-reactive protein, and body mass index. Dysregulated levels of each parameter were defined by the unhealthiest quintile of the sample distribution. Children's total number of dysregulated parameters were summed to produce scores ranging from 0-6 at each age. Binary health measures (dysregulation score 0-1 vs. ≥2) were also created to identify trajectories over time (i.e., persistently healthy/unhealthy, dysregulation increased/decreased).

Poisson regression models tested associations between standardized age 5 problem scores and age 9 cardiometabolic dysregulation, controlling for confounders and baseline levels of dysregulation. Since most children remained healthy over the study period, we also used multinomial logistic regression to assess associations with poor health trajectories.

Results: Higher levels of emotional and behavior problems at age 5 were prospectively associated with higher cardiometabolic dysregulation at age 9 in unadjusted (IRR=1.06 [1.03, 1.10]; p<0.001) and fully adjusted models (IRR=1.03 [1.00, 1.06]; p=0.04). Each standard deviation increase in problem scores was associated with a 10% greater likelihood of becoming dysregulated over time (RRR=1.10 [1.00, 1.21]; p=0.06). No significant associations were observed with other health trajectories (e.g., persistently dysregulated, dysregulation decreased).

Conclusions: These findings provide evidence of a longitudinal link between children's mental health and early declines in cardiometabolic health. To our knowledge, this is the first study to demonstrate that the physiologic effects of psychological distress identified in adult populations may be observed during childhood.

Abstract 1255

DISPOSITIONAL COPING PREDICTS STRESS REACTIVITY IN OVERWEIGHT/OBESE ADOLESCENTS

Tiwaloluwa A. Ajibewa, MS, Childhood Disparities Research Laboratory; School of Kinesiology, Tessa Adams, BS, Amaanat K. Gill, BS, Lauren Mazin, MS, Julia Gerras, BS, Childhood Disparities Research Laboratory, Rebecca Hasson, PhD, Childhood Disparities Research Laboratory; School of Kinesiology, University of Michigan, Ann Arbor, MI

Introduction: Adolescence is a period of amplified stress, where the ability to cope with daily hassles can foster resilience or lead to increased biological vulnerability to stress. **Purpose:** To examine the relationship between coping strategies and stress reactivity [salivary cortisol and alpha amylase (sAA) response] to an acute laboratory stressor in overweight/obese adolescents. **Methods:** Fifty-one overweight/obese adolescents (27 males, 24 females; ages 14-19 years) were included in this analysis. Coping strategies (frequency, effectiveness and type) were assessed using the Schoolager's Coping Strategies questionnaire. Reactivity was calculated as salivary cortisol and sAA area under the curve (AUC) during the laboratory stressor. **Results:**When examining the combined effect of all 26 coping strategies on stress reactivity, it was observed that sAA AUC was inversely associated with coping strategy effectiveness (β= -245.2±98.7 U/ml/min, p=0.02), with higher coping strategy effectiveness associated with lowered sAA response. sAA AUC was marginally associated with coping strategy frequency (β= -242.0±124.8 U/ml/min, p=0.06). Cortisol AUC was not associated with coping strategy effectiveness nor frequency (p's>0.05). When coping strategies were examined individually, 6 coping strategies were related to cortisol or sAA reactivity. Higher frequency of active coping strategies "doing something about it" and "praying" were associated with lowered cortisol AUC (p<0.05). For sAA, higher frequency of "doing something around the house" and greater self-reported effectiveness for the active coping strategy "saying sorry or telling the truth" were related with lowered sAA AUC (p<0.05). Higher frequency of distraction coping "biting nails/cracking knuckles" was associated with lower sAA AUC (p<0.05), but higher frequency of the active expression of feelings such "cry or feel sad" was related with greater sAA AUC (p<0.05). **Conclusions:** Greater frequency and effectiveness of coping strategies predicted lower sAA reactivity, but not cortisol reactivity in overweight/obese adolescents. Individually, active coping strategies tended to relate with lowered cortisol and sAA reactivity. Stress reduction interventions in youth should aim to increase the use of active coping strategies to improve how youth cope with stress as a means of promoting greater stress resilience.

Abstract 1300

OVERWEIGHT AND OBESE ADOLESCENTS DECREASE CALORIE CONSUMPTION IN RESPONSE TO AN ACUTE LABORATORY STRESSOR

Rebecca E. Hasson, PhD, Kinesiology, Matthew R. Nagy, MPH, Public Health, Amaanat K. Gill, BS, Kinesiology, Tessa E. Adams, BS, Biopsychology, Cognition, and Neuroscience, Julia E. Gerras, BS, Lauren E. Mazin, MS, Kinesiology, University of Michigan, Ann Arbor, MI, Cindy Leung, ScD, Public Health, University of Michigan, 3866 SPH I, MI

Background: Overweight and obese adolescents exhibit greater cortisol reactivity in response to acute stress, are more likely to eat in

response to emotional cues, and have greater sensitivity to food cues following stress, all of which suggest an increased susceptibility to stress-induced eating. The purpose of this study was to examine the biological (cortisol and alpha-amylase reactivity) and behavioral (caloric intake) responses to an acute laboratory stressor in overweight and obese adolescents. **Methods:** Fifty-one adolescents ages 14-19 years (47% female, 55% white, mean BMI: 31.2±0.8 kg/m^2) were exposed to the Trier Social Stress Test (TSST) and a control condition on separate days in random order. Immediately following the TSST and control conditions, participants were provided with snacks (low-fat salty, high-fat salty, low-fat sweet, and low-fat/sweet-salty) to eat at their leisure over a span of two hours. Reactivity was assessed via salivary cortisol and alpha-amylase during both conditions, and adolescents were grouped into high and low reactors for both measures. **Results:** Overall, adolescents consumed significantly fewer calories during the stress condition (488±51 kcal) compared to the control condition (639±41 kcal, p=0.005). High cortisol reactors decreased their calorie consumption significantly more than low reactors from control to stress (-259±69 kcal vs. -43±76 kcal, p=0.04). **Conclusion:** Contrary to our hypothesis, high cortisol reactivity in overweight and obese adolescents resulted in lower calorie consumption following an acute laboratory stressor. Further research is needed to better understand the mechanisms underlying stress-induced suppression of food intake in overweight and obese adolescents.

Abstract 1774

DIM LIGHT MELATONIN ONSET MARKERS TO QUANTIFY CIRCADIAN PHASE IN CHILDREN AND ADOLESCENTS

Joanne Ramil, BSc, Amyna Kanji, BA BSc, Jennifer J. McGrath, PhD MPH, Pediatric Public Health Psychology Lab, Concordia University, Montreal, QC, Canada

BACKGROUND: Circadian rhythms are the underlying physiological processes driven by clock genes. Accurate assessment of these endogenous rhythms is essential, as they provide a context for behaviours, including sleep. Melatonin is considered to be a reliable biomarker for the circadian timing system due to its distinct diurnal pattern, with a nighttime surge prior to sleep onset. Dim light melatonin onset (DLMO) protocols are the gold standard to identify circadian phase. DLMO is commonly quantified as the time the melatonin concentration exceeds a threshold (3 or 4 pg/mL) in response to limited light exposure. Alternative measures have been proposed. Most measures have only been validated in adult populations. The study aim was to compare different measures of DLMO quantification to identify an optimal marker for circadian phase in children.

METHOD: Children (N=123; M_{age}=13.22 yrs; 43.9% female) who participated in the larger Healthy Heart Project in Montreal completed a DLMO protocol at home. During the DLMO protocol, children remained in their darkened bedroom (light meter <30 lux) and collected saliva samples every 30 min, starting 2 hours prior to habitual bedtime, until 1 hour afterward. Saliva was enzyme immunoassayed for melatonin. Unique measures to quantify DLMO included linear interpolation of thresholds, bedtime and maximum concentration, linear regression, area under the curve, and hockey-stick method.

RESULTS: Partial correlations, controlling for age, sex, puberty, and school year, indicated inter-correlations were strong among DLMO timing (r_{avg}=.817) and concentration measures (r_{avg}=.923), and moderate among rate of melatonin surge measures (r_{avg}=.479). DLMO timing was correlated with bedtime (sleep log; r_{avg}=.630), waketime (r_{avg}=.540), and chronotype (evening preference; r_{avg}=.260). DLMO concentration was inversely correlated with sleep onset delay (latency; r_{avg}=-.218). Rate of melatonin surge was correlated with sleep hygiene behaviors (daytime sleeping, bedtime routine; r_{avg}=.238).

CONCLUSION: Results suggest DLMO measures capture the timing, concentration, and rate of melatonin surge. While timing is used to identify circadian phase, these measures appear to uniquely capture distinct circadian dimensions and sleep behaviors. Future research should examine the relation of DLMO measures with timing of 24-hour physiological signals.

Abstract 1395

INSOMNIA SEVERITY INDEX ADAPTED FOR CHILDREN : PRELIMINARY VALIDATION IN CHILDREN AGED 8 TO 12 CONSULTING IN CHILD PSYCHIATRY

Karolane Renauld, PhD student, Guillaume F. Busques, PhD, Geneviève Belleville, PhD, Psychology, Université Laval, Québec, QC, Canada, Stéphane Turcotte, M.Sc., Centre de recherche du CISSS de Chaudière-Appalaches, Centre intégré de santé et de services sociaux de Chaudière-Appalaches, Québec, QC, Canada, Isabelle Denis, PhD, Psychology, Université Laval, Québec, QC, Canada

Backround: Up to 30% of children suffer from insomnia. This disorder has significant negative consequences for them and their families. The present study aims to validate in a preliminary manner an adaptation of the Insomnia Severity Index (Morin, 1993) to assess insomnia in children.

Method: 59 children aged 8 to 12 and their parents were recruited from youth mental health care settings. All children suffered from at least one anxiety disorder. Parents completed the Insomnia Severity Index adapted for children. This questionnaire includes two scales used to assess insomnia symptoms in children and their impact on the child (ISI-Child) and parent (ISI-Parent). Parents completed the My Child's Sleep Habit Questionnaire and the Child Behavior Checklist (CBCL).

Results: Both ISI-Child and ISI-Parent scales have adequate factorial structure (RMSEA ≤ 0.05) and their internal consistency is excellent ($\alpha = 0.87$ and 0.88 respectively). Convergent validity, assessed using the Waking During the Night scale in the My Child's Sleep Habit Questionnaire, is satisfactory for the ISI-Child ($r = 0.52$, $p < 0.001$) and the ISI-Parent ($r = 0.53$, $p < 0.001$). Divergent validity of both scales with the Rule-Breaking Behavior (r 0.26, p 0.05) and Aggressive Behavior (r 0.19, p 0.16) scales of the CBCL was also satisfactory.

Conclusion: The Insomnia Severity Index adapted for children appears to be a potentially reliable and valid measure for assessing insomnia in children. Further studies are needed to confirm its psychometric properties in diverse child populations.

Abstract 1551

ADOLESCENT AND PARENT "SHIFT-AND-PERSIST" SCORES ARE ASSOCIATED WITH ADOLESCENT ANTIBODY RESPONSE TO INFLUENZA VACCINATION

Sarah M. Lyle, M.S., Kelsey L. Corallo, B.S., Katherine B. Ehrlich, PhD, Psychology, University of Georgia, Athens, GA

Background: "Shift-and-persist" coping strategies involve cognitively reframing and persevering through life stressors. There is compelling evidence to suggest that a shift-and-persist coping style reduces the risk for negative physical health outcomes (Chen & Miller, 2012). For example, shift-and-persist is associated with inflammation regulation (a measure of innate immunity) in low-SES adolescents (Chen et al., 2015). This study extends previous research by examining the association between shift-and-persist coping strategies and *adaptive* immunity, measured via antibody production following influenza vaccination.

Methods: Participants ($n = 72$, $M_{age} = 14.5$yrs, 44.4% male) and their parents participated in a pilot study during the 2017-2018 influenza season. Participants completed two study visits. At the first visit, parents and adolescents completed the shift-and-persist scale (Chen et al., 2011, 2012) and adolescents provided blood samples via antecubital venipuncture and received the flu vaccine (quadrivalent FluZone split inactivated vaccine, Sanofi Pasteur). At the second

visit, 21 days later, adolescents provided a second blood sample to measure antibody production. Sera profiles (including hemagglutination inhibition (HAI) antibody titers) were examined pre- and post-immunization; this allowed us to assess the vaccine's boosting effect of vaccine-elicited antibody titers. The HAI assay protocol was adapted from the Centers for Disease Control and Prevention laboratory-based influenza surveillance manual.
Results: Using multiple regression, we tested whether adolescent and parent shift-and-persist scores predicted antibody production 21-days post-vaccination to each of the four strains in the vaccine (Tables 1 & 2). Age, sex, BMI, minority status, and day-0 antibody levels were included as covariates. Adolescent shift-and-persist approached significance (p = .09) in predicting responses to the H3N2 strain, but not the H1N1 or B-strains. Additionally, parent shift-and-persist approached significance (p = .07) with adolescent responses to the B/Phuket strain but not the B/Brisbane or A-strains.
Conclusions: These findings offer preliminary support for the notion that shift-and-persist strategies may be associated with adolescents' adaptive immunity. Data collection for the 2018-2019 season is ongoing and will expand on these findings.

VIEW PDF

Cortisol
Thursday, March 7 from 9:30 to 10:45 am

Abstract 1725
CORTISOL VARIABILITY AND INFLAMMATION ACROSS THE ADULT LIFE SPAN
Rachel E. Koffer, Ph.D., Psychiatry, University of Pittsburgh, Pittsburgh, PA, Nilam Ram, Ph.D., David M. Almeida, Ph.D., Human Development and Family Studies, Penn State, University Park, PA
Background: Links between cortisol trajectories and inflammation have primarily examined individuals' typical cortisol levels and slopes. However, individuals differ in the extent that they deviate from their typical diurnal pattern (i.e., cortisol variability). Recent evidence suggests greater cortisol variability may indicate Hypothalamic-Pituitary-Adrenal (HPA) dysfunction, which may subsequently be related to higher systemic inflammation. Older age may also exacerbate dysregulation across the two systems.
Methods: Data from the present analysis came from the National Study of Daily Experiences and the biomarker subprojects of the Midlife in the United States Study (MIDUS). To describe each individual's typical diurnal trajectory, person-specific four-part linear spline models were fit to repeated measures of salivary cortisol (4 samples of salivary cortisol on 4 consecutive days, total of 26,191samples) obtained from N = 1705 participants (Age Range: 33-84 years) across 6,714 days. Summary measures of variability describe the extent that each individuals' repeated measures of cortisol fluctuated (i.e., cortisol variability) around his/her typical diurnal trajectory. A structural equation model was then used to test associations among diurnal cortisol trajectory slopes, cortisol variability, age, and two latent factors of inflammation (systemic and endothelial; assessed by five inflammatory markers: IL-6, CRP, Fibrinogen, E-selectin, and sICAM).
Results: Contrary to expectations, the combination of steeper slopes and low variability in diurnal trajectory related to higher endothelial inflammation across the adult lifespan. Older age was linked with steeper slopes, but was not related to cortisol variability.
Conclusions: Implications of cortisol variability as an indicator of HPA dysregulation is discussed, particularly as the present findings did not replicate those of the new cortisol variability literature. Biopsychosocial correlates of cortisol slopes (e.g., stress), particularly as they interact with age, may be key in clarifying the role of cortisol variability with inflammation.

Abstract 1063
DAY-TO-DAY VARIABILITY IN CORTISOL PATTERNS AND FATIGUE IN YOUNG AND OLDER BREAST CANCER SURVIVORS
Heather Herriot, MA, Carsten Wrosch, PhD, Psychology, Concordia University, Montréal, QC, Canada, Catherine Sabiston, PhD, Kinesiology and Physical Education, University of Toronto, Toronto, ON, Canada
Background: While much research has focused on inter-individual differences in cortisol patterns (e.g., averaging cortisol over multiple days), there is an emerging body of literature that has demonstrated the importance of intra-individual differences (e.g., variability in cortisol across days) in cortisol patterns. Previous research has demonstrated associations between variability in cortisol levels across days and low-grade inflammation in aging populations. In cancer patients, the HPA axis can be disrupted following cancer diagnosis and treatment, therefore it is plausible to assume that cancer survivors may be particularly at-risk for dysregulated cortisol patterns. Fatigue is one of the most common and problematic issues to arise following cancer diagnosis and treatment. Notably, fatigue and other problems following cancer diagnosis tend to be more severe for younger survivors. As a result, this study examined associations between day-to-day variability in cortisol patterns and fatigue in breast cancer survivors. We hypothesized that greater fluctuations in breast cancer survivors' cortisol output could predict increased levels of fatigue. In addition, we explored whether these associations would vary for younger versus older breast cancer survivors. **Methods:** Fatigue levels were measured across 5 years for a total of 8 waves as part of a longitudinal study involving breast cancer survivors (N = 171). A total of 15 days of diurnal cortisol secretion were measured in 7 waves. Area under the curve (AUC) and slope were calculated for each day and detrended variability indexes were computed. **Results:** Hierarchical linear modeling revealed that age significantly predicted average fatigue levels among those with high cortisol variability ($|T\text{-}ratios| > -4.07$, $ps < .01$), but not those with relatively low levels of cortisol variability ($|T\text{-}ratios| < -1.23$, $ps > .22$). These findings indicated that younger survivors with high AUC and slope variability reported the highest levels of fatigue. **Conclusions:** Among young breast cancer survivors, day-to-day variability in cortisol AUC and slope can predict fatigue levels following diagnosis. These findings highlight the importance of examining day-to-day variability in cortisol patterns, as they may indicate individuals at risk for disturbances in their psycho-physiological well-being following a cancer diagnosis.

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Abstract 1079
PHYSICAL ACTIVITY MODERATES EVERYDAY-LIFE WITHIN-PERSON ASSOCIATIONS BETWEEN NEGATIVE AFFECT AND SALIVARY CORTISOL IN OLDER ADULTS
Theresa Pauly, MA, Psychology, University of British Columbia, Vancouver, BC, Germany, Victoria I. Michalowski, MA, Psychology, University of British Columbia, Vancouver, BC, Canada, Urs M. Nater, PhD, Psychology, University of Vienna, Vienna, Austria, Denis Gerstorf, PhD, Psychology, Humboldt University of Berlin, Berlin, Germany, Maureen C. Ashe, PhD, Department of Family Practice, Kenneth M. Madden, PhD, Medicine, Christiane A. Hoppmann, PhD, Psychology, University of British Columbia, Vancouver, BC, Canada
Background. Experimental research has demonstrated that individuals with higher physical activity levels show reduced cortisol responses to psychosocial stress. The present study takes this research out of the lab and it extends these findings by investigating whether older adults' physical activity also moderates everyday-life within-person associations between momentary negative affect and concurrent salivary cortisol as they engage in their typical daily life routines and environments.

Methods. A sample of 162 older adults aged 60 to 87 years (*M* age = 72 years; 50% women; 57% Caucasian) completed affect assessments and provided concurrent salivary cortisol samples 4 times per day over 7 consecutive days. Hip-worn accelerometers objectively recorded step counts during this period. Data were analysed using multilevel models, controlling for diurnal cortisol changes and relevant individual difference variables (e.g., age, gender, body mass index, person-average negative affect).
Results. Increased momentary negative affect was associated with higher concurrent cortisol levels ($b = 0.01$, $SE = 0.01$, $p < .01$). Average daily steps moderated these negative affect-cortisol associations in such a way that participants who exhibited higher average daily steps showed a less pronounced increase in momentary cortisol in moments when they reported higher momentary negative affect ($b = -0.01$, $SE = 0.01$, $p = .04$).
Conclusions. Individual differences in older adults' average daily steps buffer cortisol secretion in moments of heightened negative affect. Findings underpin that physical activity modulates neuroendocrine responses to stress in everyday life.

Abstract 1506
THE MOMENTARY AFFECTIVE STATES AND DIURNAL CORTISOL RHYTHM IN MINORITY YOUTH
Cheng K. Fred Wen, Ph.D, Center for Self-Report Science, Chih-Ping Chou, Ph.D, Britni R. Belcher, Ph.D, Preventive Medicine, Marc J. Weigensberg, MD, Pediatrics, David S. Black, Ph.D, Preventive Medicine, Donna Spruijt-Metz, Ph.D, mHealth Collaboratory, Psychology, and Preventive Medicine, University of Southern California, Los Angeles, CA
Background: Affective states could relate to the hypothalamic-pituitary-adrenal axis (HPA) axis activities, but whether the fluctuation in unstimulated affective states could acutely relate to HPA axis is understudied. It is also not known whether time spent in moderate-to-vigorous physical activity (MVPA) or sugar consumption could modify this relationship in youth are understudied.
Methods: In a randomized cross-over trial, youths completed two 8-hour visits to an observation lab. Participants were randomly assigned to receive either high-sugar low-fiber (HSLF) or low-sugar high-fiber (LSHF) meals for the first visit and then received the other condition 2-4 weeks later. During the lab stays, youth provided ratings for 5 affective states, saliva samples every 30 minutes for the first 5 hours, and wore an accelerometer on the waist. Time spent in MVPA during the 30-min interval between the time of affect rating and saliva sample collection at the next 30 minutes were aggregated. Between- and within-person versions of affect ratings and time in MVPA were included in the analytic models as predictors. Log-transformed cortisol values were used in multilevel models to examine the association between affect ratings and cortisol levels at the subsequent 30 minutes. Moderation effects were modeled by interaction terms. All analyses were conducted using Proc Mixed in SAS 9.4.
Results: 87 adolescents (56.8% Latino and 43.2% African American, 49.0% female) overweight and obese (94.3% obese) with a mean 16.3±1.2 years of age completed the study. 2-level model results suggest that both average negative affect (β=0.02, p=0.0343) and time spent in MVPA (β=0.014, p=0.0128) were acutely related to subsequent cortisol level only during the HSLF condition. Similar patterns of associations were identified in models with the feeling of panic as the main predictor. Time-spent in MVPA did not moderate the acute relationship between affect and subsequent cortisol level.
Conclusions: Fluctuations in negative affect can be a psychological demand to youth's HPA axis, but only when they were exposed to meals of high sugar and low fiber contents. These results suggest that the sugar and fiber content of meals may have a role in HPA axis reactivity to psychological demands in youth.

Abstract 1239
THE IMPACT OF PARENTAL CANCER ON MALADAPTIVE STRESS RESPONSES IN CHILDREN
Nadine Melhem, PhD, Benjamin Hayes, BS, Jacob Brent, MD, Psychiatry, Shervin Bazmi, MS, Katarina Gray, BS, Psychology, Giovanna Porta, MS, Psychiatry, Anna Marsland, PhD, Psychology, David Brent, MD, Psychiatry, University of Pittsburgh, Pittsburgh, PA
Background. Childhood adversity is associated with increased risk for depression, posttraumatic disorder (PTSD), a risk that continues into adulthood. This long-lasting impact is attributed to the "reprogramming" or changes in the expression of genes regulating the hypothalamic-pituitary-adrenal (HPA) axis and immune responses, which impact biological and psychological processes. Activation of the HPA axis is an adaptive response to stress; however, when repeatedly activated, HPA axis dysregulation can result. Such dysregulation is associated with both depression and PTSD although a discrepant neuroendocrine profile is described. It is possible that certain neuroendocrine profiles reflect a pre-existing vulnerability that puts individuals at risk for different outcomes in response to stress.
Methods. We examine biological responses in the HPA axis and inflammatory pathways in offspring (n=33) of parents recently diagnosed with cancer and compare them to 26 control offspring whose parents/siblings do not have cancer or severe chronic illnesses. The average time between diagnosis and intake was 64.2 days (Standard Deviation, SD=37.5) and follow-ups were conducted 6 and 9 months later. We measured gene expression, GR sensitivity, hair cortisol concentrations (HCC) to assess chronic HPA axis activity, and salivary cortisol to assess acute HPA axis activity.
Results. Offspring of parents with cancer show higher perceived stress [b=8.4, 95% CI (3.6, 13.2), p=0.001, d=0.68]; depression symptomatology [b=5.3, 95% CI (1.0, 9.6), p=0.015, d=0.45]; higher HCC [b=10.3, 95% CI (6.6, 14.1), p<0.001, d=1.46]; a decrease in HCC over time [b=-0.02, 95% CI (-0.03, -0.01), p<0.001, d=-1.1]; and higher *IL-1b* mRNA [b=0.95, 95% CI 0.39, 1.51), p=0.001, d=0.78]. Higher HCC and total cortisol output were associated with increased depression symptomatology. However, lower total cortisol was associated with increased PTSD symptomatology.
Conclusions. Offspring of parents with cancer show early biological changes in response to diagnosis that puts them at increased risk psychiatric disorders. This study is the first to show evidence of a downregulation of HPA axis activity in response to chronic stress. These results improve our understanding of the biological mechanisms implicated in stress responses, which will help inform novel treatment approaches.

Depression
Friday, March 8 from 4:10 to 5:25 pm

Abstract 1308
GUT LEAKINESS PREDICTS WOMEN'S DEPRESSIVE SYMPTOMS ONE AND TWO YEARS LATER
Annelise Madison, BA, Avelina Padin, MA, Psychology, Janice K. Kiecolt-Glaser, PhD, Psychiatry, Ohio State University, Columbus, OH
Greater intestinal permeability, or "leaky gut," allows gut bacteria to seep into the periphery. Prior research indicates that those with depression tend to have leakier guts compared to non-depressed individuals. However, most studies have been cross-sectional, barring directional conclusions. Depression promotes inflammation, which can erode the gut lining – a top-down pathway. In turn, a leaky gut provokes inflammation, thereby heightening risk for depression – a bottom-up pathway. The current study explored the directionality of the association between leaky gut and depressive symptoms via data from 217 women (n=78 healthy controls, n=139 breast cancer survivors who were six months post-treatment). At three annual visits, women completed the Center for Epidemiological Studies

Depression questionnaire (CES-D) and provided blood samples to assess lipopolysaccharide-binding protein (LBP) and serum soluble CD14 (sCD14), markers of leaky gut. The relative balance of LBP to sCD14 was calculated, as higher ratios promote greater inflammation. Mixed modeling was used to test both the bottom-up (i.e., baseline leaky gut predicting later depressive symptoms) and top-down (i.e., baseline depressive symptoms predicting subsequent leaky gut) pathways. All models adjusted for demographic variables (i.e., age, comorbidities, and BMI), health behaviors (i.e., diet quality, alcohol use, sleep quality, exercise, and smoking status), antidepressant usage, and baseline values of the outcome variable. In separate models, higher baseline LBP (p=0.010) and LBP to sCD14 ratio (p=0.036), but not sCD14 (p=0.53), predicted greater depressive symptoms at later visits. However, baseline depressive symptoms did not predict later LBP (p=0.95), LBP to sCD14 ratio (p=0.16), or sCD14 (p=0.83). Results support the bottom-up pathway, suggesting that a leakier gut fuels greater depressive symptoms among healthy women and breast cancer survivors alike. A leaky gut creates an environment conducive to future mood dysregulation, increasing negative affect in line with the sickness behavior paradigm. This proinflammatory pathway has broad implications for other inflammation-related diseases and disorders, including cardiovascular disease and diabetes. Thus, interventions to fortify the gut barrier may be worthwhile preventative strategies or complements to traditional depression therapies.

Abstract 1745

LUNG CANCER BIOLOGY AND ITS ASSOCIATION WITH DEPRESSION AND SYSTEMIC INFLAMMATION

Daniel C. McFarland, D.O., Devika Jutagir, Ph.D., Psychiatry and Behavioral Sciences, Memorial Sloan Kettering Cancer Center, New York, NY, Christian Nelson, Ph.D., Psychiatry and Behavioral Sciences, Memorial Sloan Kettering Cancer Cener, New York, NY

Background: Depression is associated with inflammatory states and is highly prevalent in lung cancer- a type of cancer with elevated levels of inflammation. Immunotherapy is a new treatment paradigm which relies on the patient's adaptive immunity to fight against cancer. Tumor Mutation Burden (TMB)-the number of cancer mutations-predicts for higher response to immunotherapy. This study evaluated whether higher TMB was associated with depression and various forms of inflammation. Methods: Patients with metastatic NSCLC receiving anticancer treatments were evaluated for depression and anxiety using the Hospital Anxiety and Depression Scale (HADS) while inflammation was evaluated by acute phase reactants(C-Reactive Protein [CRP] and albumin) and the Neutrophil to Lymphocyte Ratio (NLR) and TMB was evaluated using Memorial Sloan Kettering MSK-IMPACT™ (Integrated Mutation Profiling of Actionable Cancer Targets). Results: One hundred of 120 potential participants completed surveys (83.3% response). The average number of mutations was 11 (SD 10.3). Screening criteria were met by 21% for depression and 24% for anxiety. TMB was associated with depression (p=.032) and NLR (p=.002) and was higher for participants meeting depression screening criteria (HADS>8) (16.5 versus 9.2) (p=.01), on immunotherapy (16.2 versus 11.0 [on chemotherapy] or 5.3 [on targeted therapy]), or on second line of treatment (15.4 versus 8.1 [1stline] or 10.6 [3rd line]) (p=.023). In addition to TMB, depression was also associated with elevated NLR (p=.027), CRP (p=.001), and lower albumin (p=.001) and receiving chemotherapy over immunotherapy or targeted therapy (p=.009). A multivariate model was created to predict depression from TMB and inflammatory markers (CRP, albumin, NLR) while controlling for age and sex. This model found that TMB predicted for depression (β=.35, p=.012) while receiving immunotherapy was protective for depression (β=-.41, p=.004). The model accounted for 21.4% of depression score variance (adjusted R^2=.214). Conclusion: TMB was associated with depression and this may be mediated by the adaptive immune system. At the same time, patients receiving immunotherapy had higher TMB but less depression. Thus, both cancer biology and anticancer treatment type affect depression and need to be understood further in order to better address depression in the cancer setting.

VIEW PDF

Abstract 1475

BASELINE FRAILTY PREDICTS SLEEP FRAGMENTATION, SELF-RATED HEALTH, AND DEPRESSIVE SYMPTOMS: RESULTS FROM A NATIONALLY REPRESENTATIVE PROSPECTIVE COHORT OF OLDER ADULTS

Jennifer L. Guida, PhD, Basic Biobehavioral and Psychological Sciences Branch, National Cancer Institute, Rockville, MD, Alfonso J. Alfini, PhD, Department of Mental Health, Jennifer Schrack, PhD, Epidemiology, Adam P. Spira, PhD, Mental Health, Johns Hopkins University, Baltimore, MD, Paige Green, PhD, Basic Biobehavioral and Psychological Sciences Branch, National Cancer Institute, Rockville, MD

Background: Frailty is a risk factor for mortality, but it is unclear how it affects psychosocial wellbeing and sleep. This study aimed to examine the longitudinal relationships between baseline frailty and self-rated health, depression, anxiety, perceived stress, and objectively measured sleep five years later.

Methods: The National Social Life, Health and Aging Project is a cohort of community-dwelling older adults (Wave 1: 2005-2006 and Wave 2: 2010-2011; n=2,257). A frailty composite was constructed using the Activities of Daily Living Scale, Timed Up and Go test, history of fractures, falls, pain, and comorbidities. Depressive symptoms were measured with the Iowa version of the Center for Epidemiologic Studies-Depression Scale. Anxiety and stress were assessed with the Hospital Anxiety and Depression Scale and the Perceived Stress Scale, respectively. Sleep was quantified in a subset of participants by wrist actigraphy for 72-hours (n=522); indices included mean total sleep time, wake after sleep onset (WASO), fragmentation index, and the percentage of the sleep interval spent asleep (% sleep). Sleep models were adjusted for age, sex, race, and education. All other models were additionally adjusted for baseline values of the outcome, physical activity, BMI, and psychotropic medication use.

Results: In unadjusted analyses, participants with higher baseline frailty reported significantly poorer health, higher stress, and a greater number of depressive and anxiety symptoms five years later (p<0.05). In adjusted models, frailty was associated with poorer self-reported health (β=-0.91, 95% CI: -0.52,-1.29) and more depressive symptoms at follow-up (β=2.89, 95% CI: 1.26,4.52). Among participants with actigraphy data, higher levels of baseline frailty were significantly associated with greater WASO, higher fragmentation index, and lower % sleep in unadjusted analyses. After adjustment, frailty was only associated with a higher fragmentation index (β=5.57, 95% CI: 1.66,9.48).

Conclusion: Frailty is an independent predictor of poorer self-rated health, depressive symptoms, and sleep fragmentation in older adults. Interventions aimed at reducing frailty may have the additional benefit of improving quality of life.

Abstract 1605

LONGITUDINAL PERSISTENCE AND DIMENSIONS OF DEPRESSIVE SYMPTOMS: ASSOCIATIONS WITH HAIR CORTISOL AND PLASMA C - REACTIVE PROTEIN.

Eleonora Iob, MSc, Andrew Steptoe, DSC, Behavioural Science and Health, University College London, London, United Kingdom

Background. Chronic life stress plays a key role in the experience of depressive symptoms. Accordingly, there is emerging evidence for a link between depressive symptoms and biomarkers of stress such as cortisol and C-reactive protein (CRP). However, most longitudinal research has focused on transient rather than persistent depressive symptoms. Furthermore, the specific associations of cortisol and CRP

with the cognitive-affective and somatic dimensions of depressive symptomatology remain largely unexplored.
Aim. To investigate the associations of hair cortisol and plasma CRP with the persistence and dimensions of depressive symptoms over a 10-year period.
Method. The data came from a representative sample of older adults from the English Longitudinal Study of Ageing. Depressive symptoms were assessed from wave 1 (2002-03) to wave 6 (2012-13) using the eight-item Centre for Epidemiological Studies Depression (CES-D) scale. Hair cortisol and plasma CRP were measured in wave 6. Covariates included demographic, socioeconomic, and health behaviour characteristics. Trait-state-occasion (TSO) modelling was used to measure the stable variance as well as dimensions of depressive symptoms across time.
Results. Cortisol sample (N=4,772): The TSO model of depressive symptoms had good fit, RMSEA=0.016, CFI=0.998. Higher cortisol was significantly associated with more persistent depressive symptoms (b=0.11, 95%CI: 0.07;0.16). The effect of cortisol was larger on somatic (b=0.16, 95%CI: 0.10;0.22) than cognitive-affective symptoms (b=0.07, 95%CI: 0.01;0.11), and this difference was statistically significant (t = 2.15, 95%CI: 0.01;0.20). CRP sample (N=5,795): The TSO model fit the data well, RMSEA=0.010, CFI=0.999. Elevated CRP was significantly associated with greater persistence of depressive symptoms (b=0.21, 95%CI: 0.16; 0.26). As for cortisol, the difference between the effect of CRP on somatic (b=0.30, 95%CI: 0.24;0.36) and cognitive-affective symptoms (b=0.13, 95%CI: 0.08;0.18) was statistically significant (t=4.38, 95%CI: 0.10;0.25).
Conclusion. Elevated hair cortisol and plasma CRP levels were both associated with more persistent depressive symptoms over a 10-year period. Furthermore, their relationship with somatic symptoms was considerably larger than that with cognitive-affective symptoms.

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Abstract 1119
ASSOCIATION BETWEEN IMMIGRANT STATUS AND ANTIDEPRESSANT USE IN U.S. ADULTS: NHANES 2005-2014
Jay S. Patel, MS, Loretta Hsueh, MA, Brittanny M. Polanka, MS, Kaitlyn T. Walsh, BS, Jesse C. Stewart, PhD, Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN
Despite advances in depression care, disparities across racial/ethnic groups remain. It is unclear whether immigrant groups in the U.S. are also at increased risk for such disparities. **Objective:** To examine the association between immigrant status and antidepressant use in a U.S. representative sample. **Methods:** We used data from the National Health and Nutrition Examination Survey (NHANES) 2005-2014, a cross-sectional epidemiologic study designed to assess the health status of the U.S. population. Respondents were 30,295 adults. Immigrant status was indicated by birth within (U.S.-born) or outside (foreign-born) the 50 U.S. States or Washington, D.C. Medication data were recorded by NHANES interviewers, who were shown the original containers of any medication taken in the last 30 days. From these data, we created a past-month antidepressant use variable (0=no, 1=yes). Analyses were conducted in MPlus using robust full information maximum likelihood (FIML) to account for missing data. Logistic regression models were adjusted for demographic factors (age, sex, race/ethnicity, education, family income ratio, and marital status) and depression-related factors (depression severity, as measured by the PHQ-9, and daily alcohol intake). **Results:** 13.7% of U.S.-born and 4.3% of foreign-born adults used antidepressants in the past month. Compared to their U.S.-born counterparts, foreign-born adults had 58% lower odds of antidepressant use in the demographics-adjusted model (*OR*=0.42, *95% CI*: 0.35-0.51, p<0.001) and 55% lower odds in the fully-adjusted model (*OR*=0.45, *95% CI*: 0.37-0.55, p<0.001). In the subsample of 2,409 respondents with clinically significant depressive symptoms (PHQ-9 ≥ 10), 36.6% of U.S.-born and 13.4% of foreign-born adults used antidepressants in the past month, and foreign-born adults had 65% lower odds of antidepressant use (fully-adjusted model: *OR*=0.35, *95% CI*: 0.24-0.53, p<0.001). **Conclusions:** Foreign-born adults in the U.S. have a lower odds of antidepressant use, perhaps due to person (patient preferences), provider (depression screening rates), and/or system (healthcare access) factors. Because depression is an emerging risk factor for obesity, diabetes, and cardiovascular disease, future research should examine if lower rates of antidepressant treatment in U.S. immigrants may contribute to this group's higher cardiometabolic disease risk.

Diabetes
Thursday, March 7 from 11:00 am to 12:00 pm

Abstract 1610
WEIGHT CHANGE IN DEPRESSION AND ONSET OF TYPE 2 DIABETES
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Background: Several meta-analyses have shown that depression is associated with an increased risk of Type 2 diabetes. However, depression is a highly heterogeneous disorder that includes diverse symptoms. Individuals who experience depressive symptoms related to poor metabolic health, such as weight gain, may be more likely to develop Type 2 diabetes. This work compares diabetes development in individuals with recent depression that included weight gain, weight loss, or no weight change and in those with no recent depression.
Methods: 47,594 participants aged 18 to 65 were drawn from the Canadian National Population Health Survey (1996) and the Canadian Community Health Survey (2000/2001, 2003). Past 12-month depressive episodes and symptoms from the worst episode were measured using the Composite International Diagnostic Interview – Short Form (CIDI-SF). Participants were categorized as having a depressive episode that included weight gain, weight loss, or no weight change, or no recent depressive episode. Participants were followed for up to 21 years (until March 2017) to determine diabetes incidence using physician claims and hospital billing data. Cox proportional hazards regression compared diabetes incidence between groups, adjusting for demographic, lifestyle, and health-related covariates. Normalized weights were applied to account for sampling probabilities.
Results: Approximately 7.8% of the sample experienced a depressive episode in the past year. Depression that included weight gain was associated with a higher risk of incident diabetes compared to depression with weight loss (HR 1.60, 95% CI 1.06-2.40), depression with no weight change (HR 1.40, 95% CI 1.03-1.90), and no depression (HR 1.74, 95% CI 1.34-2.25). Depression with no symptoms of weight change was associated with a higher risk of diabetes compared to no depression (HR 1.24-, 95% CI 1.04-1.49). Depression with weight loss was not associated with an increased risk of diabetes. When adjusting for baseline BMI (n=43,504), there were no significant differences between groups.
Conclusions: Depressive episodes that include weight gain may be more strongly linked to the development of Type 2 diabetes than other depressive subtypes. These findings have implications for the identification of individuals at higher risk of Type 2 diabetes and the development of personalized prevention strategies.

Abstract 1351

BASELINE CARDIOMETABOLIC IMPAIRMENT SEVERITY AND IMPROVEMENTS IN GLUCOREGULATION AND INFLAMMATION AMONG TREATMENT SEEKING OBESE ADULTS

Caitlin E. Smith, MS, Misty Hawkins, PhD, Psychology, Oklahoma State University, Stillwater, OK

Background: Obesity is associated with increased risk for cardiometabolic disease via altered glucose/insulin response and elevated inflammation. Weight loss is a recommended treatment; however, it is unknown if the severity of cardiometabolic impairment prior to weight loss treatment impacts treatment outcomes. The present study examined the association between markers of glucoregulatory function and inflammation across a 6-month behavioral weight loss program. Our objective was to determine if the severity of baseline cardiometabolic impairment is associated with differential outcomes in glucoregulatory function and inflammation at post-treatment. **Methods:** The sample consisted of 99 obese adults (aged 45.53±11.16 years; 74% female; 22% non-white) enrolled in the ongoing COSMOS behavioral weight loss program (Identifier: NCT02786238). Participants were categorized into one of four cardiometabolic impairment severity groups using baseline hsCRP (>=3 [high CVD risk] or < 3 mg/L) and fasting blood glucose (>= 100 [prediabetes/diabetes range] or < 100 mg/dL). Percent change variables were calculated using baseline and 6-month post treatment blood samples to index changes in glucoregulation (fasting glucose/insulin, insulin resistance, and HbA1c) and inflammation (IL-6, hsCRP, and TNFalpha). Covariates were age, sex, baseline BMI, and percent weight loss across the 6-month program. **Results:** ANCOVA analyses indicated a significant effect of baseline cardiometabolic impairment group on change in glucose $F(3,64) = 4.11$, $p < .01$, insulin $F(3,65) = 3.38$, $p < .05$, HbA1c $F(3,64) = 3.76$, $p < .05$, and hsCRP $F(3,64) = 2.87$, $p < .05$. No effects were found for insulin resistance, IL-6, or TNFalpha. **Conclusions:** Participants with the highest cardiometabolic impairment, as indexed by high risk for CVD and diabetes, exhibited the greatest improvements in glucose, insulin, HbA1c, and hsCRP across treatment when compared to participants with less severe impairment. These effects were present even when covarying for percent weight loss, suggesting that improvements in glucoregulatory function and inflammation were detected independent of weight loss and especially among high risk participants. Future studies exploring the specific mechanisms by which glucoregulatory function and inflammation improve within this high risk population are warranted.

Abstract 1201

SEX DIFFERENCES IN INTERLEUKIN-6 STRESS RESPONSES IN PEOPLE WITH TYPE 2 DIABETES

Laura Panagi, MSc, Lydia Poole, PhD, Ruth A. Hackett, PhD, Andrew Steptoe, DSc, Behavioural Science and Health, University College London, London, United Kingdom

Background: The innate immune system participates in the acute stress response by releasing inflammatory cytokines, including interleukin(IL)-6. Women with type 2 diabetes (T2D) have higher rates of some inflammatory-related conditions compared to their male counterparts. One plausible physiological mechanism involves larger IL-6 stress responses, but the effect of sex on IL-6 responsivity in people with T2D remains to be examined.

Purpose: The purpose of this study was to examine differences in IL-6 responses to acute stress between older men and women with T2D.

Methods: One-hundred and forty participants (88 men; mean age = 64.09 [SD = 7.35], 52 women; mean age = 63.20 [SD = 6.70]) with doctor-verified T2D diagnosis took part in laboratory-based stress testing. Exclusion criteria included history or previous diagnosis of coronary heart disease, inflammatory diseases, allergies, or mood disorders. In the laboratory, participants underwent two 5-minute mental stress tasks; the mirror tracing and the Stroop task. Blood was sampled at baseline, immediately post-task, and 45 and 75 minutes post-task to detect plasma IL-6 concentrations. Three IL-6 change/response scores were computed to reflect the mean difference between the baseline measurement and the three time points post-stress. Main effects and interactions were tested using mixed model analysis of covariance.

Results: We found a significant main effect of time for the IL-6 levels and a significant sex by time interaction. In adjusted analysis including the three change scores and all the covariates, the significant sex by time interaction was maintained; IL-6 stress responses were greater in women at 45 minutes and 75 minutes following stress compared with men adjusting for age, body mass index, smoking, household income, glycated hemoglobin, oral anti-diabetic medication, insulin/other injectable anti-diabetic medication, depressive symptoms, and time of day of testing.

Conclusions: Different inflammatory stress response pathways are present in men and women with T2D, with women producing larger IL-6 increases. These sex differences in the magnitude of responses may implicate different levels of inflammatory-related disease vulnerability in this population.

Abstract 1057

UNDIAGNOSED DIABETES AMONG IMMIGRANT AND RACIAL/ETHNIC MINORITY ADULTS IN THE U.S.: NHANES 2011-2016

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Undiagnosed diabetes disproportionately affects medically underserved populations, including racial/ethnic minorities. It is unknown whether immigrant status confers additional risk for undiagnosed diabetes.

Objective: To examine independent associations of immigrant status and race/ethnicity with the prevalence of diagnosed and undiagnosed diabetes in a large sample representative of the U.S. population.

Method: Respondents were 16,157 adults (mean age=48 years, 52% female) from the 2011-2016 National Health and Nutritional Exam Survey (NHANES). Immigrant status was coded as foreign-born (31%) or U.S.-born (69%). Six NHANES racial/ethnic categories were: non-Hispanic White (37%), non-Hispanic Black (22%), Mexican American (14%), other Hispanic (11%), non-Hispanic Asian (12%), and other/multiracial (3%). Using self-report and laboratory data, we created a three-level outcome variable: no diabetes, diagnosed diabetes, and undiagnosed diabetes.

Results: Of the 2,522 (16%) respondents with diabetes, 2061 (13%) had received a diabetes diagnosis ("diagnosed diabetes") and 461 (3%) had not ("undiagnosed diabetes"; Table 1). Multinomial logistic regression models (Table 2) – that included immigrant and race/ethnicity as simultaneous predictors and adjusted for age, sex, education, BMI, health insurance status, and NHANES sampling design – revealed foreign-born (vs. U.S.-born) adults had a similar prevalence of diagnosed diabetes (13.1% vs. 12.6%; *OR*=0.88, 95% *CI*: 0.76-1.03) but a higher prevalence of undiagnosed diabetes (4.1% vs. 2.3%; *OR*=1.43, 95% *CI*: 1.20-1.70). Foreign-born adults also had higher odds of undiagnosed vs. diagnosed diabetes (*OR*=1.62, 95% *CI*: 1.25-2.10).

Models also showed that all racial/ethnic minority groups (vs. Whites) had a higher prevalence of both diagnosed and undiagnosed diabetes, except the other/multiracial group for undiagnosed diabetes (*p*s < 0.02; Tables 1 and 2). However, the odds of undiagnosed vs. diagnosed diabetes differed only between Asians and White, in that Asians had higher odds of undiagnosed vs. diagnosed diabetes (*OR*=1.72, 95% *CI*: 1.05–2.81).

Conclusions: Immigrants and racial/ethnic minority adults are at higher risk for undiagnosed diabetes, even after taking health

insurance status into consideration. Thus, these groups are likely at increased risk for diabetes complications due to prolonged periods of undetected diabetes.

VIEW PDF

Discrimination
Thursday, March 7 from 9:30 to 10:45 am

Abstract 1691
INDIVIDUAL-LEVEL DISCRIMINATION INTERACTS WITH DEPRESSIVE SYMPTOMS TO PREDICT INTIMAL-MEDIAL THICKENING IN AFRICAN AMERICANS

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African Americans (AA) have a 3x greater stroke risk between the ages of 45 and 65, relative to Whites. Coupling of an interpersonal, socially-based susceptibility (discrimination) with an intrapersonal psychological vulnerability (depressive symptoms) may contribute to AA greater risk. However, rarely are the joint effects of discrimination and depression considered in health disparities research. We examined independent and interactive relations of dimensions of discrimination and depressive symptoms to carotid intimal-medial thickness (CIMT), a subclinical marker of atherosclerosis prospectively implicated in stroke incidence. Participants were 1,097 urban-dwelling midlife to older (30-64 years old) adults (52.1% women; 59.6% lower socioeconomic status [SES]) from the Healthy Aging in Neighborhoods of Diversity across the Life Span study who underwent carotid ultrasonography and completed the Center for Epidemiologic Studies Depression (CES-D) Scale and measures of discrimination across 4 dimensions – everyday, social statuses, racial, and lifetime. The four dimensions respectively reflect; a) day to day indignities, b) bias associated with social statuses (e.g., age, sex, appearance) one occupies, c) race, and d) overall lifetime burden of discrimination. Cross-sectional hierarchical regression analyses examined each discrimination variable (in separate models) with CES-D and adjusted for age, sex, SES, hypertension, diabetes, cardiovascular disease (CVD), total cholesterol, lipid-lowering medications, body mass index, and lifetime substance use. Findings revealed two, 2-way interactions for Discrimination x CES-D: 1) greater social status-based discrimination ($p = .01$) and 2) lifetime burden discrimination ($p = .02$) were associated with greater CIMT in AA with greater depressive symptoms. Also, greater everyday discrimination (irrespective of CES-D) was positively associated with CIMT ($p = .02$). These novel findings suggest that joint exposure to multidimensional discrimination and depressive symptoms – two sources of chronic stress – uniquely contribute to atherosclerosis among AA. It is important that these linkages are present in midlife – a critical period for CVD and stroke risk in AA. Longitudinal work is needed to assess the temporal associations among these measures, and explore howthey may serve as forms of sociocultural-based CVD risk for AA.

Abstract 1660
RELIGIOUS AFFILIATION STATUS INFLUENCES THE RELATION OF DISCRIMINATION TO PULSE WAVE VELOCITY AMONG AFRICAN AMERICAN MEN

Jason J. Ashe, MDiv, Daniel K. Leibel, MA, Psychology, University of Maryland, Baltimore County, Baltimore, MD, Shari R. Waldstein, PhD, Psychology, University of Maryland, Baltimore County, Geriatric Research Education and Clinical Center, Baltimore Veterans Affairs Medical Center, Baltimore, MD, Antione D. Taylor, MA, Psychology, University of Maryland, Baltimore County, Baltimore, MD, Michele K. Evans, MD, Alan B. Zonderman, PhD, Epidemiology and Population Science, National Institute of Aging, Baltimore, MD, Danielle L. Beatty Moody, PhD, Psychology, University of Maryland, Baltimore County, Baltimore, MD

In the U.S., African American (AA) men are set apart from other races and women with respect to their disproportionate burden and accelerated onset of cardiovascular disease (CVD), limited use of healthcare services, and reliance on social support in response to stress and illness. Compared to African American women and Whites, AA men further report higher rates of discrimination, an established chronic stressor, but little is known about sociocultural sources of resilience that may be central to the AA male experience. In that regard, religious affiliation has been integral to the AA community and AA men have long demonstrated devout membership and leadership among AA religions. Here, we address whether religious affiliation moderates the adverse relation of discrimination with pulse wave velocity (PWV), a subclinical marker of arterial stiffness that predicts CVD incidence and mortality. In 582 urban-dwelling, midlife (ages 30-65) AA men drawn from the Healthy Aging in Neighborhoods of Diversity across the Life Span study in Baltimore, Maryland, overall lifetime discrimination burden and racial discrimination, and religious affiliation status (yes/no) were assessed. Participants also underwent a carotid-femoral PWV assessment via transcutaneous Doppler probes. Linear regression models examined the interactive relations between the respective discrimination indices and religious affiliation status to PWV after adjustment for age, poverty status, depressive symptoms, body mass index, cigarette and alcohol use, and hypertension. Findings revealed two, 2-way interactions of Discrimination x Religious Affiliation: 1) greater lifetime discrimination burden ($p = .01$); and 2) racial discrimination ($p = .03$) were associated with lower PWV among men who endorsed a religious affiliation. These findings suggest that religion may buffer the onslaught of racial discrimination specifically, and the burden of discrimination overall across the lifetime as related to CVD risk and underscore the sociohistorical impact of religion in the lives of AA men. Future research should explore specific dimensions of religiosity (religious service attendance, prayer, reading sacred text) to further explicate its linkage with multidimensional discrimination and CVD and determine how faith-based community prevention strategies may aid in mitigating the CVD burden of AA men.

Abstract 1024
PARASYMPATHETIC ACTIVITY IN INDIGENOUS PEOPLES DURING A DISCRIMINATION EXPERIENCE SPEAKING TASK

Chad Danyluck, PhD, Colorado School of Public Health, University of Colorado Anschutz Medical Campus, Aurora, CO, Elizabeth Brondolo, PhD, Psychology, St. John's University, Queens, NY, Mark L. Laudenslager, PhD, Psychiatry, Stacie L. Daugherty, MD, Division of Cardiology, Spero M. Manson, PhD, Colorado School of Public Health, University of Colorado Anschutz Medical Campus, Aurora, CO, Charles M. Judd, PhD, Irene V. Blair, PhD, Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO

Discrimination is a stressful event. Yet people targeted with discrimination vary in their perceptions of and responses to it. A factor that may moderate responses to discrimination is generalized anxiety. People with generalized anxiety are more likely to display

low parasympathetic nervous system (PNS) activity and elevated heart rate at rest, suggesting they may be more susceptible to high stress when faced with discrimination. We investigated this hypothesis in a multi-method study of 275 urban-dwelling Indigenous people, who completed a measure of generalized anxiety and later spoke about a time when they experienced discrimination. Stress was assessed through the withdrawal of PNS activity, as measured by respiratory sinus arrhythmia. PNS activity withdrew in all participants during the discrimination stressor, but especially for those with more generalized anxiety. Because discrimination against Indigenous people can be common and high PNS withdrawal can predict worse health, our finding suggests that minorities with more generalized anxiety may be particularly at risk for stress-related illness and in need of greater healthcare and social support from their community.

Abstract 1718

DISPOSITIONAL CHARACTERISTICS AS CORRELATES OF HEALTH AND WELLBEING AMONG MARGINALIZED AND INDIGENOUS COMMUNITIES IN VANCOUVER, CANADA.

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Introduction: Sense of purpose, conscientiousness, and agreeableness are correlated with the health and wellbeing of an individual. However, there is minimal research on these relationships in marginalized and Indigenous communities of Canada. Knowledge of these relationships would enrich our understanding of health outcomes in these communities whom are negatively impacted by various social determinants of health. We sought to determine whether personality variables hold similar associations on health and wellbeing in a marginalized group, and between Indigenous and non-Indigenous participants within this group, living in Vancouver, BC.

Methods: We collaborated with the Indigenous community of Vancouver to ensure cultural safety in survey design. We recruited 300 marginalized participants (150 Indigenous and 150 non-Indigenous, average age 49yrs, and 58% male) from various clinics/centres in Vancouver. Majority of participants had relatively low income (< $15000) and educational attainment (< highschool). Participants completed measures of the Big 5 Personality traits, the Oregon Brief Purpose scale, Satisfaction with Life scale, and SF-6 measure of general health. Correlational analysis determined associations with SF-6 and satisfaction responses.

Results: Correlations were similar between Indigenous and non-Indigenous groups: SF-6 was significantly correlated with sense of purpose (0.337 and 0.283, p<0.001), and conscientiousness (0.222 and 0.227, p<0.001), but not with agreeableness (p=0.325 and p=0.035); satisfaction was correlated with sense of purpose (0.580 and 0.553, p<0.001) and conscientiousness (0.288 and 0.202, p<0.001).

Conclusion: Similar to other populations, personality and purpose are factors worth considering when understanding health and wellbeing of marginalized and Indigenous communities of Vancouver. We are now investigating these relationships among individuals living with chronic health conditions.

Abstract 1331

DISCRIMINATION AND DAILY ACTIVITIES DURING ADOLESCENCE

Danny Rahal, MA, Psychology, UCLA, Los Angeles, CA, Virginia Huynh, PhD, Psychology, California State University, Northridge, Northridge, CA, Michael R. Irwin, PhD, Andrew J. Fuligni, PhD, Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA

Background: Discrimination has been robustly linked with poorer health outcomes and experiencing more negative daily events (Ong, Fuller-Rowell, & Burrow, 2009; Priest et al., 2013; Sanders-Phillips et al., 2009). The consequences of both discrimination and anger for wellbeing are observed among adolescents (Nair et al., 2013; Quinn et al., 2014). In this study, we assessed the extent to which discrimination relates to arguments and getting along with closers others, and whether these associations are explained by anger and positivity. **Method**: A sample of predominately Asian American, Latino, and European Americans adolescents (N=340; 56.17% female) participated in up to three time-points, two years apart, in a longitudinal study between the 10th grade and three years out of high school. Participants reported how frequently they experienced discrimination over the past year using the Everyday Discrimination Scale (Williams et al., 1997; αs = .84-.88). They also reported their proneness to anger using the State-Trait Anger Expression Inventory (Spielberger, 1996; αs = .84-.88) and positivity using the joviality subscale of the PANAS-X (Watson et al., 1988; αs = .96-.97). Over 14 days, participants reported whether they experienced arguments with and whether they got along with family and friends. Three-level multilevel models (days nested within years nested within participants) were used to assess how discrimination relates to affect and daily events, controlling for gender, ethnicity, and parental education. **Results**: Late adolescents experiencing more discrimination had higher anger, b = 0.30, se = 0.03, p < .001, and lower positivity, b = 0.21, se = 0.06, p = .001. Moreover, they reported more daily arguments, b = 0.02, se = 0.004, p < .001, and fewer times getting along with others each day, b = -0.03, se = 0.01, p = .012. Anger partially mediated the association between discrimination and arguments, b = 0.01, se = 0.002, p = .003 While positivity was related to getting along with others, it did not mediate the association between discrimination and getting along with others, b = 0.00, se = 0.002, p = .058. **Discussion**: Discrimination is related to differences in affect among adolescents. However, discrimination uniquely affected arguments and getting along with others, suggesting that these pathways were not driven purely by affect.

Emotion

Saturday, March 9 from 3:30 to 4:30 pm

Abstract 1273

STRESSED? MAYBE SKIP THE COFFEE: THE INTERACTIVE EFFECTS OF CAFFEINE AND CHRONIC STRESS ON RESPONSES TO EMOTIONAL STIMULI

Lydia G. Roos, MA, Health Psychology PhD Program, Alexandria R. Stone, BS, Sara M. Levens, PhD, Jeanette M. Bennett, PhD, Psychological Sciences, University of North Carolina at Charlotte, Charlotte, NC

Background: Caffeine is a widely-used psychoactive, sympathetic nervous system stimulant and is associated with a range of psychological effects, including changes in stimulus processing and mood. Additionally, exposure to chronic stress is associated with greater appraisals of stressors as threatening. Nonetheless, no known research has explored whether caffeine affects how chronic stress exposure changes responses to emotional stimuli.

Method: The current investigation is part of a larger, double-blind, placebo-controlled study in which participants provided positive and negative ratings of emotion-eliciting photographs after being administered caffeine or placebo. The sample included 126

participants (81.0% female) aged 18-48 (average age 21.38 yrs ± 5.41). Hierarchical multiple regressions controlling for sex, caffeine/placebo order, caffeine use, and caffeine dose examined whether self-reports of chronic stress altered ratings of positive and negative photos.

Results: When examining the change in negative ratings between placebo and caffeine days, participants with higher chronic stress scores displayed greater negative emotional reactivity to emotion-eliciting stimuli between visits (ΔR^2=.10, p<.001). In contrast, chronic stress was not associated with changes in positive ratings to positive photos when given either caffeine or placebo (n.s.). Post-hoc analyses revealed excessive work demands were driving the association with negative photo ratings (ΔR^2=.10, p<.001); excessive work demands also appear to alter negative emotional reactivity to positive photos (ΔR^2=.03, p<.06), suggesting that ingesting caffeine may lead to altered perceptions of emotive stimuli for people who feel overextended at work.

Conclusions: Results contribute to understanding how work stress and a widely-used, exogenous sympathomimetic interact to influence emotions. Specifically, findings suggest that when chronically stressed at work, caffeine use may contribute to more global negative affect because of a negatively biased perceptual lens.

Abstract 1329

RESTING HEART RATE VARIABILITY AND AVOIDING EMOTIONAL EXPERIENCES: THE DIFFERENTIAL ROLE OF TRAIT ANXIETY BETWEEN SEXES.

Nicholas p. Joseph, M.A, Clinical Psychology, DeWayne P. Williams, Ph.D, Psychology, The Ohio State University, Columbus, OH, Julian Koenig, Ph.D, Child and Adolescent Psyciatry, University of Heidelberg, Heidelberg, Germany, Julian F. Thayer, Ph.D, Psychology, The Ohio State University, Columbus, OH

The need for affect (NA) is defined as the motivation to approach (NA-approach) and not avoid (NA-avoid) emotional inducing experiences. Research suggests that avoiding emotional inducing experiences should be associated with psychopathology, including anxiety. Conversely, the motivation to approach emotions is associated with better psychological and physiological outcomes. Resting high frequency heart rate variability (HF-HRV) is a noninvasive measure of psychological and physiological well-being. In a previous study, we found that lower resting HF-HRV was associated with a greater motivation to avoid emotional inducing situations. In addition, prior studies suggest that anxiety is linked to both lower resting HF-HRV, greater NA-avoid, and lesser NA-approach. Thus, the current study evaluates the possible complex association between resting HF-HRV, trait anxiety, and the need for affect, including NA-approach and NA-avoid individually, split by sex. In this study, 146 undergraduate participants (82 female, 64 ethnic minorities) completed a 5-minute baseline resting period, followed by the 26 item NA questionnaire (13 items) subscales. Participants then completed the 20 item Spielberger trait anxiety inventory. Results showed NA-avoid to be a mediator on the link between resting HF-HRV and trait anxiety (B = -1.11 (SE = .60), [-2.46, -.10], p <.05) for males, but this model was not significant for females (B = -.34 (SE = .46), [-1.35, .51], p > .05 . However, trait anxiety was a significant mediator for on the link between resting HF-HRV and NA-avoid (B = -2.20 (SE = 1.02), [-4.85, -.66], p <.05), for females but not for males (B = -.30 (SE = .46), [-1.23, .67], p > .05). No significant results were found surrounding NA-approach. In other words, anxiety served as an outcome variable for avoiding emotions in men, whereas in women, anxiety served as a mediator for avoiding emotions. This suggests that avoiding emotions may *precede* anxiety in men, but are a *result* of anxiety in women; however future research is needed to support this claim directly. Given the current findings, it is possible that this study might highlight sex differences in emotion regulation processing and related psychological outcomes.

Abstract 1128

PHYSIOLOGICAL AND EMOTIONAL RESPONSES TO ANGER RECALL IN SOCIALLY INHIBITED ADULTS

Stefanie Duijndam, MSc, Nina Kupper, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Netherlands

Background: Social inhibition (SI) refers to a broad and stable personality trait, characterized by three underlying facets: inhibition, sensitivity, and withdrawal. How these facets are related to mental stress, is still unknown. We therefore investigated the association of SI with physiological and emotional stress responses.

Methods: 141 Undergraduate students and 29 adults of the general population completed the SIQ15 and participated in the Anger Recall task, while cBP, EDA, ECG and ICG were recorded. Negative and positive emotions were assessed before and after the Anger Recall task. Analyses were performed using repeated-measures-ANOVA, adjusted for the effects of sex.

Findings: A significant quadratic within-subjects association was found between SI and RMSSD (F=4.39;p=.038), with inhibition contributing the most (F=4.64;p=.033). SI showed a significant linear within-subject effect on the DBP stress response and recovery (F=6.08;p=.015), and sensitivity contributed the most (F=7.27;p=.008). There also was a linear within-subject effect of SI on the positive emotional response (F=5.56;p=.020). Sensitivity had the strongest contribution (F=6.219;p=.014). In addition, a significant between-subject effect on PEP was found for SI (F=6.388;p=.013), with inhibition contributing the most (F=8.41;p=.005). Significant between-subject effects on the negative emotional response were found for inhibition (F=6.45;p=.012) and sensitivity (F=19.38;p<.001). No differences associated with SI were observed for IBI, LVET, SBP and SCL.

Discussion: Results suggest SI to be associated with increased DBP and negative mood reactivity, and decreased positive mood (especially sensitivity). Also, SI was associated with a delayed recovery in DBP and sympathetic arousal (PEP), which may indicate failure to shut off allostatic activity after stress.

Abstract 1353

IS RECALL BIAS SIMILAR FOR EMOTIONS AND PAIN? EVIDENCE FROM STUDIES AMONG PATIENTS WITH CHRONIC PAIN

Marta Walentynowicz, PhD, Psychological Sciences Research Institute, Université catholique de Louvain, Louvain-la-Neuve, Belgium, Stefan Schneider, PhD, Dornsife Center for Self-Report Science, Arthur A. Stone, PhD, Center for Self-Report Science, University of Southern California, Los Angeles, CA

Background

When asked to report on their pain in the past week, patients often recall it as more intense than they experienced it. This recall bias also appears for other domains assessed in clinical settings: positive (PA) and negative affect (NA). However, until now the cross-domain consistency and temporal stability of recall bias have not been investigated. This study addresses this gap by exploring recall bias for pain, NA, and PA in patients with chronic pain.

Methods

This study reports secondary analyses of two ecological momentary assessment studies. Chronic pain patients (Study 1, n=116; Study 2, n=68) rated the intensity of momentary pain, PA, and NA several times a day for two weekly periods, either 3 months apart (S1) or administered consecutively (S2). Recall ratings were collected at the end of each week. Recall bias was defined as the discrepancy between the 7-day recall and the mean real-time ratings. The cross-domain consistency and temporal stability were tested with correlations. Mixed ANOVAs explored the magnitude of recall bias in relation to personality traits (anxiety, depression, neuroticism).

Results

On average, the 7-day recall was higher than the average momentary ratings for pain, PA, and NA. The recall bias was moderately stable over time, with test-retest reliabilities over 3 months of .53 (pain), .53

(PA) and .31 (NA). The correlations between recall bias for pain, PA, and NA were mostly not significant. Individual differences in recall bias for PA and NA were related to personality traits (S1), such that higher levels of anxiety/depression/neuroticism were related to greater overreporting of NA and less overreporting of PA. However, this was not replicated in S2. Patients who were more anxious and depressed reported higher momentary and recalled pain, but recall bias for pain was not related to personality traits.

Conclusions

This study provides evidence of recall bias for both pain and affect ratings in chronic pain patients. Individual differences in recall bias were not consistent across domains suggesting that recall bias is not a general phenomenon. Therefore, it cannot be assumed that patients who retrospectively overreport pain will also overreport other experiences. The current study opens important avenues for future research regarding mechanisms underlying recall bias.

Health Behaviors

Saturday, March 9 from 1:45 to 3:15 pm

Abstract 1434

THE DAY-LEVEL ASSOCIATION BETWEEN AFFECTIVE STATES, SELF-REPORTED TIME IN EXERCISE, AND DIURNAL CORTISOL RHYTHM IN ADULTS IN THE UNITED STATES

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Background: Affective states could relate to the hypothalamic-pituitary-adrenal axis (HPA) axis activities, but whether affects of different levels of arousal could relate to HPA axis activities differently and whether the affect-HPA axis relationship can be moderated by exercise are less known.

Methods: Adults from the National Study of Daily Experience provided ratings for their affective states using the 27-item modified Positive and Negative Affect Schedule and estimated their time spent in exercise for the day during end-of-day phone interviews for 8 days. On day 2-5, they also provided saliva samples upon awakening, 30-min post-awakening, lunchtime, and bedtime. Items for calculating average high/low arousal positive and negative affects were identified using principal component analyses with orthogonal rotation. Between- and within-person versions of affect ratings and time spent in exercise were calculated and included in the analytic models as predictors. Log-transformed cortisol values were used in models how affect ratings relate to the diurnal cortisol slope(DCS). Subsequent day cortisol awakening response(CAR) was quantified by the incremental area under the curve methods. 3-level and 2-level multilevel models(MLM) were used to estimate how affect relate to same day DCS and next day CAR, respectively, using SAS 9.4.

Results: 1203 adults (92.3% White, 56.6% female) with a mean 55.9 years of age were included in the analytic sample. Results from MLM for DCS suggest that, at the within-person level, affects were not related to DCS on the same day, but time-spent in exercise was related to 0.013% (β=0.000133, p=0.0192) flatter DCS. MLM for CAR models showed that only high arousal positive affect ratings (average of the feelings of cheerful and in good spirit), not average positive affect ratings, were related to a blunted CAR (β=-0.0211, p=0.0384) on the next morning. Time-spent in exercise did not moderate the relationship between affect and DCS or CAR.

Conclusions: Both specific aspects of affective states and time-spent in exercise could be partially related to the HPA axis in adults, but the later did not moderate the affect-HPA axis relationship. Results may suggest that the feeling of cheerful and other related affect are salient targets for future interventions that aim to reduce the impact of cortisol exposure and health.

Abstract 1124

EXPLORING THE EFFECTS OF PHYSICAL ACTIVITY AND PSYCHOLOGICAL STRESS ON THE PREVALENCE OF PSYCHOLOGICAL AND PHYSICAL HEALTH CONDITIONS IN A NATIONALLY REPRESENTATIVE SAMPLE

Benjamin A. Hives, BKIN, Eli Puterman, PhD, School of Kinesiology, University of British Columbia, Vancouver, BC, Canada

Introduction: Physical activity (PA) and chronic psychological stress (stress) have both been found to have significant - and opposing - relationships with morbidity and mortality. While PA improves the healthspan and lifespan, stress can wear down our physiological systems, advancing aging and disease pathogenesis. In Canadians, approximately 20% are physically active and nearly 25% are highly stressed. The interrelationship of stress and PA and the subsequent effects on physical and psychological health are understudied.

Purpose: This study investigated both the main and interaction effects of PA and stress on health status of Canadians using a nationally representative sample.

Methods: Data from the 2014 Canadian Community Health Survey – Annual Component which included 63,511 participants were used for this study. The variables selected were PA from active transport and leisure time, the Statistics Canada one-item chronic stress measure, age, sex, and reported occurrences of eighteen psychological and physical chronic health conditions. Number of health conditions were summed, log-transformed due to skewness, and regressed on PA, stress, their interaction, and covariates age and sex. Follow-up binary logistic regression analyses for each condition were also completed.

Results: There were significant main effects for PA and stress and an interaction effect for the multiple condition score after controlling for age and sex ($R^2 = .18$, $p < .001$). Simple slope analyses revealed that high stress was related to a greater number of chronic conditions at low levels of PA ($\beta = .19$, SE = .01, $p < .001$), significantly greater than the effects of stress at higher levels of PA ($\beta = .15$, SE = .01, $p < .001$). Stress (OR range: 1.28 to 3.24) showed significant main effects for all but three chronic conditions, while PA (OR range: 0.78 to 0.91) was significantly related ten of the conditions after adjusting for multiple comparisons. No significant interactions were evident for each disease alone.

Discussion: While there were no significant interactions between stress and PA on the development of individual chronic health conditions, there was a significant interaction in predicting multiple morbidities. This may suggest that the interaction of low PA and high stress leads to an environment in the body that fosters the development of chronic conditions without specificity.

Abstract 1220

SEX DIFFERENCES IN THE STIMULATED CYTOKINE RESPONSE TO AEROBIC EXERCISE TRAINING

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Background

Consistent with many studies, we have shown that high but not moderate intensity aerobic exercise training *attenuated* the TNFα response to LPS stimulation in a study of 61 (51 women) young, healthy, sedentary adults (Study 1). More recently, we reported the opposite: in a similar but larger sample (63 women, 56 men), exercise training *enhanced* the TNFα response to LPS (Study 2). Here, we attempt to account for these apparently inconsistent findings.

Method
Participants (20-45 years old) in both studies were randomized to a 12-week, 3-4 sessions/week, aerobic training program or a control condition. They trained at 55-65%, 65-75%, and at 75% of maximum heart rate in weeks 1-2, 3-4, and 5-12 respectively. VO_2max and LPS-induced TNFα release were measured at study entry and at the end of training.

Results
In Study 1, training led to a 9% (7% in women) increase in VO_2max and to a significant *reduction* in LPS-stimulated TNFα. In Study 2, training led to a 14% VO_2max increase but LPS-stimulated TNFa *increased* significantly. To account for this inconsistency, we used stratified-by-sex, mixed-effect models of Study 2 data on subsamples of participants, which were based on increases in VO_2max. Standardized mean log-transformed TNFα change values were computed for each subsample. In men, training elicited an increase in LPS-induced TNFα with increases in VO_2max (mean log-transformed TNFα change by VO_2max subsample respectively: 0.14, 0.24, 0.25, 0.33, 0.35, 0.66, 1.2). In women, low levels of VO_2max improvement were associated with reductions in TNFα and higher levels associated with increases in stimulated TNFα (-0.11, -0.11, -0.04, -0.02, 0.03, 0.16, 0.22).

Conclusions
In women, aerobic exercise training leads to changes in LPS-induced TNFα ranging from anti- to pro-inflammatory as improvements in VO_2max increase. Thus, in Study 1, primarily women who achieved only a small VO_2max improvement, the response to LPS was anti-inflammatory whereas in Study 2, roughly equal in men and women in whom the training-induced improvement in VO_2max was greater, the response was pro-inflammatory. Recognizing the limits of this exploratory post-hoc analysis, these two studies suggest the possibility of significant sex differences in the transduction of exercise training-induced improvements in aerobic capacity to inflammatory responses to *ex vivo* stimulation.

Abstract 1042
TOO MUCH ON YOUR PLATE: FOOD AS A STRESSOR FOR WOMEN WITH BODY IMAGE CONCERNS
Mora A. Reinka, M.S., Diane M. Quinn, Ph.D., Psychological Sciences, University of Connecticut, Storrs, CT
While there is an abundance of work on weight stigma, we know little about what cues may act as stressors to those who are concerned about their weight. The current study examines densely caloric food as one such potential stressor. Participants completed a cognitive battery with food cues as stimuli, and then were allowed to freely snack while caloric consumption was surreptitiously measured. Initial results suggest that one's (negative) body image, as measured by the discrepancy between current and ideal body silhouettes, mediates the relationship between subjective stress in response to the tasks and caloric consumption. That is: women's reported stress after the battery of food images is positively associated with their body image discrepancy, b = .008, SE = .004, p = .029, but this discrepancy predicts fewer calories consumed, b = -38.50, SE = 11.32, p = .001; bootstrapped indirect effect, b = -.321, SE = .160 [-.707, -.058] (see attached Figure). Densely caloric food may be appraised as a stressor to those who have poor body image, and caloric restriction may be one coping method used in response. Task performance, habitual eating behavior, and other individual differences were also measured.

VIEW PDF

Abstract 1597
IMPACT OF MENSTRUAL CYCLE PHASE ON FOOD CUE-ELICITED BRAIN POTENTIALS
Jana Strahler, PhD, Andrea Hermann, PhD, Rudolf Stark, PhD, Jürgen Hennig, PhD, Aisha J. Munk, PhD, Psychology and Sport Sciences, Justus Liebig University Giessen, Giessen, Germany
It is well known that the menstrual cycle impacts mood and behavior. Less explored is the cycle's impact on food cue-elicited brain potentials. Following research on premenstrual dysphoric disorder, altered processing can especially be expected during the luteal phase.
Using a within-subject design, the present study investigated late positive potential (LPP) amplitudes towards food pictures and the moderating effects of progesterone, emotional- and stress eating, negative affect, as well as premenstrual symptoms (PMS).
Thirty-five free-cycling women (aged 24.7±10.8 years, 22.3±9.5 kg/m², 27.9±2.2 days typical cycle length) were exposed to pictures of food (high and low caloric) and control items (all derived from the food.pics database) during the follicular, the ovulatory and the luteal phase (counterbalanced), while EEG was recorded. Subjective levels of food craving, negative affect and salivary progesterone were assessed at each phase.
While average LPPs for a parietal cluster (containing electrode sites P3, Pz, and P4) were comparable between cycle phases (p=0.548), slightly larger LPP amplitudes were elicited by high caloric food pictures (p=0.069). Especially during the luteal phase, both food categories elicited larger LPPs than neutral pictures (p=0.065). Analyses of LPPs for central and central-parietal regions showed similar processing of food pictures and neutral pictures, independent of cycle phase. During the luteal phase, stress eating, progesterone, PMS, and negative affect (but not wanting, liking, or body mass index) significantly predicted larger parietal LPPs towards high caloric pictures. None of the assumed moderators explained variance in LPPs towards low caloric pictures.
Overall, this study provides initial evidence for food-related information being processed differently throughout the female menstrual cycle. According to these results, such a heightened food cue-sensitivity during the luteal phase may relate to higher ovarian hormone secretion, more stress-related eating and negative affect, and fewer premenstrual symptoms (implicating a down-regulation in those with higher PMS).

Abstract 1652
SHORT SLEEP DURATION IN THE MONTH FOLLOWING ACUTE CORONARY SYNDROME IS ASSOCIATED WITH 6-MONTH HOSPITAL READMISSION RISK
Ari Shechter, PhD, Emily K. Romero, BA, Anusorn Thanataveerat, MPH, Marwah Abdalla, MD, MPH, Medicine, Columbia University Irving Medical Center, New York, NY, Carmela Alcantara, PhD, School of Social Work, Columbia University, New York, NY, Ian M. Kronish, MD, MPH, Donald Edmondson, PhD, Medicine, Columbia University Irving Medical Center, New York, NY
Background: Hospital readmission following acute coronary syndrome (ACS) is associated with worsened patient outcomes and financial burden. Short sleep duration is a risk factor for cardiovascular events, and may therefore represent a behavioral factor that increases risk of adverse post-hospitalization outcomes. Here, we examined whether short sleep duration in the month after evaluation for ACS is associated with 6-month all-cause emergency department (ED) and hospital readmission.
Method: Current participants were patients with a diagnosis of probable ACS who were enrolled in the Reactions to Acute Care and Hospitalization (REACH) study, an observational cohort study examining how environmental, psychosocial, and behavioral factors relate to adverse long-term health outcomes following ACS evaluation. Sleep duration following ACS hospitalization was assessed with the following question: "During the past month, how many hours of actual sleep did you get at night?", and was dichotomized as short (<6 hours) or not short (≥6 hours). A Cox

proportional hazards model was used to assess the association between short sleep duration during the month following ACS evaluation and 6-month all-cause ED/hospital readmission.
Results: A total of 580 participants with complete data were included in analyses. Approximately 34% of participants reported short sleep duration during the month following ACS evaluation. A greater proportion of participants with short sleep vs. not short sleep experienced an ED/hospital readmission (33.0% versus 20.6%; p=0.001). Short sleep duration was significantly associated with readmission in the unadjusted model (hazard ratio [HR]=1.67; 95% CI: 1.21–2.30), and after adjusting for age, sex, race/ethnicity, clinical severity (Charlson comorbidity index, Global Registry of Acute Coronary Events score), depression, and acute stress disorder status (HR=1.59; 95% CI: 1.13–2.24).
Conclusion: Short sleep duration following ACS evaluation is prevalent, and is associated with increased risk of all-cause readmission within 6 months of discharge. Future work should explore these associations using objective measures of sleep duration (e.g. wrist accelerometry). Current findings suggest that short sleep duration is an important contributor to readmission risk, and may be a potential modifiable behavioral target to reduce risk of post-ACS readmission.

VIEW PDF

HIV
Thursday, March 7 from 11:00 am to 12:00 pm

Abstract 1662
AFFECTIVE PROCESSING OF TRAUMA ESSAY PREDICTS SURVIVAL OVER 17 YEARS IN HIV
Gail Ironson, MD, PhD, Psychology and Psychiatry, Emily Hylton, MPH, Psychology, University of Miami, Coral Gables, FL
Background: Our group has previously shown that emotional/cognitive processing exhibited in essays written about traumatic events using subjective scoring predicted slower disease progression in people with HIV over 4 years. The purpose of this substudy was to identify which of 4 variables related to processing (but scored objectively using Pennebaker's Linguistic Inquiry and Word Count (LIWC) automated scoring) would predict survival over 17 years. The 4 variables were negative emotion, positive emotion, affect processes and cognitive processes.
Method: We recruited a diverse sample of 177 people with HIV (30% women; 36% African American) who were in the mid-range of illness (CD4 predominantly between 150 and 500, never had an AIDS defining symptom) at entry to our study, and followed them for up to 17 years. At baseline and every 6 months, questionnaires, a face to face interview on stress and coping with HIV, and blood draws were conducted. At baseline, they also wrote about the most traumatic event that happened to them (n=167). The essays were analyzed using the LIWC for these 4 variables: positive emotion, negative emotion, affective processes and cognitive processes. Our dependent variable was survival over up to 17 years.
Results and Conclusion: During this 17 year period, 35% (58/167) died. After controlling for medical variables related to survival (baseline CD4, viral load, age and antiretroviral medication) only affective processing predicted significantly lower mortality [Chi-square change(1) = 3.836, p = .05]. Dichotomizing affective processes at the median (4.61) revealed that those in the top half were roughly half as likely to have died at the 17 year mark (.561) compared to those in the bottom half. These findings suggest that and while much of our therapy focus is on cognitive processes, affective processes may be even more important.

Abstract 1549
DEPRESSION AS A POTENTIAL RISK FACTOR FOR CARDIOVASCULAR DISEASE IN PEOPLE WITH HIV: A SYSTEMATIC REVIEW
Brittanny M. Polanka, MS, Tamika C.B. Zapolski, PhD, Adam T. Hirsh, PhD, Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN, Samir K. Gupta, MD, Infectious Disease, Indiana University School of Medicine, Indianapolis, IN, Matthew S. Freiberg, MD, Cardiovascular Medicine, Vanderbilt University School of Medicine, Nashville, TN, Kaku A. So-Armah, PhD, General Internal Medicine,, Boston University School of Medicine, Boston, MA
Objective: People living with HIV (PLWH) are disproportionately affected by cardiovascular disease (CVD). Pathologic mechanisms of CVD in PLWH are not normalized by antiretroviral therapy, and the increased CVD risk is not accounted for by traditional or HIV-specific CVD risk factors. There is a need to identify novel risk factors of CVD in PLWH. One candidate is depression as it independently predicts CVD and its pathological mechanisms. The primary objectives of our review were to (1) synthesize results of studies examining associations between depression and CVD-related outcomes and (2) propose a conceptual model of depression's potential role in CVD risk in PLWH.
Methods: A systematic literature search of PubMed, PsycINFO, EMBASE, Web of Science, and CINAHL was performed for published, English studies examining the association between depression and a CVD-related outcome in an HIV sample between the earliest date and April 28, 2018. Eligible outcomes were pre-specified markers of clinical CVD, subclinical CVD, and pathological mechanisms (immune activation, systemic inflammation, and altered coagulation).
Results: 20 articles met inclusion criteria (clinical CVD, *n*=6; subclinical CVD, *n*=1; immune activation, *n*=9; systemic inflammation, *n*=7; altered coagulation, *n*=1). Studies were largely cross-sectional (70%) and assessed depression via questionnaire (75%), medical record diagnosis (15%), and clinical interview (10%). For clinical CVD, findings consistently indicated that depression was independently associated with an increased risk of future CVD (*HR*s:1.30-2.35). For subclinical CVD, one study was found, which reported no associations between depression and carotid intima media thickness or carotid plaque. For immune activation and systemic inflammation, findings were mixed but exhibited preliminary evidence of a positive association between depression and both mechanisms. For altered coagulation, one study was found, which reported lower platelet counts among adults with depression.
Conclusions: Depression is likely an independent risk factor for CVD in PLWH. There is a need for research examining the associations of depression with subclinical CVD and the mechanisms of CVD in PLWH. The review findings raise the possibility that depression may be a novel risk factor of CVD in PLWH and that its treatment may serve as a potential CVD prevention strategy.

Abstract 1625
VIRAL LOAD SUPPRESSION, MENTAL HEALTH, AND QUALITY OF LIFE AMONG PEOPLE LIVING WITH HIV IN SOUTH CAROLINA
Hyunsan Cho, Ph. D, Yanping Jiang, MA, Xiaoming Li, Ph. D, Health Prom., Educ. & Behavior, University of South Carolina, Columbia, SC
Background: Due to highly active antiretroviral therapy, research have directed towards secondary HIV prevention with people living with HIV (PLWH). The relationship between viral load and mental health outcomes among PLWH has been established, but only a limited number of studies has examined the associations between viral load suppression and quality of life among PLWH. This study aims to examine the relationships between viral load suppression, mental health outcomes, and WHOQOL (WHO Quality of Life) among PLWH in South Carolina (SC).

Methods: The cross-sectional health behavior assessment survey was conducted among 402 PLWH in SC. HIV positive patients were recruited for May-September in 2018, at one health clinic in Columbia, SC. We examined the associations of viral load suppression, depression, anxiety, and four domains of WHOQOL. Bivariate and multivariate analyses were conducted to predict WHOQOL.
Results: Data showed that 71% of PLWH reported an undetected viral load, and 33% rated their QOL as 'very good'. T-tests showed that those who reported to have detected viral load experienced significantly higher depression, anxiety, and lower quality of life in four domains of WHOQOL (physical health, psychological health, environmental health, and social relations). In Multivariate analyses, self-awareness of undetected viral load was significantly associated with depression ($p<0.001$), anxiety ($p<.001$), physical health ($p=0.05$), psychological health ($p=0.001$), and environmental health ($p=0.01$), but not with social relations ($p=0.21$) controlling for covariates such as age, gender, race, and sexual orientation.
Conclusions: This finding suggests that self-awareness of detected vs. undetected viral load has significant impact on overall qualities of life and mental health among PLWH in SC. Since poor QOL predicts non-adherence to antiretroviral therapy, monitoring self-perceived QOL can be a useful tool to assess the effect of treatment and behavioral changes over time among PLWH.

Abstract 1712

ALEXITHYMIA AND CARDIAC INTEROCEPTIVE AWARENESS IN WOMEN LIVING WITH HIV

Roger McIntosh, Ph.D., Judith Lobo, M.S., Jennifer Britton, Ph.D., Psychology, Universiy of Miami, Coral Gables, FL

Chronic infection with HIV is associated with greater total mood disturbance. We have previously demonstrated that greater levels of alexithymia and specifically difficulty identifying and describing feelings (DIDF) relate to greater mood disturbance and disease severity. Using a cardiac interoceptive awareness task we compared the Blood-oxygen level dependent (BOLD) signal during a heartbeat detection task between 12 HIV+ postmenopausal women and 13 HIV- controls. HIV+ women showed a trend toward greater DIDF on the Toronto Alexithymia Scale (TAS-26) ($p < .10$). Brain activation recorded during the heartbeat detection task (while ignoring distracting tones) was significantly higher for postmenopausal women in the left anterior insula, thalamus, and somatosensory cortex, compared to HIV- controls (FWE-corrected, $p < .05$). Upon regressing DIDF scores on BOLD signal during the heartbeat detection task higher activity in the right amygdala and left medial frontal gyrus was associated with greater DIDF whereas greater activity in the left insula and anterior cingulate cortex was associated with less self-reported DIDF (FWE-uncorrected, $p <.001$). These preliminary findings support higher levels of alexithymia and distress (particularly bewilderment) in women living with HIV. Although ongoing, our study suggests cardiac interoception may be more effortful for HIV+ women compared to HIV- controls as evinced by greater recruitment of somatosensory and interoceptive brain regions. Furthermore, greater recruitment of these salience/interoceptive regions relates to lower self-reported DIDF whereas higher limbic activation relates to greater DIDF.

Inflammation

Friday, March 8 from 11:30 am to 12:30 pm

Abstract 1750

THE MECHANISTIC ROLE OF INFLAMMATION ON THE ASSOCIATION BETWEEN CARDIAC VAGAL ACTIVITY AND THE LIPID ACCUMULATION PRODUCT

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Body mass index (BMI) serves as only a modest predictor of cardiovascular disease (CVD). In contrast, the lipid accumulation product (LAP), calculated using both waist circumference (WC) and triglyceride (TG) fasting concentration, better predicts CVD risk compared to BMI. Interestingly, lower vagally mediated heart rate variability (vmHRV), an index of cardiovascular and overall health, is associated with both higher BMI and greater CVD risk. Yet, research has not shown a relationship between vmHRV and LAP. Furthermore, obesity is considered to be an inflammatory disease and thus, inflammation should mediate the association between vmHRV and LAP. The following investigation sought to examine the direct association between 24hr vmHRV and LAP, in addition to how inflammation may serve as a mechanism underlying this association. In a sample of 641 individuals (70 females, mean age of 42 years, standard deviation of 12 years), continuous heart rate data was recorded for a full typical work day. The root mean square of successive differences was used as the measure of vmHRV for the full day (total vmHRV). Adiposity measures include BMI, WC, TG, and LAP. LAP was calculated as: LAP (men) = (WC [cm] - (65) × (TG concentration [mmol/L]); LAP (women) = (WC [cm] - 58) × (TG concentration [mmol/L]). Urinary c-reactive protein (mg/l) was used as our index of inflammation. Zero-order correlations results showed total vmHRV to be significantly negatively associated with all adiposity measures (each $p < .05$). Controlling for age and sex, results showed a significant negative association between total vmHRV and both TG concentration ($r_{partial} = -.099$, $p = .022$) and LAP ($r_{partial} = -.134$, $p = .002$). CRP partially mediated the association between vmHRV and both TG concentration (B = -0.03 (0.02), Boot 95% CI: [-0.071, -0.004], $p < .05$) and LAP (B = -0.13 (0.03), Boot 95% CI: [-0.203, -0.061], $p < .05$). These data are the first to show an association between vmHRV and LAP and suggest a stronger association than that of vmHRV and BMI – results in line with CVD research. As LAP is comprised of two components of metabolic syndrome, vmHRV appears more consistently associated with TG concentration compared to WC. Overall, lower vmHRV may lead to increased CRP, and subsequently increased LAP, primarily via increased TG concentration. Additional models and implications will be discussed.

Abstract 1772

AN INFLAMMATORY PATHWAY LINKS RETROSPECTIVE RECALL OF CHILDHOOD PHYSICAL ABUSE WITH RESTING CORTICOLIMBIC CONNECTIVITY IN MIDLIFE ADULTS

Thomas E. Kraynak, MS, Anna L. Marsland, PhD, Jamie L. Hanson, PhD, Peter J. Gianaros, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Exposure to physical abuse in childhood confers risk for negative mental and physical health outcomes across the life course, possibly by affecting corticolimbic brain circuits implicated in threat processing, emotion regulation, and peripheral physiological regulation. Critically, the biological pathways that link childhood abuse to this risk in adulthood are not fully understood. The present study considers the role of systemic inflammation, which is often elevated in adults reporting childhood physical abuse, and moreover modulates functioning within corticolimbic circuits comprising the amygdala, hippocampus, and prefrontal cortex (PFC). In accordance with prior theoretical accounts, it was hypothesized that systemic inflammation would account for associations between physical abuse in childhood with corticolimbic connectivity in adulthood. Midlife community volunteers (N = 303; 30-51 years of age; 149 women) without psychiatric diagnoses or cardiovascular or immune diseases provided retrospective reports of childhood physical abuse. Corticolimbic connectivity was measured using resting state functional magnetic resonance imaging. Circulating levels of interleukin(IL)-6, an inflammatory cytokine linked to childhood abuse and corticolimbic functionality, were measured via fasting blood draw. Consistent with prior research, retrospectively reported childhood physical abuse associated positively with circulating IL-6, and negatively with resting functional connectivity between the amygdala and ventromedial PFC (vmPFC). IL-6 associated negatively with several corticolimbic connections including the amygdala and vmPFC. Moreover, in a mediation model adjusting for relevant covariates, IL-6 statistically mediated the association of childhood physical abuse with adult amygdala-vmPFC connectivity. In conclusion, experiences of physical abuse during childhood may relate to alterations in threat and emotion regulation brain circuitry in adulthood via peripheral inflammatory pathways. As such, peripheral inflammatory pathways may comprise a modifiable target for predicting, preventing, and treating potential negative mental and physical health consequences of childhood abuse.

Abstract 1033

PSYCHOSOCIAL CORRELATES OF INFLAMMATION IN ETHNIC AND RACIAL MINORITIES: A SYSTEMATIC REVIEW

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Background: Ethnic and racial minorities are at increased risk of development and progression of medical conditions linked to inflammation, including cancer and cardiovascular disease. Existing literature suggests bidirectional pathways linking inflammation to stress, depression, and social support that can be targeted by interventions to reduce inflammation and improve health. However, little research has tested whether these biopsychosocial correlates of inflammation hold in samples comprised of ethnic and racial minorities, who differ from non-Hispanic Whites in their levels of inflammation and psychosocial experiences. A systematic review was conducted to characterize the literature on psychosocial correlates of inflammation in ethnic and racial minorities. **Methods**: MEDLINE (PubMed), Embase (Elsevier), Cochrane Central Register of Controlled Trials (Cochrane Library), Web of Science (Clarivate Analytics), CINAHL (EBSCO) and PsycINFO (Ovid) were searched using a combination of controlled vocabulary and free-text terms with truncation. Primary peer-reviewed research papers written in English and published through July 2018 were included if they reported relationships between inflammation and a psychosocial variable related to stress, depression, or social support in a non-White sample. Seven coders reviewed titles, abstracts, and full-texts. Of 4745 identified papers, 49 articles were eligible. The Downs and Black Checklist is being used for quality assessment. **Results**: Outcomes include demographic and medical variables, psychosocial and inflammatory biomarker measures, study design characteristics, hypotheses and results, and study limitations. **Conclusions**: This is the first review to identify psychosocial correlates of inflammation in non-White groups. Countering the assumption that biopsychosocial mechanisms are the same across racial and ethnic subgroups prevents obscuring potentially important differences that could necessitate more tailored interventions to reduce inflammation. As behavioral interventions to decrease inflammation are increasingly disseminated and implemented, it is increasingly important to prevent health disparities by revealing biopsychosocial pathways unique to ethnic and racial minorities to decrease inflammation and improve health.
Note: Data collection is in progress and will be completed and analyzed no later than 3/6.

Abstract 1373

POSITIVE ASSOCIATION OF PRO-INFLAMMATORY PROCESSES WITH PSYCHOSOCIAL WELL-BEING IN HIGHLY FUNCTIONAL NONAGENARIANS

Nicolas Rohleder, PhD, Institute of Psychology, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany, Roland Rupprecht, PhD, Frieder R. Lang, PhD, Institute of Psychogerontology, Friedrich-Alexander-Universität Erlangen-Nürnberg, Nürnberg, Germany

Objective: Aging is typically accompanied by increasing inflammatory activity. It is assumed, based mainly on data of older adults younger than ninety years, that higher increases in inflammation are related with faster declines in functional health and psychosocial well-being. We set out here to extend these results to high-functioning Nonagerians, to better understand factors contributing to longevity.
Methods: N=125 participants between 90 and 100 years (mean=91.85; 53.2% female) who were sufficiently mobile for a laboratory visit were enrolled. N=105 provided blood samples for measurement of interleukin (IL)-6 and IL-10, and were interviewed to gather data on psychosocial well-being and functional health.
Results: Interleukin-6 ranged from 0.66 to 4.79 pg/ml (mean=2.29), IL-10 ranged from 0.09 to 5.40 pg/ml (mean=1.09). IL-6, but not IL-10 was correlated with age ($r=0.37$; $p<0.001$). IL-6, as well as IL-6/IL-10 ratio, were inversely related with self-rated depressive symptoms (beta=-.26; p=0.016; beta=-.24; p=0.038). Self-reported quality of close relationships, self-efficacy, and valuing of longevity were positively related with IL-6, and IL-6/IL-10 ratio (all beta's > 0.21; all p's < 0.05).
Conclusions: In contrast to our hypotheses, we found positive relationships of inflammation with psychosocial well-being and functional health, and inverse relationships with depressive symptoms. It appears that in this group, associations of inflammation with psychosocial and functional health are reversed compared to other groups of older adults. While highly speculative, these reversed relationships might be interpreted as inflammation serving protective functions in highly mobile very old adults.

Late Breaking Clinical Trials 1: Changing Depression, Mood and Stress for Better Health
Thursday, March 7 from 9:30 to 10:45 am

Abstract 1809
BLENDED COLLABORATIVE CARE FOR TREATING SYSTOLIC HEART FAILURE AND COMORBID DEPRESSION: 12-MONTH PRIMARY OUTCOMES FROM THE HOPEFUL HEART TRIAL
Bruce L. Rollman, MD, MPH, Amy Anderson, MS, Kaleab Z. Abebe, PhD, Kwonho Jeong, MS, Bea Herbeck Belnap, Dr. Biol. Hum., Ravi N. Ramani, MD, Matthew F. Muldoon, MD, Medicine, Jordan F. Karp, MD, Psychiatry, University of Pittsburgh, Pittsburgh, PA
Background: Heart failure (HF) affects 6.6 million Americans with over 650,000 newly diagnosed cases and 330,000 deaths annually. Yet despite improvements in care, HF mortality is essentially unchanged in recent years. One potential reason is depression. It is co-morbid in nearly 40% of hospitalized HF patients and linked to reduced health-related quality of life (HRQoL) and increased mortality, but often goes untreated. The NHLBI-funded Hopeful Heart Trial is the first study to evaluate the impact of a collaborative care program for treating depression in patients with HF.
Methods: From 3/14 to 10/17, we screened inpatients with systolic HF (ejection fraction (EF) ≤45%) and NYHA class II-IV symptoms for depression using the Patient Health Questionnaire (PHQ-2) at 8 Pittsburgh hospitals. Two weeks post-discharge, we telephoned screen-positive patients (PHQ-2 (+)) to administer the PHQ-9 and randomized those who scored ≥10 to either their PCP´s "usual care" (UC) or to one of two nurse-delivered 12-month collaborative care programs for treating: (1) depression and HF ("blended"); or (2) HF alone (attention control (AC)). Study nurses met weekly with clinician-investigators for case review and then provided treatment advice to patients and their PCPs. To facilitate comparisons, we also randomly selected a cohort of non-depressed HF patients (PHQ-2(-)/PHQ-9 <5). At baseline, we collected sociodemographic and clinical data, and then monitored outcomes through periodic blinded telephone assessments.
Results: Of the 756 HF patients (629 depressed; 127 non-depressed; mean age: 64, 56% male, 73% White, mean EF 28%), those depressed had worse mental HRQoL (SF-12 MCS, mean: 40.1 vs. 60.5), physical function (KCCQ-12: 40.4 vs. 76.8), and mood (HRS-D: 16.8 vs. 2.0) than those non-depressed (all P<0.001), but were otherwise similar medically. At 12-months follow-up, "blended" care patients reported a 0.35 ES improvement on the SF-12 MCS, our primary outcome measure vs. UC (95% CI: 0.13-0.57; P=0.002), but scored similarly as those randomized to our AC (0.09 ES; P=0.33).
Conclusions: "Blended" collaborative care for treating both depression and HF improves HRQoL more than physicians' UC at 12-months following hospitalization. Analyses are ongoing and we will present data on the impact of our interventions on health services utilization, mortality, and other outcomes.

Abstract 1433
RANDOMIZED CONTROLLED TRIAL OF TAI CHI AMONG OLDER ADULTS WITH HYPERTENSION: EFFECTS ON DEPRESSIVE SYMPTOMATOLOGY, INTEROCEPTIVE AWARENESS, AND CARDIOVASCULAR RESPONSES TO BRIEF EXERCISE.
Kathleen L. Wilson, MS, Jordan Kohn, PhD, Meredith A. Pung, PhD, Family Medicine and Public Health, Milos Milic, MD PHD, Psychiatry, Nicholas Guay-Ross, BS, Chris Pruitt, BS, Amanda Wilson, MS, Chad Spoon, MS, Family Medicine and Public Health, Gary Lyasch, BS, Psychiatry, University of California San Diego, La Jolla, CA, Laura Redwine, PhD, College of Nursing, University of South Florida, Tampa, FL, Suzi Hong, PhD, Family Medicine and Public Health, University of California San Diego, La Jolla, CA
Objective: We sought to examine intervention effects of Tai Chi (TC) vs Health Education (HE) on several psychological measures (depressive symptoms, interoceptive awareness, and mindfulness) and physiological responses to an exercise test (heart rate variability HRV, blood pressure BP, and heart rate HR) among older adults with hypertension.**Methods:**Hypertensive older adults (N=121; age=72.8±8.4 yrs; systolic BP=133±18 mmHg) were cluster-randomized to 12 weeks of group TC (N=65) or HE (N=56) classes. Baseline (T1) and post-intervention (T2) assessments included: depressive symptomatology (Beck Depression Inventory BDI-II), awareness of internal body state (Multidimensional Assessment of Interoceptive Awareness MAIA), dispositional mindfulness (Mindfulness Attention Awareness Scale MAAS). Patients performed a cycle ergometer exercise protocol during lab visits at T1 and T2 during which HR, BP, and HRV were continuously recorded and averaged over each of five epochs: supine; seated pre-exercise (; steady-state A; steady-state B; post-exercise recovery. Physiological responses were modeled across all five epochs with separate linear mixed-effects models, with BDI, MAIA, MAAS scores, intervention group, lab visit, and their interaction. Age and waist circumference were included as covariates.**Results:** MAIA scores increased at T2 across all patients (b_{visit}=3.06, t=2.04, p=.046). Increases were larger in the TC group (T1=97.2 ± 3.1; T2=108.2 ± 4.1) vs. HE (T1=96.9 ± 2.9; T2=101.3 ± 2.8), but did not reach statistical significance. BDI scores decreased by 33% in the TC group (T1=8.2 ± 1.0; T2=5.5 ± 1.2), but not the HE group ($b_{group*visit}$=-1.48, t=2.29, p=.024). There were no group or treatment effects on MAAS scores. Diastolic BP across the testing protocol was significantly lower in the TC group at T2 vs. HE ($b_{group*visit}$=-9.16, t=-3.37, p<.001). There were no group or treatment effects on SBP; however, higher MAIA scores were associated with higher SBP (b_{MAIA}=0.34, t=3.20, p=0.002). HR was lower at T2 across both groups (b=-3.62, t=-3.35, p<0.001). In the TC group, HRV tended to be higher at T2, but was unchanged between visits in the HE group (RMSSD: $b_{group*visit}$=9.56, t=1.79, p=.08).**Conclusions:** TC practice may have positive effects on depressive symptomatology, interoceptive awareness and nervous system regulation in older adults with hypertension.

Abstract 1490
A RANDOMIZED TRIAL OF A POSITIVE PSYCHOLOGY-BASED INTERVENTION TO PROMOTE PHYSICAL ACTIVITY AFTER AN ACUTE CORONARY SYNDROME: THE PEACE-IV TRIAL
Jeff C. Huffman, MD, Christopher M. Celano, MD, Melanie Freedman, BA, Rachel A. Millstein, PhD, Emily Feig, PhD, Psychiatry, Nasrien Ibrahim, MD, Cardiology, Massachusetts General Hospital, Boston, MA
Background: Physical activity after an acute coronary syndrome (ACS) is independently associated with superior recovery and lower rates of mortality, but the majority of post-ACS patients are not able to reach recommended levels of physical activity. Motivational interviewing (MI) interventions have had some effects on improving health behaviors in cardiac-related populations, but patients with lower optimism, positive affect, and self-efficacy may not engage optimally in MI-based programs.
Methods: We completed a randomized trial of a 12-week combined positive psychology-motivational interviewing (PP-MI) intervention, compared to MI alone, in 46 post-ACS patients. The PP-MI intervention was delivered by phone, with participants completing both PP activities and MI-based content independently during the week that were then reviewed and discussed with a study trainer. Participants in the MI condition received a similar treatment manual and calls, though with no PP content. Participants completed measures of psychological status, functional status, and health behaviors (including both self-reported and accelerometer-based physical activity assessments) at baseline, 12 weeks, and 24 weeks. The primary study outcome measure is feasibility (as measured by number of sessions completed, along with participant ratings of

intervention utility). Secondary outcomes include physical activity (main secondary outcome), with additional outcomes including positive and negative psychological constructs, function, overall adherence to cardiac health behaviors, and clinical outcomes (e.g., readmissions). For secondary analyses, the groups will be compared using random effects models, and given the size of the trial and the rigorous control condition, we do not expect significant ($p<.05$) between-group differences and will also examine effect size differences (Cohen's d) in change from baseline between groups.
Results: Follow-up assessments will be complete in November 2018, and all data will be analyzed before March 6, 2019.
Conclusions: This trial will examine the feasibility and acceptability of the PP-MI intervention, and explore between-group differences in physical activity, in post-ACS patients. If it appears to be feasible and to have promising effects on clinical outcomes, we will next examine the intervention in a larger, well-powered trial.

Abstract 1784

BRIEF MINDFULNESS-BASED STRESS MANAGEMENT PROGRAM FOR A BETTER MENTAL STATE IN WORKING POPULATIONS - HAPPY NURSE PROJECT: A RANDOMIZED CONTROLLED TRIALS

Norio Watanabe, MD, PhD, Health Promotion and Human Behavior, Kyoto University, Kyoto, Japan

Background
Mindfulness-based psychotherapy is shown to be efficacious for health problems, and, in clinical studies, usually conducted by trained instructors, who are not always accessible in real world. In addition, the efficacy of the mindfulness-based stress management program for maintaining a better mental state has not been examined among working populations. We aimed to explore the effectiveness of the brief mindfulness-based stress management program for hospital nurses.
Methods
Eighty junior nurses working in hospitals were randomly allocated either to the brief mindfulness-based stress management program or psychoeducation using a leaflet. The program consisted of four 30-minute individual sessions conducted by senior nurses receiving a 1-day training workshop using a detailed manual.
The primary outcome was the total score of the Hospital Anxiety and Depression Scale (HADS) at week 26. Secondary outcomes included presence of a major depressive episode; severity of depression, anxiety, insomnia, burnout, and presenteeism; utility scores; and adverse events up to 52 weeks.
Results
The mean HADS score of all the participants at baseline was 7.2. At 26 weeks, adjusted mean scores on the HADS score were 7.2 (95% confidence intervals: 5.9, 8. 5) in the program group and 6.0 (4.8, 7.2) in the leaflet group, respectively. The coefficient of the group by time interaction was not statistically significant at -1.41 (-3.35, 0.54; P=0.156). No significant superiority or inferiority was observed on the other outcomes.
Conclusion
The additive value of the brief mindfulness-based stress management program was not confirmed in terms of mental state and work efficiency.

Late Breaking Clinical Trials 2: Cancer Research
Saturday, March 9 from 12:15 to 1:30 pm

Abstract 1039

THE SEAMLESS STUDY: A CLINICAL TRIAL EVALUATION OF A SMARTPHONE APP-BASED MINDFULNESS INTERVENTION FOR CANCER SURVIVORS

Utkarsh Subnis, PhD, Linda Carlson, PhD, Oncology, University of Calgary, Calgary, AB, Canada

Background: The Mindfulness-Based Cancer Recovery (MBCR) program, is an evidence-based group cognitive-behavioral therapy that has been shown effective for symptom-management in cancer survivors. However, MBCR is traditionally a face-to-face program which many cancer patients are unable to attend for reasons such as compromised immunity, side-effects and scheduling conflicts and travel problems. Additionally, MBCR programs are expensive as they need trained instructors and a dedicated space.
Methods: Our team has developed a low-cost version of the MBCR program that can significantly extend reach by technologically adapting it for delivery through a smartphone mobile-application or app. However, the app-version of MBCR needs rigorous evaluation in the cancer population. The current study has received ethics approval and is in the process of assessing the effectiveness of a 4-week app-based MBCR program for cancer survivors recently completed curative treatments. The study is a two-arm randomized controlled trial which compares the app-based MBCR group to a waitlist usual care control group on self-reported symptoms of stress (primary outcome), fear of cancer recurrence, fatigue, anxiety, depression, physical function and return to work (secondary outcomes) at 6 time points: baseline, mid-point of intervention, immediately post intervention, 3, 6 and 12 months' follow-up; we will also be analyzing biometric data obtained by the mobile-app.
Results: The sample size for this study has been estimated at N=78, using an effect size of d=0.5 reported in the literature, for a Multiple Analysis of Variance (MANOVA) and linear mixed model (LMM) analyses, and includes oversampling for 20% anticipated attrition. Study participants will include cancer survivors of all cancer sites who are at least 2 weeks' post-treatment completion and willing to participate in 20-30 minutes of app-based mindfulness practice, and answer surveys before and after. We expect to find that the app-based MBCR will lower symptoms of stress in comparison to the wait list control group at 3 months' post-baseline.
Discussion: If effective this type of low-cost app-based intervention could be easily translated into a tool used to reach a large number of patients and survivors no matter where they reside, including those in remote locations, helping them transition back to post-treatment life.

Abstract 1447

PARTICIPANT RETENTION AND ADHERENCE IN BEHAVIORAL TRIALS: EARLY RESULTS FROM AN ONGOING PREFERENCE-BASED COMPARATIVE EFFECTIVENESS TRIAL OF MINDFULNESS BASED CANCER RECOVERY VS. TAICHI/QIGONG FOR CANCER SURVIVORS (THE MATCH STUDY)

Devesh V. Oberoi, PhD, Katherine-Ann Piedlue, BA student, Oncology, University of Calgary, Calgary, AB, Canada, Steven Guirgis, MA, Health, Wellness & Cancer Survivorship Centre, Princess Margaret Cancer Centre, Toronto, AB, Canada, Hassan Pirbhai, B.Com, Oncology, University of Calgary, Calgary, AB, Canada, Daniel Santa Mina, PhD, kineseology, Jennifer M. Jones, PhD, Public Health, University of Toronto, Toronto, ON, Canada, Linda E. Carlson, PhD, Oncology, University of Calgary, Calgary, AB, Canada

Background: Participant retention and adherence are critical to the success of behavioral trials. Identifying and addressing problems once well into recruitment can potentially result in failure to meet sample size targets. In our ongoing study, we sought to identify

factors associated with retention and adherence related to study design features as well as participants' psychosocial characteristics. This is a multi-site comparative-effectiveness trial of mindfulness based cancer recovery (MBCR) and Taichi/Qigong (TCQ) with each other and waitlist control (WG). Participants are allowed to choose the intervention they prefer (pref), or be randomized to either. Additionally, all were randomized into completing the program immediately (IG) or were waitlisted (WG) for 4 months.

Methods: A mixed-method analysis of study non-compliance. Participants lost to follow up were those who consented to the study but did not attend any of the classes. Attendance and homework practice logs from those who did attend at least one session were used to collect data on patient adherence. Low adherence was defined as < 50% of attendance and homework each. Logistic regression was used for data analysis. Data was analyzed for 302 participants across both study sites. Participants lost to follow up were also phone-interviewed.

Results: The rates of loss to follow up, low attendance and low homework were 19%, 23% and 45% respectively. Compared to the IG group, participants in the WG group were 2.5 times more likely for loss to follow up (OR 2.56, $p<0.05$). Compared to WG, participants in the IG were 3 times more likely to have higher attendance (OR 2.93, $p<0.05$) and over 2 times more likely for higher homework log completion (OR 2.22, $p<0.05$). Choice (Pref. vs randomized) and Program type (MBCR vs TCQ) were not associated with adherence. However, those in the pref. group were over 2.5 times more likely to complete HW logs (OR 2.66, $p<0.05$) than randomized group. Qualitative reasons for loss to follow-up: cancer recurrence, travel plans,jobs, caregiving roles, and randomization to the waitlist group.

Conclusions: More flexibility in delivering the intervention (online modules) and allowing participants to choose between IG and WG groups, in addition to the preference for type of intervention, could improve retention and adherence in behavioural trials.

Abstract 1589

DEVELOPMENT AND PILOT TEST OF A BRIEF BEHAVIORAL INTERVENTION FOR DISTRESSED PATIENTS UNDERGOING SURGERY FOR GASTROINTESTINAL CANCER

Chelsea G. Ratcliff, PhD, Emily A. Tullos, BS, Psychology, Sam Houston State University, Huntsville, TX, Frances Deavers, PhD, Mental Health Care Line, Michael E. DeBakey VA Medical Center, Houston, TX, Maxwell R. Christensen, MA, Mia M. Ricardo, MA, Psychology, Sam Houston State University, Huntsville, TX, Lilian Dindo, PhD, Jeffrey A. Cully, PhD, Psychiatry & Behavioral Sciences, Baylor College of Medicine, Houston, TX

Background: Preoperative distress increases patients' risk of experiencing poor postoperative outcomes. Preoperative behavioral interventions targeting emotional and physical health can improve postoperative outcomes, but stronger effectiveness data and linkage to clinic practice are needed.

Method: Development of this 4-session telephone intervention followed an iterative decision-making process involving key stakeholders. First, a Process Evaluation (PE) was conducted with 10 patients who had recently undergone surgery for gastrointestinal (GI) cancer to assess interest in a behavioral intervention. Next, surgical and behavioral medicine providers, a patient Community Advisory Board, and intervention development experts were consulted. Then, an open pilot trial of the intervention was conducted at 1 VA and 1 private hospital. Patients with elevated distress (Distress Thermometer $\geq$4) were recruited. Depression, anxiety, and quality of life (QOL) were assessed at baseline and 1 mo after surgery; satisfaction ratings and qualitative interviews were conducted 1 mo after surgery.

Results: 70% of participants in the PE reported that increased supportive care before and after surgery would be "helpful" or "very helpful."Stakeholder feedback regarding timing and content shaped intervention design. Of the 31 patients scheduled for GI cancer surgery approached, 4 declined screening. Of the 27 screened patients, 18 (67%) reported elevated distress; of the 18 eligible patients, 17 (94%) consented; of the 17 consented patients, 10 (59%) completed the intervention and 1 month follow up. Depression, anxiety, and QOL declined from baseline to post-surgery (p's < 0.05). Satisfaction with the intervention was high (80% "satisfied" or "very satisfied"). Qualitative interviews suggested the intervention improved satisfaction with the overall healthcare team and helped with acute anxiety. Participants wanted additional help in postoperative pain management, care coordination, and subsequent treatments (e.g., chemotherapy).

Conclusion: Many patients undergoing surgery for GI cancer often experience distress and are interested in participating in a telephone-based behavioral intervention before and after surgery. Such an intervention is feasible, and can be further improved based on patient feedback. Preliminary outcomes suggest a positive impact on depression and anxiety.

Abstract 1811

THE EFFECTS OF A COGNITIVE BEHAVIORAL INTERVENTION ON WORRY ABOUT CANCER PROGRESSION AMONG WOMEN WITH GYNECOLOGIC MALIGNANCIES

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Introduction: Worry about cancer progression, also known as fear of cancer recurrence (FCR) is one of the largest reported unmet needs of oncology patients, with moderate/high FCR affecting 17-85%. FCR is typically highest at diagnosis with a sharp decline two months post-diagnosis; then remaining stable and persistent. Despite the high prevalence of FCR and perceived burden on patients, research on interventions targeting FCR is limited.

Objectives: To explore the effects of a 6-week individual Cognitive Behavioral Therapy intervention for insomnia and pain (CBTi.p.) on FCR in women with gynecologic cancer. This was an exploratory aim.

Methods: 115 women with suspected gynecologic cancer and a positive screen for sleep difficulties were enrolled prior to surgery (T0) and underwent psychosocial assessment, including a 1-item measure of FCR ("I worry that my condition will get worse") from the Functional Assessment of Cancer Therapy-Emotional Well-Being Subscale. 56 of the 115 women had confirmed cancer and underwent repeat FCR assessment, as well as polysomnography and sleep diary assessment 6-8 weeks post-surgery (T1). 35 of these participants (*M*age=59.11yrs,*SD*=11.47) had confirmed insomnia and absence of sleep apnea and were randomized to CBTi.p. (*N*=18) or Psychoeducation (*N*=17). Repeat FCR assessments occurred at post-intervention (T2), 6-8 week follow-up (T3), and 1-year follow-up (T4). Mixed linear models examined CBTi.p. effects on FCR controlling for age and stage. Intent-to-treat analyses were performed on the sample of 35 women.

Results: There were significant fixed effects of Linear Time (b=-.011; p=.003) and Quadratic Time (Time^2) (b=.0003; p=.011) on FCR (η^2=.101). There were no significant fixed effects of Condition (b=.170; p=.387; η^2=.299), Condition X Time (b=.005, p=.473), or Condition X Time^2(b=-.0002, p=.326).

Conclusions: Preliminary results suggest that among gynecologic cancer patients undergoing CBTi.p. or Psychoeducation, FCR decreased from T0 to T3 and tapered off/increased slightly at T4. Compared to the common trajectory of FCR as heightened at diagnosis with declines at 8 weeks and stabilization, our sample

showed continued FCR reductions through 21 weeks post-diagnosis, suggesting possible protective effects of CBTi.p. and Psychoeducation on FCR. Analyses may have been underpowered to detect Condition and Condition X Time effects.

VIEW PDF

Abstract 1822

KINDNESS TO OTHERS OR TO ONESELF: AN ONLINE PILOT RANDOMIZED CONTROLLED TRIAL TO ENHANCE WELL-BEING IN BREAST CANCER SURVIVORS

Marcie D. Haydon, M.A., Psychology, University of California, Los Angeles, Los Angeles, CA, Lisa C. Walsh, M.A., Megan M. Fritz, M.A., Sonja Lyubomirsky, Ph.D., Psychology, University of California, Riverside, Riverside, CA, Julienne E. Bower, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA

Developing targeted interventions to enhance well-being in breast cancer survivors is critically important given the growing number of survivors. Interest in online-based interventions is growing, as existing interventions often require in-person attendance and are time intensive. In the current study, we sought to determine the feasibility and preliminary efficacy of two interventions—acts of kindness and self-compassion meditation—with early-stage breast cancer survivors using an online platform. Performing kind acts for others has been shown to promote positive outcomes and emerging evidence suggests that self-directed kindness may also produce beneficial—albeit shorter-term—effects; indeed, recent research with breast cancer survivors highlights the role of self-compassion as an important emotion-regulation strategy. No study, to date, has compared the effectiveness of these interventions in cancer survivors. To this end, 133 early-stage breast cancer survivors (M_{age} = 62.65, range: 36-75) were randomized to one of four conditions: performing (1) acts of kindness for others, (2) acts of kindness for self, (3) self-compassion meditation, or (4) a daily-activities-writing control. Activities were performed three times each week for 4 weeks, and participants completed online assessments before, during, and after the intervention. The primary outcomes were psychological well-being and depressive symptoms, and secondary outcomes included positive and negative affect, social connection, self-kindness, and physical health symptoms (i.e., fatigue, sleep, and pain). Consistent with previous research, we hypothesized that women who performed both kind acts towards others (e.g., writing a note to a coworker) and self-compassion meditation would show improvements in well-being and reductions in depressive symptoms from baseline to post-intervention when compared to the control condition. Data collection for this study was recently completed, and analyses are underway. Thus far, results highlight the feasibility of conducting online interventions with breast cancer survivors. Ultimately, we hope to enhance understanding of the effects of self- versus other-focused kindness in this patient population and contribute to the aim of identifying effective, easy-to-disseminate interventions to promote well-being and resilience among cancer survivors.

Late Breaking Research in Culture, & Discrimination

Friday, March 8 from 1:30 to 2:45 pm

Abstract 1801

DAY-TO-DAY FLUCTUATIONS IN EXPERIENCES OF DISCRIMINATION: ASSOCIATIONS WITH SLEEP AND THE MODERATING ROLE OF INTERNALIZED RACISM AMONG AFRICAN AMERICAN COLLEGE STUDENTS

Thomas E. Fuller-Rowell, PhD, College of Human Sciences, Auburn University, Auburn, AL

Studies of perceived discrimination and sleep have largely focused on between-person differences in discrimination as correlates of sleep outcomes. These studies are limited in that third variables such as negative affect or racial identity may be acting as confounders or otherwise influencing the magnitude of reported associations. The current study sought to address this limitation by examining within-person, day-to-day fluctuations in perceived discrimination as a predictor of day-to-day variability in sleep. The role of internalized racism as a moderator of the association between discrimination and sleep was also examined. Participants were African American college students attending a predominantly white institution (N = 138, 23% male, Mean age = 19.1, SD = 1.5). Each student was asked to complete a baseline questionnaire and a nine day diary. Experiences of discrimination were assessed in a baseline questionnaire using the Racism and Life Experiences Scale (RaLES; Harrell, 1994; Utsey, 1998). A 21-item parallel measure was created and sum scored to assess daily experiences of discrimination. Sleep problems were assessed each day and were scored as the average of two items: how difficult was it to get to sleep last night, and how well rested did you feel this morning. Internalized racism using a five-item measure from the Cross Racial Identity Scale, which captures how strongly participants associate negative characteristics such as laziness and criminality with their racial/ethnic group (Vandiver, Cross, Worrell, & Fhagen-Smith, 2002). Analyses for this study were in progress at the time of this abstract submission. Preliminary results suggest that on days when participants experience more discrimination, subsequent sleep problems increase. Initial findings also suggest that this within-person association is moderated by internalized racism such that the association between discrimination and sleep problems is more pronounced among those who more strongly associate negative characteristics with their racial/ethnic group.

Abstract 1832

RACISM, SOCIAL COGNITION AND DEPRESSION: RESULTS OF A PILOT LONGITUDINAL STUDY

Elizabeth Brondolo, Ph.D., Dantong Xu, BS, Psychology, St. John's University, Jamaica, NY, Irene Blair, Ph.D., Psychology, University of Colorado, Boulder, Boulder, CO

Discrimination of all types is consistently associated with depressive symptoms and other health outcomes. Researcher have suggested that the effects of discrimination on health may be mediated by social cognition, including the schemas or mental representations individuals hold about themselves and others. Specifically, discrimination may heighten the salience and centrality of one's racial identity. Heightened racial centrality may increase concerns about being judged, invalidated and rejected because of one's race, but may also increase the strength of same-race bonds. Consequently, discrimination may heighten exposure to interpersonal stressors which can trigger and maintain depressive symptoms and further segregate individuals.

We provide a preliminary test of these hypotheses in a pilot study of African American young adults (ages 18-28 years; 55% women), tested five times over an eight-month period (n at Time 1 = 47). Discrimination was assessed with the Brief Lifetime Perceived Ethnic Discrimination Questionnaire-Community Version (Brief PEDQ-CV; Brondolo et al, 2005). Racial centrality was assessed using the Multidimensional Model of Black Identity (MIBI; Sellers et al., 1998). Measures of relational schemas included the Stereotype Confirmation Concern Scale (Contrada et al., 2001), Own Group Conformity Pressure Scale (Contrada et al., 2001), Social Constraints Scale (Lepore, 1996), Social Vigilance Questionnaire (Ruiz, 2015) and the Cook-Medley cynicism and hostile attributions subscales (Barefoot et al, 1999).

Multi-level regression models (Proc Mixed, SAS 9.4) indicate that increases in exposure to racial/ethnic discrimination predicted increases in racial centrality (Est = .44, SE = .19, t = 2.35, p = .03). In turn, increases in racial centrality were positively associated with increases in stereotype confirmation concerns (Est = .37, SE = .14, t = 2.54, p = .0179, CI: .069 – .67), and cynicism (Est = .04, SE = .02, t

= 2.50, p = .0236, CI: .0062 – .075). Increases in stereotype threat (Est. = .17, SE = 0.04, t = 3.96 p < 0.0002, CI: = 0.084 - 0.25), but not racial centrality or cynicism were associated with increases in depressive symptoms. Relations of racial centrality to some relational schemas were also bidirectional, suggesting that the effects of discrimination on social cognition may trigger and then maintain depressive symptoms.

Abstract 1830

CULTURE AND STRESS REACTIVITY: AN EXAMINATION OF SIMPATIA

Amanda M. Acevedo, BA, Vida Pourmand, B.S., Psychological Science, Clara Herrera, B.A., Chicano/Latino Studies, Sharon Shenhav, PhD, Ilona Yim, PhD, Psychological Science, Belinda Campos, PhD, Chicano/Latino Studies, University of California, Irvine, Irvine, CA

What is the role of cultural values during stress? In study 1, we examined how simpatía, a Latino cultural value that emphasizes positive emotions and warm social interactions, is associated with physiological reactivity and social behaviors during a standardized social evaluative stressor in a sample of women and men of Latino background. Using the literature on positive emotions and stress, we hypothesized that greater simpatía would be associated with a reduced physiological stress response. Additionally, given that previous literature has found effects of simpatía to be moderated by gender, we examined the role of gender in our analyses. Simpatía was associated with observed social smiling behaviors during a standardized stressor, however, this association varied by gender. Simpatía and gender also moderated physiological reactivity such that only males high in simpatía exhibited a reduced physiological response to the standardized stressor. In Study 2, we again examined whether simpatía in a sample of individuals of Latino background was associated with physiological reactivity and behaviors in the context of an acute *painful* stressor. The data cleaning and analyses for examining the role that simpatía and gender play in the physiological response to acute pain is currently underway. These findings will contribute to our understanding of the complex interplay of Latino culture, psychology, and health-relevant physiology in the context of different types of stress.

Abstract 1752

DO SOCIAL NETWORK MEASURES OR SOCIAL SUPPORT EXPLAIN THE ETHNIC DENSITY EFFECT ON HEALTH FOR OLDER LATINXS AND OTHERS?

Melissa Flores, Ph.D., Center for Border Health Disparities, Health Sciences, John Ruiz, Ph.D., Psychology, The University of Arizona, Tucson, AZ

A phenomenon termed the "ethnic density effect" occurs when Latinx individuals residing in US are healthier when living in communities with higher proportions of Latinxs (Bécares et al., 2012). The ethnic density (ED) effect may also extend to other non-Latinx individuals (Shaw & Pickett, 2013). An underlying mechanism that may explain this phenomenon is the presence of high levels of social integration, which may be facilitated by Latinx cultural dynamics (Shell, et al., 2013). **Purpose.** The purpose of this study was to test whether network structure or social support mediate the relationship between ED and good health as measured by depressive symptoms and morbidity across all racial-ethnic groups. **Method.** Data from two waves of the National Social Life, Health, and Aging Project (NSHAP) will be utilized for this study, N = 3377. Ethnic density is defined as the of percent-Latinx (%L) individuals residing within a census tract defined by the 2010 Census. Respondents' addresses were geo-coded to a census tract and racial-ethnic population data was subsequently overlaid. To handle the interdependency of spouses, two approaches were utilized: GLS models with correlated error structures were estimated to assess continuous outcomes, and random-effects GLMs with a Poisson distribution were estimated to assess count-outcomes. **Preliminary Results.** Utilizing only wave 2 data, no ED effect for depressive symptoms was found for the total sample. However, the association between %L and depressive symptoms was moderated by ethnicity such that Latinx individuals (vs. non-Latinx) had lower depressive symptoms, b = -.44, se = .11, p < .001, 95% CI[-.66, -.22]. For the total NSHAP sample a 10% increase in ED was associated with a significant decrease in morbidity, b = -.02, se = .004, p = .007, 95% CI[-.03, -.004]. These associations were not mediated by network structure and were mediated by social support, but not in the direction we hypothesized. Social support was an inconsistent mediator of the relation between ED and depressive symptoms, indirect effect = .05, 95% CI[.02, .08] and a suppressor of the relation between ED and morbidity, indirect effect = .001, 95% CI[.0003, .003]. **Next Steps.** Our future aims are two-fold: 1) to examine these associations over time (i.e. both waves of NSHAP), and 2) to test whether race-ethnicity moderates the mediation effects reported.

Abstract 1656

FOR BETTER OR FOR WORSE: MARITAL STATUS PREDICTS INFANT BIRTH WEIGHT FOR PREGNANT HISPANIC WOMEN

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Background: Low birth weight is a primary cause of infant mortality. In general social relationships have been shown to predict adverse health problems, including low infant birth weight (Feldman, Dunkel-Schetter, Sandman, & Wadha, 2000). Socioeconomic factors have also been demonstrated to be relevant such that those who are low socioeconomic status (SES) have lower infant birth weights than those that are higher SES (Zeka, Melly, & Schwartz, 2008). However, there is little work identifying specific risk factors in the Hispanic population. This study aimed to identify whether marital status influenced the birth weight of children of Hispanic women. **Methods:** We utilized a subset of 421 Hispanic women in Texas assessed between 2008-2011 as part of a larger study examining biological and psychosocial factors associated with low birth weight and preterm birth. Participants were between 22-24 weeks gestation when they completed the questionnaire portion of the study. We ran a multiple linear regression predicting birth weight (assessed continuously in grams), which included age, income, maternal depressive symptoms, viral infections, acculturative stress, and pre-pregnancy BMI (F(9, 411) = 2.12, p= .027). **Results:** Being married predicted 128 additional grams in birthweight (p= .037). Interestingly, socioeconomic factors and depressive symptoms did not explain this finding. **Conclusions:** The contribution of family structure toward reduced birth weight warrants further investigation to identify vulnerabilities and avenues for interventions among at-risk pregnant Hispanic women. We are currently examining how latent herpesvirus reactivation impacts these findings.

Linking Neighborhoods to Health
Thursday, March 7 from 1:15 to 2:15 pm

Abstract 1136
CONCENTRATED NEIGHBORHOOD PRIVILEGE ATTENUATES THE RELATIONSHIPS BETWEEN HOUSEHOLD INCOME, PULMONARY FUNCTION, AND QUALITY OF LIFE AMONG YOUTH WITH ASTHMA
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Despite advances in medical treatment, youth from lower-income families experience disproportionate risk for asthma-related morbidity and mortality. Evidence from other disease contexts suggests the neighborhood environment may reduce these inequalities. However, this hypothesis has yet to be tested in pediatric asthma.
We enrolled 308 youth ages 8-17 who were physician-diagnosed with asthma. Youth were recruited from the Chicago metropolitan area and came from diverse racial/ethnic backgroundsAcross outcomes, we observed a main effect whereby neighborhood privilege was associated with better health. We also observed an interaction in which lower-income youth living in privileged neighborhoods seem to be protected. In disadvantaged neighborhoods, lower household income was associated with lower AQOL and PEF across laboratory and ambulatory settings. However, when youth lived in privileged neighborhoods, there was no relation between household income and pulmonary function or AQOL.
These findings suggest that neighborhoods with concentrated privilege may buffer lower-income youth against asthma inequalities reported in previous literature. Future studies should investigate the neighborhood as a potential site of intervention to improve the outcomes of youth from lower-income families living with asthma.

Abstract 1074
LINKING PERCEIVED AND NEIGHBORHOOD STRESS AND CARDIOVASCULAR RISK AS A FUNCTION OF ACCULTURATION AND SOCIOECONOMIC STATUS IN MEXICAN AMERICANS: IMPLICATIONS FOR THE LATINX HEALTH PARADOX
Maryam Hussain, PhD, Psychological Sciences, University of California, Merced, Merced, CA, M. Kristen Peek, PhD, Dept of Preventive Medicine and Community Health, University of Texas Medial Branch, Galveston, TX, Raymond P. Stowe, PhD, Microgen Laboratories, LaMarque, TX, Matthew Zawadzki, PhD, Psychological Sciences, University of California, Merced, Merced, CA
Cardiovascular disease (CVD) is the number one killer of Latinx Americans. Stress has been identified as a risk factor for CVD, yet this link has rarely been examined in US Latinx individuals despite high levels of reported stress. This paper examined the link between stress and CVD risk, operationalizing stress both in terms of individual perceptions (perceived stress) and perceptions of one's neighborhood (neighborhood stress). In doing so, it tested whether acculturation and socioeconomic status (SES) moderated this relationship given the importance of these variables for understanding the Latinx health paradox (that some Latinx groups have better health than their non-Hispanic White counterparts despite having lower SES). We analyzed data from the Texas City Stress & Health Study, which originally examined sociobiological stress in a heavily Mexican-American region. Our study comprised participants ≥ 39.5 years of age with CVD risk factors data (N = 397; M_{age} = 58 years; 56.9% female; 57% < 12 years education; 79% US-born Mexican American, 21% Mexican-born). We assessed perceived stress, neighborhood stress, acculturation, SES (education levels), and CV variables (i.e., cholesterol, blood pressure, history of smoking, diabetes, and hypertension treatment). Participants' data were used to estimate CVD risk over the next 10 years per the ASCVD algorithm, showing an average 18% chance of 10-year CVD risk. Multivariate regressions were run with stress (perceived and neighborhood stress tested in separate models), acculturation, SES, and their interactions predicting CVD risk. Findings show three-way interactions for both perceived stress (p < .05; model; R^2 = .16), and neighborhood stress (p = .05; model R^2 = .11). Less acculturated individuals with higher levels of education and lower levels of overall perceived or neighborhood stress were more likely to have higher CVD risk. These findings highlight aspects of the Latinx health paradox in that more acculturation and SES seemingly contribute to poorer health in this population, suggesting potential negative health consequences of upward social mobility. However, this paradox is not so straightforward and future research should explore compounding between-group factors (e.g., nativity, residential segregation, social support) that may play a role in creating health disparities within the Latinx group.

Abstract 1535
DOES NEIGHBORHOOD WALKABILITY AND AREA DEPRIVATION CORRELATE WITH PHYSICAL ACTIVITY AMONG RECENTLY HOSPITALIZED PATIENTS WITH SYSTOLIC HEART FAILURE AND CO-MORBID DEPRESSION?
Julia P. Holber, B.A., Yan Huang, MAS, Kaleab Z. Abebe, PhD, Amy Anderson, MS, LPC, Division of General Internal Medicine, John M. Jakicic, PhD, School of Education, Bea Herbeck Belnap, PhD, Bruce L. Rollman, MD, MPH, Division of General Internal Medicine, University of Pittsburgh, Pittsburgh, PA
Background: Neighborhood walkability and socioeconomic advantage have been associated with residents' levels of physical activity, yet few studies have examined these relationships among the medically ill. We examined this issue among recently hospitalized patients with heart failure (HF) and co-morbid depression we enrolled into an NIH-funded collaborative care trial.
Methods: We administered the Patient Health Questionnaire (PHQ-2) to screen inpatients with systolic HF (ejection fraction ≤45%) and NYHA class II-IV symptoms for depression at 8 Pittsburgh hospitals; telephoned screen-positive consented patients 2-weeks later to confirm eligibility (PHQ-9≥10); and mailed eligible participants a Bodymedia armband accelerometer with instructions to wear it for 7 days and return it to us. We classified their data as "usable" if they wore the device for ≥10 hours on 4 separate days. We linked their home address to a unique neighborhood Walk Score which measures distance to amenities (businesses, parks, etc) (www.walkscore.com) and used the University of Wisconsin's Neighborhood Atlas to determine area deprivation index (ADI) (www.neighborhoodatlas.medicine.wisc.edu). We then calculated univariate Pearson correlation coefficients between median daily step counts, Walk Score, and ADI and calculated standardized beta coefficients using multivariable regressions with step counts adjusted for age, gender, and NYHA class.
Results: Of the 629 depressed study patients, 223 provided usable armband data (mean age: 64 (IQR=523-2580), 57% male, 77% Caucasian, NYHA: 28% class II, 60% class III). Overall, patients tended to be inactive (median daily steps: 1,170 (IQR=523-2,580)), and their activity varied by NYHA class (median steps: class II: 1,969, class III: 1,110, and class IV: 850 steps a day (P=0.002)) but not with neighborhood Walk Score (P=0.20) or ADI (P=0.67).
Conclusions: Regardless of neighborhood Walk Score or ADI, patients with systolic HF and co-morbid depression tend to be highly inactive following hospital discharge. Future analyses will examine the longitudinal impact of Walk Scores and ADI on changes in physical activity, mood, and cardiovascular outcomes following

hospital discharge to inform the development of new interventions for this patient population.

Abstract 1461

COMMUNITY SOCIOECONOMIC DISADVANTAGE ASSOCIATES WITH PRECLINICAL VASCULAR DISEASE VIA ALTERED CORTISOL ACTIVITY

Karissa Miller, PhD, Psychology, California State University, Long Beach, Long Beach, CA, Peter Gianaros, PhD, Thomas Kamarck, PhD, Psychology, Matthew Muldoon, MD, Medicine, Stephen Manuck, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA

Residence in communities of socioeconomic disadvantage heightens risk of atherosclerotic cardiovascular disease (CVD) and has been associated with preclinical carotid artery atherosclerosis. Cumulative epidemiological research suggests that alterations in diurnal cortisol activity may correspond to a pathway linking community disadvantage to CVD risk. The current study examined this hypothesis in relation to a surrogate marker of preclinical atherosclerosis (carotid intima-media thickness, cIMT), among 488 healthy midlife adults (30-54 years, Mean age= 43, 48% Female, 75% White). All participants were employed and without clinical CVD. Community disadvantage was estimated from census tract data (% on public assistance and below the poverty line, unemployment rates, and reverse-scores of educational attainments and median household incomes). cIMT was measured by ultrasonography (in mm). Cortisol activity normatively shows a steep diurnal decline, and was assessed here as the diurnal slope derived from 4 logged salivary measurements obtained on each of 3 working days. Path analysis tested associations of community disadvantage with cIMT and whether diurnal slope statistically explained (mediated) such a relationship using bootstrapping (5000 iterations). All models were adjusted for age, sex, race, and composite measures of both individual-level socioeconomic status (income, education, occupation), and cardiometabolic risk (systolic blood pressure, waist circumference, fasting lipids and glucose). Greater community disadvantage related to both higher cIMT (b= .006, p=.002), and a flatter diurnal slope (b=.002, p=.001). An indirect effect indicated that diurnal slope mediated the relationship between disadvantage and cIMT (95% CI = -.0018 to -.0001). A direct effect showed that there was partial, but not full, mediation of this relationship (95% CI = -.0097 to -.004). These results suggest that living in disadvantaged communities associates with early vascular disease, due in part to alterations in cortisol activity.

Supported by NIH Grant HL040962

Mental Health

Friday, March 8 from 1:30 to 2:45 pm

Abstract 1726

RACIAL DIFFERENCES IN THE EFFECTIVENESS OF COMPUTERIZED COGNITIVE BEHAVIORAL THERAPY FOR MENTAL HEALTH DISORDERS

Charles R. Jonassaint, PHD, Bea Belnap, PhD, Bruce L. Rollman, MD, Medicine, University of Pittsburgh, Pittsburgh, PA

Clinical trials confirm computerized cognitive behavioral therapy (CCBT) is effective at treating depression. However, these programs were tested in predominately white patients and we cannot assume CCBT will be similarly effective for racial and ethnic minorities. To address this issue, we compared the effectiveness of CCBT at treating depression and anxiety among white and African American (AA) primary care patients who enrolled into a NIMH-funded clinical trial.

METHODS

We enrolled and randomized 704 depressed and anxious primary care patients aged 18-75 from from 26 Pittsburgh-area practices who met eligibility criteria (PHQ-9 or GAD-7 score ≥10) in a 3:3:1 ratio to either (1) guided access to the proven-effective Beating the Blues CCBT program with 6-months of care manager support (CCBT-alone), (2) CCBT-alone plus access to a moderated Internet Support Group (CCBT+ISG), or (3) their PCP's usual care (UC). Prior analyses demonstrated no additional effect of the ISG program so we combined the two CCBT groups (CCBT; N=590, 91 AA, 499 white) and compared them to UC (N=99, 22 AA, 77 white). We then examined race differences for impact of CCBT versus UC at 6-months follow-up on mental health-related quality-of-life (HRQoL; SF-12 MCS), and depression and anxiety (PROMIS measures) with mixed models.

RESULTS

The majority of participants were female (79.8%), mean age was 42.7 (SD=14.3) years. Compared to the UC group at 6-months follow-up, whites randomized to CCBT reported similar ratings of HRQoL and mood and anxiety symptoms (SF-12 MCS (p=.40); PROMIS Depression (p=.10) and Anxiety (p=.18)), while AAs had significant decreases on PROMIS-Depression (d= -.47, p<.01) and Anxiety (d=-.54, p<0.01). Three-way interaction testing revealed a differential marginal benefit of CCBT on anxiety (p=.054) for AAs but not whites.

Because poor adherence can limit the benefits of CCBT, we tested the association between the number of CCBT sessions completed (CCBT#s) and outcomes by race. While for whites CCBT#s was associated with improvements in all clinical outcomes, for AAs, CCBT#s only conferred benefit on anxiety symptoms (p=.014).

CONCLUSIONS

CCBT showed greater mental health benefit for AAs than whites independent of the number of completed CCBT sessions. CCBT may be an efficient and scalable first step to improving mental health care for racial/ethnic minorities.

Abstract 1227

PREDICTORS OF BEHAVIORAL TREATMENT RESISTANCE IN PTSD: A MONOCYTE GENOMICS EXPRESSION SIGNATURE

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Background: Whereas exciting progress has been made in depression using inflammatory biomarkers to predict treatment resistance and guide precision medicine, similar applications to PTSD are lacking, despite their promise. A prevalent cause of PTSD among women and children is interpersonal violence (IPV), and Child Parent Psychotherapy (CPP) is the leading evidence-based treatment for IPV-exposed maternal-child dyads, although there is variability in the response. Given the inflammatory alterations in PTSD, we investigated whether a molecular signature of relative pro-inflammatory imbalance would predict poorer treatment response to CPP. **Hypotheses:** Greater maternal M1/M2b polarization (indicating a ratio of pro-inflammatory to pro-resolving genes) and pro-inflammatory IL-1ß cytokine levels will prospectively predict poorer behavioral treatment response to CPP, indexed by lesser reductions in PTSD and depressive symptoms (DEP) among mothers and their children. **Methods:** We assessed PTSD and DEP at baseline and after roughly one year of CPP, in a diverse, low socioeconomic status cohort of mother-child dyads exposed to IPV. Maternal blood was drawn, serum IL-1ß was assayed (n=43), and gene expression was assayed in CD14+ monocytes by RNA sequencing (n=35; Illumina HiSeq 4000; TruSeq cDNA library). M1/M2b was computed as the ratio of log2-normalized counts for *a priori*-defined gene sets. Treatment response was quantified by residualized change scores. **Results:** Overall, CPP significantly reduced PTSD and DEP symptoms for mothers and children (*all p's*<.05). Nonetheless,

greater pre-CPP M1/M2b polarization and IL-1ß both predicted poorer maternal treatment response, per lesser reductions in PTSD symptoms (respectively B=.51, p=.01; B=.32, p=.03) adjusting for maternal age, BMI, ethnicity, and antidepressant use (and in unadjusted analyses). M1/M2b predicted significantly poorer maternal DEP response (B=.64, p<.01); IL-1ß was marginal (B=.26, p=.09). Higher maternal IL-1ß predicted lesser reductions in child PTSD symptoms (B=.38, p<.01). **Conclusions:**Among women and children exposed to IPV, higher maternal inflammation and M1/M2b-like polarization phenotypes predicted behavioral treatment resistance to CPP over the following year, inviting the prospect that precision medicine interventions might target immune pathways.

Abstract 1114

INCREASED RATES OF REWARD-RELEVANT LIFE EVENTS PREDICT NEURAL RISK FOR BIPOLAR DISORDERS IN REWARD-HYPERSENSITIVE INDIVIDUALS

Iris Ka-Yi Chat, MA, Corinne P. Bart, MA, Tommy H. Ng, MA, Daniel P. Moriarity, MA, Psychology, Temple University, Philadelphia, PA, Robin Nusslock, PhD, Gregory E. Miller, PhD, Psychology, Northwestern University, Evanston, IL, Lauren B. Alloy, PhD, Psychology, Temple University, Philadelphia, PA

Background: Growing research suggests that reward hypersensitivity and immune dysfunction jointly confer risk for bipolar spectrum disorders (BSDs), which is characterized by an altered reward-related neural profile. However, the mechanisms underlying the joint effect remain unclear. One possible mechanism is that reward-hypersensitive individuals experience more inflammation-inducing stress reactivity due to their excessive response to reward cues when exposed to reward-relevant life events. The present study examined this proposed mechanism. We predicted that exposure to increased rates of reward system-activating (Rew-A) and deactivating (Rew-D) events in reward-hypersensitive participants (Ps) would be associated with greater activation in the reward neural circuit. Furthermore, increased rates of these events would be associated with higher inflammatory activity. **Method:** Ps were 82 adults (mean age=21.01 years; 52.44% female) from an ongoing prospective, longitudinal study on risk for BSDs. Ps were categorized into high reward (HR) and moderate reward (MR) sensitivity groups based on their scores on the Behavioral Activation System (BAS) and Sensitivity to Reward scales. Serum collected via antecubital venipuncture was assayed using the Meso Scale Discovery Human Proinflammatory 7-Plex Base Kit for pro-inflammatory cytokine interleukin-6 (IL-6). Ps also completed the Monetary Incentive Delay (MID) task during an fMRI scan to assess neural activity during reward anticipation. The a priori regions of interest (ROIs) were orbitofrontal cortex (OFC) and ventral striatum (VS). Rates of reward-relevant events within one year prior to the fMRI scan were measured with the Life Events Interview. **Results:** Compared to MR Ps, HR Ps with higher rates of Rew-A events exhibited greater OFC (b=.10, p<.01, ΔR^2=.11) and VS (b=.15, p<.01, ΔR^2=.09) activation during reward anticipation. HR Ps with higher rates of Rew-D events also exhibited greater OFC (but not VS) activation during reward anticipation, b=.072, p<.01, ΔR^2=.084. Higher rates of both Rew-A (r=.27, p<.05) and Rew-D events (r=.46, p<.001) were associated with higher IL-6 levels. **Conclusion:** Excessive response to reward-relevant life events may trigger risk for reward-related neural abnormalities in reward-hypersensitive individuals. These events also may activate neuroimmune pathways involved in risk for BSDs.

Abstract 1425

LIFETIME STRESS EXPOSURE IS ASSOCIATED WITH NUMBER OF LIFETIME SUICIDE ATTEMPTS IN PSYCHIATRIC OUTPATIENTS WITH SUICIDAL IDEATION: A STRESSOR CHARACTERISTICS APPROACH

Tory A. Eisenlohr-Moul, PhD, Psychiatry, Psychology, University of Illinois at Chicago, Chicago, IL, Grant S. Sheilds, M.A., Psychology, University of California Davis, Davis, CA, Madeline M. Divine, B.S., Psychiatry, University of Illinois at Chicago, Chicago, IL, Sarah Owens, M.A., Psychology, University of North Carolina at Chapel Hill, Chapel Hill, NC, George Slavich, PhD, Cousins Center for Psychoneuroimmunology and Department of Psychiatry and Biobehavioral Sciences, University of California Los Angeles, Los Angeles, CA

Background. Multiple lines of research have demonstrated that acute and chronic stress exposure is associated with risk for attempting suicide. However, these studies typically measure stress using approaches that have critical limitations in both precision and coverage. Additionally, this work is often conducted in low-to-moderate-risk samples that have low overall suicidality.

Methods. To address these issues, we are recruiting females (n=12 to date of 40 expected; mean age = 32.2 yrs) with past-month suicidal ideation receiving treatment as usual. All participants have two or more DSM-5 diagnoses, assessed via SCID-5. Participants are enrolled in the baseline phase of an experimental study of endocrine and immune factors in suicidality. The preliminary analyses described here examined associations between aspects of lifetime stress exposure, as assessed using the Stress and Adversity Inventory for Adults (STRAIN), and number of lifetime suicide attempts, indexed as total of attempts, aborted attempts, and interrupted attempts on the Self-Injurious Thoughts and Behaviors Interview.

Results. Number of lifetime suicide attempts ranged from 0-7, and was positively correlated with Total Count of Stressors (r = .67), Total Severity of Acute Life Events (r = .71), and Total Count of Chronic Difficulties (r = .47) across the lifespan. Applying a stressors characteristics approach revealed that these relations are explained by stressors related to Housing (Total Severity, r = .81; Severity of Acute Life Events, r = .69), Life-Threatening Situations (Total Severity, r = .66; Count of Acute Life Events, r = .71), Death (Count of Acute Life Events, r = .59), and Physical Danger (Total Count, r = .74; Total Severity, r = .77; Count of Acute Life Events, r = .73; Severity of Acute Life Events, depicted below, r = .81; and Severity of Chronic Difficulties, r = .52).

Conclusions. In preliminary analyses, threats to health and safety were most robustly associated with number of attempts. This may be due to the impact that severe traumas have on severity of psychological suffering and suicidal desire, or they may be due to an effect of "painful and provocative events" on acquired capability for suicide attempt. Future work should examine these pathways among individuals with suicidal ideation.

Data collection is in progress, and final analyses will be complete before March 6.

VIEW PDF

Abstract 1501

INTERGENERATIONAL ASSOCIATIONS BETWEEN LIFETIME STRESS EXPOSURE IN MOTHERS WITH VARYING DEPRESSION HISTORY AND THEIR DAUGHTERS.

Mark R. Libowitz, B.S. in progress, Evelyn Valencia, B.A. in progress, Kishan Ghadiya, B.S. in progress, Theresa Bui, B.S., Stassja Sichko, B.A., Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA, Grant S. Shields, M.A., Psychology, University of California, Davis, Davis, CA, George Slavich, Ph.D., Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA

Background: Research has shown that daughters of mothers with a depressive history are at greater risk of developing depression than daughters of non-depressed mothers. One possible explanation is that risk is transmitted through the daughters' exposure to her mothers' stressful environment. We investigated this idea by exploring whether mothers' lifetime stress predicted daughters' lifetime stress in various domains, and whether these associations differed based on mothers' depression history. Daughters at low and high risk for depression were thus analyzed together and then separately to examine the extent to which mothers' stressful life conditions were associated with those of their daughters.

Methods: 23 mothers (M_{age}*=46.64, SD=6.38)* and daughters (M_{age}*=15.09, SD=1.27*) completed the Stress and Adversity Inventory (Slavich & Shields, 2018). 13 low-risk pairs (i.e. daughters with mothers with no history of depression) and 10 high-risk pairs (i.e. daughters with mothers with at least one major depressive episode) were assessed.

Results: Simple regressions for all mother-daughter pairs revealed positive associations between mothers' and daughters' severity of overall housing-related stressors (R^2=.45, p=.029). Mothers' overall severity of financial stress was indicative of daughters' severity of financial stress (R^2=.21, p=.018). Mothers' severity of chronic entrapment-related stressors was also positively correlated with those of their daughters (R^2=.14, p=.048).

Results also showed group-specific associations. For the high-risk group, mothers' count (R^2=.79, p<.001) and severity (R^2=.66, p=.005) of acute housing-related events predicted those of their daughters. In the financial domain, high-risk daughters' count of acute life events (R^2=.50, p=.020) and chronic difficulties (R^2=.56, p=.013) were predicted by those of her mother. These daughters' severity of acute partner-related events (R^2=.48, p=.023) was also predicted by their mothers'.

Discussion: Overall, mothers' lifetime stress predicted daughters' lifetime stress across several domains. These associations were more prevalent among the high- than low-risk group. Evaluating these mother-daughter relationships could be important for better understanding and decreasing risk of depression in youth. Further analysis with a larger population size is needed to determine the robustness of these associations.

Mindfulness Interventions

Thursday, March 7 from 11:00 am to 12:00 pm

Abstract 1043

A RANDOMIZED CONTROLLED TRIAL OF A MINDFULNESS INTERVENTION FOR GRIEF IN WIDOWS AND WIDOWERS

Lindsey M. Knowles, MA, Krystal S. Jovel, BS, Psychology, Candace Mayer, BS, Health Promotion Sciences, Kenneth C. Bottrill, BS, Alfred W. Kaszniak, PhD, David A. Sbarra, PhD, Mary-Frances O'Connor, PhD, Psychology, University of Arizona, Tucson, AZ

Background: Bereavement is associated with increased risk for morbidity and all-cause mortality across epidemiological, meta-analytic and case-control studies. Following a death, prolonged and intense yearning and grief rumination are repetitive cognitive processes that can promote a complicated course of grief. Mindfulness training (MT) has been shown to reduce maladaptive repetitive thought in healthy and clinical populations. The current randomized controlled trial (RCT) implemented a MT intervention for widow(er)s to examine the feasibility, acceptability, and preliminary efficacy of MT for improving grief outcomes and to test the mediating effects of yearning and grief rumination on grief severity.

Method: Ninety-five people who experienced the death of a spouse or romantic partner between six months to four years prior were randomly assigned to a 6-week MT intervention or a Progressive Muscle Relaxation (PMR) intervention, or quasi-randomized to a wait-list condition. Self-reported psychosocial outcomes were assessed at baseline, post-intervention, and 1-month post-intervention. Yearning, grief rumination, decentering, and grief severity were assessed at two additional time points at weeks 2 and 4 of the intervention/wait-list period.

Results: Controlling for relevant covariates, the MT and PMR groups showed significant declines in grief severity and yearning from baseline to the 1-month follow-up, though only the PMR group showed a significant difference in rates of change compared to the wait-list control group. Multi-level mediation analyses revealed that reductions in yearning mediated the declines in grief severity. The MT, PMR, and wait-list groups showed significant decreases in grief rumination across intervention time points for all but one grief rumination subscale. Last, the PMR and wait-list groups showed significant increases in decentering across study time points whereas the MT group did not experience significant change.

Conclusion: The results of this first RCT of a MT intervention in widow(er)s support the feasibility, acceptability, and preliminary efficacy of MT and PMR for improving grief outcomes, and suggest that PMR is most effective compared to the wait-list control. With replication, PMR and MT could be standalone interventions for normative grief or components added to treatments for disordered grief.

VIEW PDF

Abstract 1132

COGNITIVE BEHAVIORAL THERAPY, MINDFULNESS, AND CORTISOL HABITUATION: A RANDOMIZED CONTROLLED TRIAL

Andrew W. Manigault, M.S., Psychology, Ohio University, Athens, OH, Ryan C. Shorey, Ph.D., Psychology, University of Wisconsin-Milwaukee, Milwaukee, WI, Katrina Hamilton, M.S., Matt C. Scanlin, M.S., MPH., Cari R. Hollenbeck, M.S., Psychology, Ohio University, Athens, OH, Alex Woody, Ph.D., Institute for Behavioral Medicine Research, Wilson S. Figueroa, Ph.D., Wexner Medical Center, Ohio State University, Columbus, OH, Christopher R. France, Ph.D., Haley W. Appelmann, Dip., Peggy M. Zoccola, Ph.D., Psychology, Ohio University, Athens, OH

Poor hypothalamic-pituitary-adrenocortical (HPA) axis habituation (i.e., a failure to show decreased responding with repeated stressor exposure) may lead to excessive cortisol exposure and disease. Thus, stress management training that can enhance HPA axis habituation may benefit health. Yet, the effects of prevalent stress reduction interventions like Mindfulness Based Stress Reduction (MBSR) and Cognitive Behavioral Therapy (CBT) on HPA axis habituation remain untested. To address this knowledge gap, the present study employed a parallel arm randomized controlled trial to test the effects of MBSR and CBT on HPA axis habituation.

Participants (138 adults reporting moderate to high perceived stress, aged 18-50, 62% female) were randomly assigned to either a 6-week MBSR intervention, a 6-week CBT intervention, or a waitlist control. Following the intervention, participants completed the Trier Social Stress Test on two separate laboratory visits (48 hours apart). Salivary cortisol was assessed pre-stressor and +25, +35, and +60 minutes post-stressor during both laboratory visits.

The CBT group showed significantly greater cortisol habituation (i.e., a greater decrease from visit 1 to visit 2) for recovery samples obtained 35- and 60-minutes post-stressor ($t(451)=2.51$, $p=.012$, and $t(451)=2.15$, $p=.031$) relative to the waitlist. Similarly, MBSR showed marginally greater cortisol habituation than the waitlist for recovery samples ($t(451)=1.88$, $p=.060$, and $t(451)=1.79$, $p=.074$). Additionally, the CBT group showed greater reductions in cortisol from visit 1 to visit 2 at baseline and at the expected peak (i.e., 25 minutes post-stressor onset) compared to the Waitlist ($t(451)=2.54$, $p=.011$, $t(451)=2.51$, $p=.012$). During the initial visit, the MBSR group had a more peaked cortisol response than CBT ($t(232)=2.43$, $p=.015$). Participants assigned to the CBT condition had significantly greater baseline cortisol levels during the initial visit relative to MBSR ($t(232)=2.18$, $p=.030$) or the waitlist ($t(232)=3.33$, $p=.001$), whereas participants assigned to MBSR or the waitlist did not significantly differ ($p=.15$).
In summary, both MBSR and CBT facilitate HPA axis habituation; however, they appear to elicit different cortisol responses during initial stressor exposure. MBSR may lead to more peaked responses during initial exposure whereas CBT may promote anticipatory responding.

VIEW PDF

Abstract 1722

THE MODERATING EFFECTS OF DISTRESS TOLERANCE AND EXPECTATIONS ON A MINDFULNESS INTERVENTION DURING STEREOTACTIC BREAST BIOPSY

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BACKGROUND: Brief training in mindfulness meditation may reduce anxiety and discomfort during a variety of stressful situations, including stereotactic breast biopsy (SBB). Training in mindfulness may be particularly beneficial for individuals high in discomfort intolerance (DI). Additionally, expectation of the benefits of psychosocial interventions may influence their effectiveness. Our prior RCT found that guided meditation (GM) relative to focused breathing (FB) or standard care (SC) lead to steeper decline in anxiety levels across the course of SBB. We sought to examine the moderatingeffects of DI and expectations.
METHODS: This is a secondary analysis of an RCT examining the effect of GM (n=30), FB (n=30), or SC (n=16) on anxiety and pain for women undergoing SBB. Anxiety and Pain (Visual Analogue Scale (VAS-anx, VAS-pain), DI, and expectations of the benefits of relaxation on anxiety and pain were assessed at baseline, and VAS-anx and VAS-pain were assessed every 4 min during SBB, and after SBB.
RESULTS: Multilevel modeling revealed a significant DI x group x time effect on anxiety during the procedure ($p = 0.04$).The interaction was decomposed into high and low DI (half SD above and below the mean). The group x time effect on anxiety during the biopsy was significant for women with high and low DI (p's < 0.01). Pairwise comparison revealed women high in DI experienced a steeper reduction of anxiety during the biopsy if they were in GM or FB, compared to SC (p's < 0.01). For Women with low DI experienced a steeper reduction in anxiety if they were in GM compared only to FB ($p < 0.01$). The group x time x DI interaction effect on pain reported during the biopsy was not significant. Expectations did not moderate the effect of group on anxiety or pain during or after the biopsy.
CONCLUSIONS: The effect of guided meditation and focused breathing on anxiety during SBB depends on one's tolerance of discomfort. Specifically, for women high in discomfort intolerance, guided meditation and focused breathing interventions both led to reduced anxiety compared to standard care. However, women low in discomfort intolerance derived greater benefit in terms of anxiety reduction from the guided meditation compared to the focused breathing. Compared to focused breathing, mindfulness may be particularly well suited for individuals low in discomfort intolerance.

Abstract 1740

SPIRITUAL WELLBEING AS A MODERATOR OF BRIEF MINDFULNESS INTERVENTION ON ANXIETY DURING STEREOTACTIC BREAST BIOPSY

Shaelyn Fowler, BS, Chelsea Ratcliff, PhD, Emily Tullos, BA, Psychology, Sam Houston State University, Huntsville, TX, Sarah Prinsloo, PhD, Alejandro Chaoul, PhD, Wei Yang, MD, Lorenzo Cohen, PhD, Palliative, Rehabilitation, and Integrative Medicine, University of Texas MD Anderson Cancer Center, Houston, TX

BACKGROUND: Stereotactic breast biopsies (SBB) are associated with significant anxiety, and nonpharmacologic methods to manage acute anxiety are needed. Additionally, it is important to explore factors that determine who benefits most from such interventions. Spiritual wellbeing and religiosity have been positively correlated with greater mental health outcomes in medical populations. Thus, individuals low in spiritual wellbeing and/or religiosity may be ideal candidates for nonpharmacologic intervention during acute medical procedures. Our prior RCT found that guided meditation (GM) relative to focused breathing (FB) or standard care (SC) lead to steeper decline in anxiety levels across the course of SBB. Here we examined the moderating effect of spirituality and/or religiosity.
METHODS: This is a secondary analysis of an RCT examining the effect of GM (n=30), FB (n=30), or SC (n=16) on anxiety for women undergoing SBB. Anxiety (Visual Analogue Scale), spiritual wellbeing (FACIT-SP Meaning and Peace (M/P) and Faith (F) subscales), and religiosity (DUREL) were assessed at baseline, and anxiety was assessed every 4 min during SBB, and after SBB. EEG activity was collected throughout the study.
RESULTS: Multilevel modeling revealed a significant FACIT-SP M/P by group by time effect on anxiety during the procedure ($p = .001$). Specifically, women low in M/P who were assigned to GM or FB reported a steeper reduction in anxiety during biopsy compared to SC (p's $< .01$). Women high in M/P reported similar decline in anxiety ratings during the biopsy, regardless of group. The Faith subscale of the FACIT-SP and religiosity did not moderate the effect of group on anxiety during the biopsy. Spiritual wellbeing and religiosity did not moderate the effect of group on EEG activity during biopsy.
CONCLUSIONS: Women low in meaning and peace aspects of spiritual wellbeing derived greater benefit in terms of anxiety reduction from GM or FB compared to women high in spiritual wellbeing. Thus, brief nonpharmacologic interventions, such as GM or FB, may be ideal for individuals low in spiritual wellbeing seeking a nonpharmacological approach to manage their distress during biopsy.

Abstract 1668

LOOKING FOR SEMANTIC MEMORIES IN THE BRAIN OF TYPICAL AND ATYPICAL CHILDREN WITH MACHINE LEARNING

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Background

Long-term semantic memories of facts, locations, and events are one of the most important cognitive abilities that support the development and survival of humans. These memories are highly distributed across the brain. Previous research using functional magnetic resonance imaging (MRI) data of participants, who watched a movie, advanced our understanding of how semantic knowledge is represented in the adult brain (Nastase & Haxby, 2017). However, it did not examine how semantic knowledge develops in the growing brain of typical and atypical children. We hypothesize that semantic memories in children will be located in the same brain areas as in adults' brains, however, there will be a smaller region involved in children, since the knowledge is still under active development. Further, we hypothesize that even smaller areas will be involved in children with attention deficit hyperactivity disorder (ADHD), due to reduced attention during memory encoding.

Methods

To examine the hypothesis we will obtain an openly available dataset from Child Brain Network (Alexander et al., 2017). The dataset includes MRI (functional and anatomical) scans of 805 brains of participants 5 to 22 years of age. The dataset also includes age, sex, and diagnosis of every participant. The participants are ~40% females and ~50% were diagnosed with ADHD. During the fMRI scan, participants watched the same 10-minute clip from "Despicable Me". Every frame of the movie will be manually labelled as having a specific person, a scene, and objects. Based on previous research (Hanke et al., 2009), semantic labels extracted from the movie clip will be used to train a machine learning algorithm to associate them with activation of every voxel in the brain. Therefore, this analysis will produce whole-brain maps of the degree to which each voxel represents each label (person, object, etc.) from the movie clip. The maps will be evaluated for the spatial distribution of the semantic memories in a between-subject regression, looking for differences between groups, or relationships with age and sex, and their interactions.

Significance

The examination of the mechanisms of semantic knowledge will provide important insight into how memories are stored and how children with ADHD differ from typically developing children, while the plasticity of their brains allows effective clinical interventions.

Abstract 1728

DISTINCT BRAIN BASED CHRONIC PAIN SUBGROUPS ASSOCIATED WITH WIDESPREAD PAIN

Jennifer S. Labus, PhD, Medicine, UCLA, Long Beach, CA, Bruce Naliboff, PhD, Andrea S. Rapkin, MD, Emeran S. Mayer, MD,PHD, Medicine, UCLA, Los Angeles, CA

Background. There is a growing consensus that alterations of the central nervous system play an important role in the pathophysiology and symptom generation of chronic overlapping pain conditions and widespread pain. The aim of this study was to assign chronic pain patients into homogenous subgroups or clusters based on similar brain signatures, using a multivariate unsupervised learning segmentation method.

Methods. High resolution T1-weighted images were obtained in 242 participants with chronic pain, irritable bowel syndrome (IBS; 173 F), 18 interstitial cystisis (IC; 3 F), 13 chronic pelvic pain (CPP; 13 F), and 119 vulvodynia (VVD). All subjects completed the Patient Health Questionnaire-15, a continuous measure of widespread pain and the Hospital Anxiety and Depression scale. Freesurfer was used to parcel the brain into 165 brain regions using the Destrieux and Harvard-Oxford Subcortical atlases and to calculated regional volume, cortical thickness, surface area and mean curvature. To segment the brain data we applied ensemble clustering which uses a variety of algorithms and distance metrics.

Results. Partitioning around mediods using Manhattan distances proved to be the most robust clustering method. A two cluster solution showed high separation and compactness based on cluster quality indices (e.g., Calinski-Harabasz and Dunn's indices).

Cluster (C) 1 was comprised of 180 IBS, 3 IC, 6 CPP, and 76 VVD whereas as C2 had 62 IBS, 15 IC, 7 CPP, and 43 VVD. Compared to C2 (106 F, 21 M), patients in C1 (201 F, 64 M) tended to be younger ($p=.07$, mean difference (MD) = -1.9y), have greater degree of widespread pain ($p=.000006$, MD=2.3, $p_{\text{without IBS items}} = .000003$, MD=1.9), and higher state anxiety ($p=.06$, MD=.86). Compared to C2, patients in C1 had greater bilateral cerebellar cortex, brain stem, left thalamus and right amygdala volumes as well as greater surface are in the right orbital gyrus. Additionally, C1 compared to C2 had lower volume and surface area of the right rectus gyrus, as well as the right nucleus accumbens volume.

Conclusion. These findings suggest that brain morphometry can be used to identify distinct chronic pain subgroups, independent of disease classification, which differ by the degree of widespread pain and state anxiety. The findings support the idea of a distinct brain signature associated with widespread pain.

Abstract 1258

VENTROMEDIAL PREFRONTAL CORTEX CONNECTIVITY DURING AND AFTER PSYCHOLOGICAL STRESS

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The ventromedial prefrontal cortex (vmPFC) is purported to act as a hub brain system that interacts with other neural areas to construct affective meaning from contexts and to coordinate behavior with physiology, particularly during stressful experiences. Among 40 young adults, the present study evaluated 1) whether an anticipatory stress paradigm involving social evaluative threat altered circuit level function of the vmPFC during and after stressor exposure, 2) inter-individual covariation among measures of vmPFC connectivity, heart rate reactivity, and subjective reports of stress during and after stressor exposure, and 3) whether patterns of stressor-evoked or stressor-recovery vmPFC functional connectivity were associated with canonical (intrinsic) brain networks. Consistent with prior research, the stressor increased vmPFC functional connectivity with areas previously implicated in stressor processing (e.g., insula, amygdala, cingulate cortex) and decreased connectivity with the posterior cingulate cortex and thalamus. There were no statistical differences between pre- and post-stressor vmPFC connectivity, suggesting a return to baseline during recovery. Spatial similarity analyses revealed a stressor-evoked increase in vmPFC connectivity with components of the dorsal attention, ventral attention, and frontoparietal intrinsic networks, as well as decreased connectivity with the default mode network. During recovery, vmPFC connectivity increased with components of the frontoparietal network. At the network level of analyses, heart rate and perceived stress covaried across individuals with vmPFC connectivity to the ventral attention, frontoparietal, and default mode networks. Acute psychological stress appears to alter functional connectivity of the vmPFC in a manner that further relates to individual differences in stressor-evoked cardiovascular control and affective (self-report) responding.

Abstract 1607

BRAIN CORRELATES OF ANGINA DURING ACUTE MENTAL STRESS

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Background: Behavioral factors such as emotional stress have shown to be important correlates of angina symptoms. However, the brain mechanisms mediating such associations are unknown. We assessed the effects of acute mental stress on changes in brain activation in coronary artery disease (CAD) patients with and without angina.

Methods: CAD patients with (N=50) and without (N=100) angina symptoms in the previous 4 weeks based on the Seattle Angina Questionnaire's (SAQ) underwent positron emission tomography (PET) imaging of the brain with [O-15] water under mental stress and control conditions. Acute mental stress consisted of mental arithmetic and public speaking with matched control conditions (counting out loud, paragraph reading). PET scans were analyzed to determine the relationship between angina and brain activity under stress, which was measured by comparing stress with rest images. Both areas of activation (stress > rest) and deactivation (rest > stress) were assessed with statistical significance defined by $p<0.005$.

Results: Subjects with angina were younger (mean age 58 vs 64, $p<0.001$), had more symptoms of depression (BDI-II score 7 vs. 22, $p<0.001$) and post-traumatic stress disorder (PCL score 26 vs 45, $p<0.001$), were more often African-American (43% vs 25%; $p=0.001$) and on antidepressant medications (47% vs 31%; $p=0.04$) compared to those without angina, but CAD severity was not different ($p=0.42$). Subjects with angina displayed increased activation during mental stress in brain regions associated with interoceptive awareness (left anterior cingulate gyrus and left and right insula) and sympathetic nervous system regulation (left and right dorsolateral prefrontal cortex, inferior frontal gyrus, left anterior cingulate gyrus, and left and right insula). Subjects with angina also displayed decreased activation with stress in a parasympathetic-associated central autonomic network area (left middle temporal gyrus) (Table 1).

Conclusion: In patients with CAD, angina is associated with activation in brains areas involved in interoceptive awareness and autonomic processes. These findings are consistent with the existence of neurobiological pathways in angina symptoms.

VIEW PDF

New Developments in Intervention Research
Friday, March 8 from 3:00 to 4:00 pm

Abstract 1571

MECHANISMS OF CHANGE IN THERAPIST AND WEB DELIVERED COGNITIVE BEHAVIOURAL THERAPY (CBT) FOR IRRITABLE BOWEL SYNDROME (IBS): PROCESS ANALYSIS FROM THE ACTIB RANDOMISED CONTROLLED TRIAL (RCT).

Rona Moss-Morris, PhD, Psychology, Trudie Chalder, PhD, Psychological Medicine, King's College London, London, United Kingdom, Hazel Everitt, PhD, Primary Care, University of Southampton, London, United Kingdom, Kimberley Goldsmith, PhD, Department of Biostatistics and Health Informatics, King's College London, London, United Kingdom

The ACTIB RCT (n=558) showed that therapist delivered CBT (TCBT) and web-based CBT (WCBT) were significantly more effective than treatment as usual (TAU) at reducing IBS symptom seventy and impact at 12 months follow up. The aim of this study was to test theoretical underpinnings and proposed mechanisms of these CBT interventions by investigating whether predefined cognitive and behavioural (CB) mediators measured at the end of treatment predict primary outcome improvements at 12 months.

Methods: 3-arm RCT assessing TCBT, WCBT and TAU. Randomisation was conducted independently with concealed allocation. Assessors and statistician were blinded. Participants were adults with refractory IBS recruited from 74 general practices and 3 gastroenterology centres in England (May 2014-March 2016). Co-primary outcomes were Irritable Bowel Syndrome Symptom Severity Score (IBS SSS) and the Work and Social Adjustment Scale (WSAS) at 12 months. Putative mediators were Brief Illness Perception Questions (BIPQ negative and BIPQ control subscales), Cognitive Scale for Functional Bowel Disorders (CG-FBD), Irritable Bowel Syndrome-Behavioural Responses Questionnaire (BRQ avoidance and safety subscales), and Hospital Anxiety and Depression scale.

Data analysis: Separate structural equation models (SEM) were fitted for each mediator of interest using the measure of the mediator at end of treatment (3 month) and the 12-month follow-up measure of either IBS-SSS or WSAS as the outcome, with a dummy coded version of the three-level treatment group variable, baseline mediator and outcome and other potential confounders as independent variables.

Results: The effects of both therapies on both outcomes via the mediators were all significant, except for IPQ control for WSAS. Largest effects were for IPQ-N, BRQ-A and CG-FBD, with the latter being the strongest mediator. TCBT led to a 0.35 SD decrease in IBS-SSS via CG-FDB (95% CI -0.24 to -0.49, proportion mediated 50%) and WCBT a 0.33 SD decrease (95% CI -0.21 to -0.45, proportion mediated 75%). Similar effects were found for WSAS.

Discussion: Both TCBT and WCBT had a significant impact on the proposed CB mechanisms suggesting the treatments were effective through the proposed targets. Changing IBS specific cognitions and behaviours appeared to explain more of the variance in improvements than change in anxiety and depression.

Abstract 1593

EXPLORING FLOATATION-REST AS A NOVEL INTERVENTION FOR ANXIETY SENSITIVITY

Justin S. Feinstein, PhD, Sahib Khalsa, MD, PhD, Psychiatry, Laureate Institute for Brain Research, Tulsa, OK, Thomas Fine, MA, Psychiatry, University of Toledo, Toledo, OH, M.C. Flux, MA, Clinical Psychology, Christopher Lowry, PhD, Integrative Physiology, University of Colorado Boulder, Boulder, CO, Hung-wen Yeh, PhD, Psychiatry, Laureate Institute for Brain Research, Tulsa, OK, Obada Al Zoubi, MA, Computer and Electrical Engineering, University of Oklahoma, Tulsa, OK, Murray Stein, MD, MPH, Psychiatry, University of California San Diego, San Diego, CA, Martin Paulus, MD, Psychiatry, Laureate Institute for Brain Research, Tulsa, OK

Background: Floatation-REST (Reduced Environmental Stimulation Therapy), an intervention which attenuates exteroceptive sensory input to the nervous system, has recently been found to reduce state anxiety across a diverse clinical sample with high levels of anxiety sensitivity (Feinstein et al., 2018a; Feinstein et al., 2018b). To further examine this anxiolytic effect, the present study investigated the physiological changes induced by Floatation-REST and assessed whether individuals with high anxiety sensitivity experienced any alterations in their awareness for interoceptive sensation while immersed in an environment lacking exteroceptive sensation.

Methods: Thirty-seven participants with high anxiety sensitivity (Anxiety Sensitivity Index-3 total score ≥ 30) were recruited across a spectrum of anxiety and stress-related disorders (PTSD, generalized anxiety, social anxiety, and panic disorder). Each participant was randomly assigned to undergo a 90-minute session of Floatation-REST or an exteroceptive comparison condition, and then crossed over to the other condition following a 1-week washout period. Measures of self-reported affect and interoceptive awareness were

collected before and after each session, and electrocardiogram and blood pressure were collected during each session using wireless and waterproof sensors. All measures were analyzed by linear mixed-effects models.

Results: Relative to the comparison condition, Floatation-REST significantly enhanced awareness and attention for cardiorespiratory sensations ($p<.0001$). Physiological measures collected during the float session showed indications of a rapid relaxation response, including a significant reduction in blood pressure and a significant increase in normalized high-frequency heart rate variability ($p<.0001$ for both measures). The degree to which floating increased HRV was associated with the magnitude of the anxiolytic effect.

Conclusions: Floatation-REST induced a strong relaxation response consistent with increased parasympathetic outflow. At the same time, the float environment enhanced awareness for cardiorespiratory sensations in a clinical sample with high anxiety sensitivity. The unique juxtaposition between heightened interoceptive awareness in the context of a relaxed physiological background state may confer unique opportunities for the treatment of anxiety sensitivity.

Abstract 1702

EXPLORING THE IMMUNOLOGICAL EFFECTS OF FLOATATION-REST AND ITS INTERACTION WITH ANXIETY SENSITIVITY

M C. Flux, M.S., M.A., Clinical Psychology and Neuroscience, Jared D. Heinze, B.S., Christopher A. Lowry, Ph. D., Integrative Physiology, University of Colorado Boulder, Boulder, CO, Justin S. Feinstein, Ph. D., Float Clinic and Research Center, Laureate Institute for Brain Research, Tulsa, OK

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 the immunological changes induced by Floatation-REST and assessed whether anxiety sensitivity was related to these changes in response to immersion of the body in a solution of water saturated with 2000 pounds of magnesium sulfate.

Methods

Thirty-seven subjects with high anxiety sensitivity (Anxiety Sensitivity Index-3 total score $\geq$ 30) and 20 healthy controls were recruited. A randomly assigned cross-over design was used, including a 1-week washout period. The two conditions included a 90-minute session of Floatation-REST or an exteroceptive comparison condition. Blood samples were collected 1-hour before and 1-hour after each session. Thirty-three anxious subjects and 17 healthy controls successfully provided blood samples at all time points. Blood plasma was analyzed via multiplex enzyme-linked immunosorbent assay (ELISA) to simultaneously detect concentrations of 10 cytokines, of which interleukin (IL) 1 beta is reported presently. IL-1 beta concentration was modeled by linear mixed-effects models using fixed-effects of time, condition, ASI-3 score, and their interactions, and a subject-specific random intercept.

Results

There was a significant interaction between time, condition, and ASI-3 ($F_{(1,130.0)}=4.01$, $p=0.047$), such that in the floatation condition, subjects high in ASI-3 decreased in IL-1 beta at a faster rate (+1 SD slope= -0.59, $p<0.01$), than those with lower ASI-3 scores, who increased in IL-1 beta (-1 SD slope= 0.24, $p<0.01$). In the control condition, subjects decreased in IL-1 beta regardless of ASI-3 level, but at a slower rate than those with high ASI-3 scores in the floatation condition (-1 SD slope: -0.03, +1 SD slope: -0.18, $p<0.01$).

Conclusion

Floatation-REST induced time-based changes in IL-1 beta that were dependent on ASI-3 scores. Subjects with high anxiety sensitivity show the greatest reduction in IL-1 beta in the float condition. This pattern of change demonstrates the unique effects of Floatation-REST on immune functioning that may be contributing to its anxiolytic effects.

Abstract 1493

PSYCHOGENIC NONEPILEPTIC SEIZURES IN YOUTH: PSYCHOPHYSIOLOGY CHARACTERISTICS & BIOFEEDBACKTRAINING OUTCOMES

Tyson R. Sawchuk, Master of Science, Jeffrey Buchhalter, MD, PhD, Pediatric Neurosciences, Alberta Children's Hospital, Calgary, AB, Canada

Psychogenic non-epileptic seizures (PNES) are observable, abrupt changes in consciousness or behavior that present similar to seizures but are not accompanied by electrophysiological changes. These arise from a psychological etiology (categorized under Conversion Disorders) and comprise up to one quarter of referrals to pediatric epilepsy centers. Despite being a very common problem for epilepsy centers worldwide, very little is known about how best to manage PNES in children and youth. New studies describing autonomic nervous system (ANS) features of PNES have opened the way for development of potential diagnostic biomarkers and new treatment targets in adults with PNES. To date however, psychophysiology features have not been well described in children and youth with PNES.

Accordingly, we strove to determine autonomic characteristics of this population, based on psychophysiology assessment at time of diagnosis, including 1) ANS decompensation at baseline measurement 2) incidence of hyperventilation during standardized assessment and 3) whether children with PNES display suppression of normal autonomic stress response and/or 4) poor autonomic recovery from a cognitive stressor task. Finally, we sought to determine 5) whether PNES patients identified as having behavioral hypocapnia, could be successfully trained to correct carbon dioxide levels with the aid of biofeedback training.

A total of 16 patients, meeting criteria for clinically established PNES (as set out by ILAE criteria) were selected for study inclusion. Ages ranged from 10 to 17 years with the majority of patients being female (75%). Nijmegen data were available for 13 cases, with 77% having scores in the significant range for hyperventilation symptoms (mean score=25, SD=10). A diagnosis of behavioral hypocapnia, defined as ETCO2 values below 30mmHg in context of other clinical indicators (patient observations, subjective symptom report) was diagnosed in all but one case (94%). Baseline autonomic decompensation was observed in 81% of cases, usually characterized by abnormally high SCL mean (>5 µ Siemens) and/or low hand temperature (<90 degrees Fahrenheit). Suppression of the psychophysiology stress response (no observable change in SCL over 2-minute math task) was observed in only 3 out of 14 cases (21%). A total of 10 out of 15 patients did not recover SCL values back to baseline following administration of math stressor (67%). The vast majority of patients (87%) were taught to normalize their ETCO2 levels by the end of a single biofeedback training session, immediately following the assessment period (13 out of 15 patients).

In summary, we conclude that based on our small pilot study, child PNES populations can be characterized by psychophysiology markers including baseline ANS decompensation, hyperventilation upon provocation and poor recovery from cognitive stressor. We also conclude that hyperventilation behaviors can be effectively targeted for treatment, potentially resulting in positive outcomes for this difficult to treat population.

VIEW PDF

Pain
Friday, March 8 from 4:10 to 5:25 pm

Abstract 1123
IMPACT OF A COMPREHENSIVE LIFESTYLE INTERVENTION ON PAIN, DEPRESSED MOOD, STRESS, INFLAMMATION, AND TELOMERIC ACTIVITY FOR INDIVIDUALS WITH CHRONIC PAIN

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Background: Chronic pain is a debilitating and wide-reaching public health concern; however, existing treatments can have limited effectiveness and potential adverse effects. Lifestyle interventions may be an alternative treatment option for chronic pain, as they are typically designed to address complex conditions. The Complete Health Improvement Program (CHIP) is a 3-month lifestyle intervention that promotes a plant-based diet, exercise, and stress reduction. CHIP's multidimensional approach may be well-suited to address conditions like chronic pain; however, prior CHIP research has yet to include those with chronic pain, a comparison group, or psychosocial outcome measures. The current study accounted for these prior limitations, while assessing variables that span cellular aging (i.e., telomere length, telomerase), inflammation, depressed mood, perceived stress, and pain specific variables.

Methods: Individuals with physician-confirmed chronic pain lasting 6 months or longer (n=67, M_{age}=56.9, 71.6% female, 94% white) enrolled in either a CHIP (n=34) or treatment as usual (n=33) group. Baseline to 3-month follow-up measures included pain intensity, daily functioning, depressed mood, perceived stress, inflammation (plasma CRP), body mass index (BMI), and telomerase activity. Note that relative telomere length changes are currently being processed and will be included when presented.

Results: Groups did not differ at baseline with regard to age, sex, race, income, education level, or years with chronic pain (ps>.07). An intent-to-treat approach was taken for all analyses. CHIP participants significantly improved in depressed mood (t(61)=6.09, d=.58), perceived stress, (t(63)=3.99, d=.90), pain intensity (t(61)=5.10, d=.76), daily functioning(t(61)=5.58, d=.80), and BMI (t(62)=4.46, d=.87; all ps<.001) whereas participants who continued with their usual treatment did not (all ps>.30). There were no significant group differences in CRP or telomerase activity from baseline to follow-up (ps>.05).

Conclusion: Results suggest that lifestyle interventions that take a multidisciplinary approach to treating chronic conditions, may be well-suited to improve psychological and pain outcomes. Considering the improvement seen over multiple variables, a non-invasive lifestyle intervention may be a viable alternative treatment option for individuals with chronic pain.

Abstract 1383
THE EFFECTS OF A PAIN PSYCHOLOGY AND NEUROSCIENCE SELF-EVALUATION INTERVENTION: A RANDOMIZED CLINICAL TRIAL

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Background: Chronic musculoskeletal pain is driven primarily by centralized (brain) rather than peripheral processes (e.g., tissue damage). Trials of pain neuroscience education demonstrate shifts in beliefs but often no improvements in pain-related outcomes. We developed a novel, internet-based intervention in which patients explore psychological contributors to their pain. We tested whether the intervention was able to shift patients' attributions to a more centralized view of their pain, decrease pain-related fear, and improve pain outcomes.

Methods: Adults (n = 104) with chronic musculoskeletal pain were recruited from a university registry and randomized to Psychology/Neuroscience Pain Education (PNPE) or a control condition. PNPE consisted of a video about pain and the brain, followed by exercises to explore indices of centralized pain: pain distribution and overlapping centralized syndromes, pain catastrophizing and kinesiophobia, anxiety-related personality traits, stressors related to pain onset or exacerbation, and adverse childhood experiences. The control exercise was parallel in structure and explored health behaviors (e.g., nutrition, sleep). Attributions about pain and readiness for pain self-management were assessed at baseline, post-intervention, and 1-month follow-up. Pain severity and interference, anxiety, depression, and kinesiophobia were assessed at baseline and follow-up.

Results: ANCOVAs compared the two conditions, controlling for baseline scores and pain severity. At post-intervention and follow-up, compared to controls, PNPE had significantly greater beliefs that pain is controllable (d = .58), psychologically-related (d = .49) and brain-based (d = .81), and marginally greater readiness for self-management (p = .06, d = .38). At 1 month, PNPE had significantly lower pain severity (d = .45) and interference (d = .43), and marginally lower kinesiophobia (p = .08, d = .35) than controls, but no difference in anxiety or depression.

Conclusions: This online, self-guided, pain psychology and neuroscience education intervention shifts the beliefs of patients with chronic musculoskeletal pain toward viewing their pain as centralized and manageable, and reduces pain severity and interference 1 month later. Research should test the therapeutic power of interventions that help patients adopt a centralized model of chronic musculoskeletal pain.

Abstract 1678
IDENTIFY FUNCTIONAL AND ANATOMICAL REGIONAL BRAIN NETWORK PROPERTIES ARE ASSOCIATED WITH WIDESPREAD PAIN

Jennifer Labus, PhD, Ravi Bhatt, BS, Lisa Kilpatrick, PhD, Kirsten Tillisch, MD, Andrea S. Rapkin, MD, Bruce Naliboff, PhD, Emeran A. Mayer, MD,PHD, Medicine, UCLA, Los Angeles, CA

Background. The commonalities observed in the brain alterations across chronic pain conditions may relate to the development of widespread chronic pain. The aim of this study was to determine whether degree of widespread pain could be predicted from anatomical (fiber tracts) and functional (resting state connectivity) regional network properties.

Methods. High resolution T1-weighted, resting state and diffuse tensor imaging was obtained in 259 female patients (142 irritable bowel syndrome, 4 bladder pain syndrome, 113 Provoked vestibulodynia). Least Absolute Shrinkage and Selection Operator regression was applied to select the most important brain features for predicting widespread pain as measured by measured by the Patient Health Questionnaire-15, a continuous measure of widespread pain. In house workflows were used to compute the functional and anatomical strength, betweenness, eigenvector centrality, and clustering coefficient for 165 brain regions parceled in Freesurfer using the Destrieux and Harvard-Oxford Subcortical atlases.

Results. For fiber tracts, 26 of approximately 660 regional network properties tested explained 15.3% of variance in widespread pain and included sensory and motor (e.g., postcentral sulcus, visual processing, and inferior and superior temporal sulci and gyri associated with pain perception, bilateral caudate nucleus), salience, (e.g., anterior insula), emotional arousal and default mode network [DMN] (e.g., orbital frontal cortex, hippocampus, lateral temporal sulci, inferior frontal gyrus) regions.

For functional network properties, 34 of the 600 regional network properties explained 29.56% of the variance in widespread pain and included sensory (e.g., thalamus, posterior insula, post- and pre-central gyrus , basal ganglia, and multisensory convergence zones, superior temporal sulci), executive control regions (frontal and prefrontal gyri and sulci, uperior parietal lobule, as well as emotional arousal (orbital frontal gyri and sulci, DMN(posterior cingulate, angular gyrus, lateral temporal gyri) regions. (see **Figure 1**)

Conclusions. Multivariate brain signatures comprising functional and anatomical network metrics signatures predict widespread pain. As brain metrics were obtained in a cross sectional study, it remains to be determined if the observed changes are a consequence or a risk factor for chronic widespread.

VIEW PDF

Abstract 1734

CARE MANAGEMENT FOR THE EFFECTIVE USE OF OPIOIDS (CAMEO): A RANDOMIZED TRIAL

Matthew J. Bair, MD, Medicine, Samantha D. Outcalt, PhD, Psychiatry, James E. Slaven, MS, Biostatistics, Kurt Kroenke, MD, Medicine, Indiana University School of Medicine, Indianapolis, IN, Carol Kempf, RN, Research, VA Center for Health Information and Communication, Indianapolis, IN, Alan J. Zillich, PharmD, Pharmacy Practice, Purdue University, Indianapolis, IN, Teresa M. Damush, PhD, Medicine, Chandan Saha, PhD, Biostatistics, Indiana University School of Medicine, Indianapolis, IN, Dustin French, PhD, Ophthalmology, Northwestern University School of Medicine, Chicago, IL, Erin E. Krebs, MD, Medicine, University of Minnesota, Minneapolis, MN

The objective of the CAMEO Trial was to compare the effectiveness of pharmacological treatment and optimization vs. cognitive behavioral therapy for Veterans with chronic lower back pain on chronic opioid therapy.

CAMEO was designed as a 2-arm, randomized clinical trial. The study setting was 5 general medicine clinics at a Veteran Affairs Medical Center and 2 community based outpatient clinics. Participants included 261 Veterans with chronic low back pain of at least moderate intensity who were on chronic opioid therapy at baseline. Enrollment occurred from August 2011 to December 2014, with 12-month follow-up completed by December 2015.

The pharmacological (PHARM) arm involved nurse care management focused on analgesic treatment and optimization according to an algorithm. The behavioral (BEHAV) arm involved cognitive behavioral therapy delivered by clinical psychologists. The primary outcomes were pain impact, pain intensity, and pain interference as assessed by the Brief Pain Inventory (BPI).

131 participants in the PHARM arm and 130 participants in the BEHAV arm were included in the primary analysis. At 12 months, the adjusted mean decrease from baseline in the BPI total score (pain impact) was 0.64 points (Standard deviation [SD] = 0.22) in the BEHAV group and 1.14 points (SD = 0.23) in the PHARM group (between group difference of 0.5 points, p = 0.0423). Scores were adjusted for baseline BPI total score, depression (PHQ-9), and gender. At 12 months, BPI pain intensity decreased by 0.40 points in the BEHAV group (SD = 0.19) and 1.02 points (SD = 0.20) in the PHARM group (between group difference of 0.62, p = 0.0044). The mean decrease from baseline in the BPI interference score was 0.71 points in the BEHAV group and 1.19 points in the PHARM group (between group difference of 0.48 points; p = 0.0846).

In conclusion, a nurse care management intervention focused on pharmacological management reduced pain impact and intensity more than a behavioral intervention involving cognitive behavioral therapy.

Abstract 1612

THE ROLE OF AUTONOMIC DYSFUNCTION AND RESPONSES OF INFLAMMATION TO MOOD, PAIN, FATIGUE, AND AUTONOMIC FUNCTION IN FM AND ME/CFS

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Background Symptoms of dysautonomia and inflammation have been described in Fibromyalgia (FM) and Myalgic encephalomyelitis (ME)/Chronic Fatigue Syndrome (CFS). This ongoing study investigates, for the first time, how a sympathetically mediated challenge and induced systemic inflammatory state impact on mood, pain, fatigue, and autonomic function. **Methods** In a randomised, double-blind, placebo-controlled study, 15 participants with FM and/or ME/CFS underwent an autonomic- and inflammatory challenge during 3 visits. Outcome measures included a range of questionnaires, measures of heart rate (HR), Pressure Pain Threshold (PPT), alongside subjective pain and fatigue measures. Autonomic function was assessed using a passive non-invasive tilt-test (upright tilt of 60°) and active-stand (AS) with beat-to-beat HR and blood pressure monitoring. Remaining visits involved an inflammatory challenge using intramuscular typhoid- and saline (placebo) injection. **Results** Tilt-table test was positive in 50% participants and AS in all 15 participants indicated by HR rise >30 bpm and a sustained HR of 120 bpm. Fatigue Severity Scale scores were positively correlated with peak HR during AS (r=.649,p=.009, n=15). Profile of Mood States between tilt and AS correlated with HR change. Overall and physical fatigue correlated with HR change during AS (all=r>.517, p<.05, n=15). Only mental fatigue correlated with initial HR change after tilt (r=.732, p=.002, n=15). HR change at 1 min tilt correlated with Visual Analogue Scale pain scores pre-post-tilt (r=.636, p=.011, n=15). Overall fatigue change relative to baseline between typhoid and saline negatively correlated with HR change 1-6 min tilt (all= r>-.558, p<.05, n=10). PPT change pre-post-tilt positively correlated with HR change from tilt- 6 min (all=r<513, p>.05, n=15). PPT change under typhoid and saline correlated with HR change during 3 min tilt (r=-.689, p=.027, n=10). PPT change during tilt correlated with PPT change and overall fatigue after typhoid (all=r>.624, p<.05, n=13). **Conclusion** Preliminary findings suggest that dysautonomia and induced inflammation significantly impacts on pain, fatigue, and autonomic function in FM and ME/CFS. On-going data collection of 100 participants (25 controls) will allow extended analyses to test how autonomic function and inflammation affect symptom domains that impact on quality of life.

Prenatal Factors & Child Outcomes
Saturday, March 9 from 12:15 to 1:30 pm

Abstract 1672
PROSPECTIVE ASSOCIATIONS BETWEEN PRENATAL MATERNAL CORTISOL AND CHILD HEALTH

Hannah M. Schreier, PhD, Biobehavioral Health, The Pennsylvania State University, University Park, PA, Michael E. Roettger, PhD, School of Demography, The Australian National University, Canberra, Australia, Mark E. Feinberg, PhD, Damon E. Jones, PhD, The Bennett Pierce Prevention Center, The Pennsylvania State University, University Park, PA

Although maternal psychological stress during pregnancy has been linked to adverse consequences with respect to offspring health and development, few studies have prospectively assessed the link between maternal prenatal cortisol levels and later child health. As part of this study, we prospectively investigated the association between the maternal prenatal cortisol response to a salient interpersonal stressor and child health over the first three years of life.

Participants were 123 women expecting their first child who provided salivary cortisol samples at 12-32 weeks gestation (M=22.4 ± 4.9 weeks) following a videotaped couple conflict discussion with their partner. Mothers subsequently reported on overall child health and several indicators of child illness (sick doctor visits, fevers, ear and respiratory infections) when children were 6 months (n=114), 1 (n=116) and 3 (n=105) years old. Regression analyses were used to analyze associations between maternal prenatal cortisol reactivity and recovery and later infant/child health controlling for a number of covariates. The possible moderating role of maternal prenatal depressive symptoms was also investigated.

Results suggest that greater cortisol reactivity in response to the couple conflict discussion was associated with maternal report of better overall child health (p = 0.016, 95% CI = [0.06, 1.30]) across the study period. Greater cortisol reactivity was also associated with lower incidence rate ratios (IRRs) for maternal reports of sick doctor visits (IRR 95% CI = [0.25,0.83], p = 0.006), fevers (CI = [0.25, 0.73], p = 0.002), ear infections (CI = [0.25, 0.58], p < 0.001), and respiratory infections (CI = [0.08, 1.11], p = 0.073). Cortisol recovery was unrelated to study outcomes (all ps > 0.05). Maternal prenatal depression moderated the association between cortisol reactivity and overall child health (p < 0.034, 95% CI = [0.49, 1.14] for interaction term) but no other health outcomes (ps > 0.05).

This study provides important longitudinal evidence that greater maternal cortisol reactivity to a salient interpersonal stressor during pregnancy is associated with fewer child health problems and better maternal report of overall child health during infancy and into early childhood.

Abstract 1649
PRENATAL MATERNAL DHEA MODERATES ASSOCIATIONS BETWEEN PRENATAL CORTISOL AND INFANT TEMPERMAMENT

Laura Glynn, PhD, Psychology, Chapman University, Orange, CA, Mariann Howland, BA, Institute for Child Development, University of Minnesota, Minneapolis, MN

Background:
Maternal glucocorticoids (GCs; cortisol in humans) are widely hypothesized as primary effectors of fetal programming and a growing body of literature supports this premise. Recently it has been proposed, however, that a more informative index of maternal HPA-axis activity may be obtained through the concurrent consideration of cortisol and dehydroepiandrosterone (DHEA). There is coordinated synthesis and release of DHEA and cortisol, they exhibit opposing regulatory functions, and in non-human animal models DHEA exerts antagonistic effects on the actions of GCs in the CNS. The purpose of this study was to examine the co-action of prenatal cortisol and DHEA and infant temperament.
Methods:
116 women were recruited in early pregnancy. Hair samples were collected at 35 weeks' gestation (2cm closest to the scalp) and assayed for cortisol and DHEA. At 6 months, positive and negative infant temperament was assessed with behavioral coding of the lab-TAB puppet show and the still face paradigms. The joint effects of DHEA and cortisol were determined with complementary approaches: 1. Bivariate correlations between infant temperament, cortisol, DHEA and the cortisol to DHEA ratio were examined. 2. Regression models were constructed with cortisol, DHEA and the cortisol x DHEA interaction as predictors of the two temperament outcomes.
Results:
Although the correlational analyses between maternal cortisol, DHEA and infant temperament did not reach statistical significance (all p's > .17), cortisol/DHEA predicted positive affect (r = -.21; p < .05) and negative affect (r =.20; p < .05). Similarly, the regressions revealed statistically significant interactions between cortisol and DHEA for both positive and negative affect (both βs > .19; p's < .05). As shown in Figure 1, the associations between cortisol and infant temperament were only observed in the context of low levels of DHEA.
Conclusions:
Concurrent investigation of maternal prenatal cortisol and DHEA may prove illuminating – perhaps yielding additional information about net steroid activity shaping fetal development. Future research should examine the joint contributions of cortisol and DHEA in both typical developmental processes as well as their synergistic contributions to risk for psychopathology.

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Abstract 1517
EFFECTS OF A PRENATAL MINDFULNESS INTERVENTION ON INFANT STRESS PHYSIOLOGY AND BEHAVIORAL REGULATION IN A LOW-INCOME, MULTI-ETHNIC, HIGH-STRESS SAMPLE

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Background: Developmental Origins of Health and Disease (DOHaD) research has revealed that maternal prenatal stress can adversely affect the developing fetus in ways that can influence its health in infancy and beyond. We previously demonstrated in the MAMAS study that a mindfulness-based stress-reduction intervention during pregnancy was associated with decreases in perceived stress and symptoms of depression, and these effects were maintained postpartum (Epel et al., under review; Felder, et al., 2018). We sought to determine whether the intervention might also relate to variations in offspring stress physiology and behavioral regulation, via prenatal programming effects of the reductions in maternal distress.
Methods: In a low-income, ethnically-diverse, sample of 215 highly-stressed, overweight pregnant women, women were enrolled in either an 8-week group-based mindfulness intervention (MIND) or a treatment-as-usual (TAU) control group. Groups did not differ on baseline factors, other than gestational age (GA) at baseline. 153

maternal-infant dyads were successfully followed through 6 months postpartum, when they completed a 10-minute gold-standard stressor paradigm (Still Face). Infant sympathetic nervous system reactivity (pre-ejection period: PEP) and behavioral negativity and regulation (objective second-by-second coding) during typical play, the stressor, and the reunion/recovery period was assessed.
Results: Mixed model analysis of repeated measures revealed that babies born to women in the MIND intervention demonstrated greater sympathetic reactivity to the stressor (PEP change= -1.2, p=.02), whereas control group babies did not react to the stressor but were reactive during the recovery period (PEP change= -1.1, p=.05) (See Figure 1). MIND babies also demonstrated significantly lower negative behavior (23% vs. 33% of task time; p=.02) and 16% more self-regulatory behavior (48% vs. 32% of task time; p<.001) across the Still Face paradigm. Models adjusted for baseline GA.
Conclusions: The prenatal MIND intervention appears to contribute to improved responses to social stress in offspring, reflected in both sympathetic nervous system and behavioral reactivity and regulation, factors that relate to later health. Potentially negative effects of prenatal maternal stress on offspring may be mitigated by psychosocial interventions during pregnancy.

VIEW PDF

Abstract 1226
MATERNAL MINDFUL DISPOSITION, PERCEIVED STRESS, ALPHA AMYLASE, AND CORTISOL: A LONGITUDINAL ANALYSIS ON MATERNAL AND INFANT STRESS RESPONSE
Olivia Silke, B.A., Guido Urizar, Ph.D., Psychology, California State University, Long Beach, Long Beach, CA
Background: Prenatal stress has been associated with poor maternal and infant health; therefore, investigating protective factors during pregnancy may contribute to reductions in adverse health outcomes for this population. Mindful disposition refers to one's ability to maintain "present-moment-awareness" and has been studied as a protective factor to the negative effects of prenatal stress. The present study hypothesized: (1) that pregnant women high in mindful disposition would have lower stress levels from pregnancy to postpartum compared to women low in mindful disposition; and (2) infants of mothers high in mindful disposition would demonstrate decreased stress levels and that this relationship would be strengthened by lower maternal stress levels. **Design:** The study sample consisted of 100 low-income pregnant women who were identified as being high or low in mindful disposition at baseline using a median split of Mindful Attention Awareness Scale scores. Maternal stress levels (perceived stress, alpha amylase, and cortisol) were assessed at four time points (baseline, second trimester, third trimester, and 3-months postpartum); infant stress levels (stress as perceived by their mother, alpha amylase, and cortisol) were assessed at 3-months postpartum. **Results:** Repeated measures analyses revealed that women high in mindful disposition had lower levels of perceived stress across pregnancy and at postpartum, $F(3, 240) = 4.43$, $p = .04$, $?_p^2 = .05$. Conversely, there was no significant difference between women who were high or low in mindful disposition on maternal biological stress levels (alpha amylase, cortisol). Furthermore, multiple linear regression analyses indicated that neither maternal mindful disposition nor maternal stress were associated with infant stress levels. **Conclusion:** This research contributes to a greater understanding of how mindful disposition may contribute to positive health outcomes associated with perceived stress for pre- and postnatal women.

Abstract 1047
SYSTEMATIC REVIEW AND META-ANALYSIS OF ASSOCIATIONS BETWEEN PREGNANCY-RELATED ANXIETY AND CHILD DEVELOPMENT
Stephana J. Cherak, MSc, Community Health Sciences, Jenna C. Thomas, PhD, Psychology, Tyler Williamson, PhD, Gerald F. Giesbrecht, PhD, Community Health Sciences, University of Calgary, Calgary, AB, Canada
Background
Anxiety during pregnancy is common and a serious health concern. Pregnant women experience the same variety of anxiety symptoms and disorders that are present in non-pregnant women (e.g., generalized anxiety, social anxiety), but they may also experience pregnancy-related anxiety (PrA), which is characterized by pregnancy specific fears and worries. Considerable evidence suggests that PrA is more strongly related to maternal and child outcomes than are general anxiety and depression, suggesting that PrA constitutes a useful clinical construct. We undertook a systematic review and meta-analysis of studies linking PrA to child outcomes to distill and clarify extant findings in this growing body of literature.
Methods
Relevant studies published up until May 2018 were identified through database searches in MEDLINE, CINAHL, EMBASE, and PsycINFO. We included data from human observational studies that were designed or had an underlying intention to measure PrA using an instrument specific to PrA and any child development outcome. Owing to heterogeneity of child development outcomes and a wide variety of measurement scales and subscales used, a meta-analysis was performed only for temperamental negative affectivity.
Results
12 studies were identified for inclusion in the qualitative review after applying inclusion/exclusion criteria. The studies were grouped according to the following child development outcomes: behavior, motor, neurocognitive, and temperament. 3 studies provided suitable data for meta-analysis of negative affectivity subscales in the quantitative synthesis, which showed a positive association between PrA and child temperamental negative affectivity, with negligible between-study heterogeneity ($r = 0.27$, 95% CI 0.19 to 0.34, $p<0.001$, $I^2= 0.0\%$).
Conclusions
Strong evidence exists for the relation between PrA and child development. Quantitatively, PrA significantly associated with increased child temperamental negative affectivity. Careful consideration must be given to the research question being addressed before deciding on which PrA specific tool to use; suggestions are specified. Several recommendations for development of a theoretically ground and thorough psychometric scale to enable greater comparability across studies investigating long-term developmental programming consequences of pregnancy-specific stress are discussed.

Abstract 1765
THE IMPACT OF PRENATAL MATERNAL STRESS ON REGULATION DEVELOPMENT: A FOLLOW UP OF THE 2009 RED RIVER FLOOD STUDY
Angela G. Bagne, M.S., Clayton Hilmert, Ph.D., Psychology, North Dakota State University, Fargo, ND
Research indicates that prenatal maternal stress (PNMS) can affect fetal development through a variety of potential neurological and metabolic pathways. Birth outcomes following PNMS may include low birth weight and preterm births. More recent research has found that the effects of PNMS extends beyond pregnancy and birth outcomes, associating PNMS with a host of adverse consequences across child developmental domains. Previous studies have shown that PNMS is related to eating attitudes and emotion regulation. In this study we followed up with participants in the 2009 Red River Valley Flood & Pregnancy Study to examine if mothers' experience of the historical flood in Fargo, ND nine years ago was associated

with developmental outcomes in their now 8-year old children. A total of 61 previous participants completed questionnaires and supplied hair samples from their children (33 males, 28 females) for hormone analyses (not reported here). Participants varied in how close they lived to flooding areas in 2009 and in gestational age at the time of the flood crest. Analyses showed that these variables were related to children's attitudes about food and emotion regulation. Specifically, children of mothers who reported being closer to flooding had higher scores on the Eating Attitudes Test ($r=-30$, $p<.10$) indicating more disordered eating attitudes. Regression analyses suggested that this association was mediated by birth weight. That is, being closer to flooding was associated with lower birth weight (Hilmert et al., 2016) and, lower birthweight was associated with more disordered eating attitudes. Also, women who experienced the flood earlier in pregnancy tended to have children who scored lower on the cognitive reappraisal subscale ($r=.36$, $p<.01$) and higher on the suppression subscale ($r=-.31$, $p<.05$) of the Emotion Regulation Questionnaire. These latter findings are consistent with research showing that the experience of stress earlier in pregnancy has a greater impact on the pregnancy outcomes, including birth weight. However, birth weight was not associated with the emotion regulation results. Overall, these results suggest that whether working through important pregnancy outcomes, like birth weight, or by other means, PNMS influences regulatory capacities in offspring.

Sex Differences in Heart Disease
Thursday, March 7 from 1:15 to 2:15 pm

Abstract 1115
HIGHER PLASMA LEVELS OF CT-PROAVP ARE LINKED TO LESS ANXIETY IN MEN BUT NOT WOMEN WITH CARDIOVASCULAR RISK FACTORS. RESULTS FROM THE OBSERVATIONAL DIAST-CHF STUDY

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Aim: Using data from the multicenter, observational Diast-CHF (Diagnostic Trial on Prevalence and Clinical Course of Diastolic Dysfunction and Heart Failure) study, this post-hoc analysis aimed at assessing the association between serum concentrations of C-terminal pro-arginine-vasopressin (CT-proAVP) and anxiety in patients with cardiovascular risk factors.
Background: Animal studies have demonstrated that centrally released AVP is involved in the development of anxiety-like behaviors, however, it is unknown whether, also in humans, CT-proAVP used as a proxy for the co-secreted AVP is associated with self-reported anxiety.
Methods: In 1,463 study participants with cardiovascular risk factors (mean age 66.7 ± 8.1 years, 51.3% males, mean left ventricular ejection fraction 59.8 ± 8.3%), serum concentrations of CT-proAVP were measured by means of an ELISA assay, and anxiety was assessed using the Hospital Anxiety and Depression Scale (HADS).
Results: Data showed that there was a significant and inverse correlation between HADS anxiety and CT-proAVP (rho=-0.074; p=0.005). Serum CT-proAVP and the HADS anxiety differed between the two gender: men displayed lower anxiety (4.7±3.5 versus 5.5±3.7) and had higher CT-proAVP levels (5.8 pmol/L, interquartile range 3.5-9.9 pmol/L versus 3.0 pmol/L, interquartile range 2.0-4.7) than women (both, p<0.001). In a regression model adjusted for age, body-mass index, estimated glomerular filtration rate, left ventricular ejection fraction, 6-minute walking distance, SF-36 physical functioning, and the natriuretic peptides NTpro-BNP and MR-proANP, the interaction term sex*CT-proAVP was inversely and significantly associated with anxiety only in men (B=-0.991; 95%CI=-1.650--0.331; p=0.003), but not in women (p=0.335). **Conclusion:** In male study participants with cardiovascular risk factors, serum concentrations of CT-proAVP showed an inverse association with anxiety, which was independent from the severity of physical impairment.
Key words: CT-proAVP, vasopressin, anxiety, cardiovascular risk factors

Abstract 1470
GENDERED ASSOCIATIONS OF DEPRESSIVE SYMPTOMS AND ANXIETY WITH INFLAMMATORY BIOMARKERS IN PATIENTS WITH NON-OBSTRUCTIVE CORONARY ARTERY DISEASE: ROLE OF LIFESTYLE FACTORS.

Paula M.C. Mommersteeg, PhD, Medical and Clinical Psychology, Tilburg University, Tilburg, Netherlands, Petrus J.W. Naudé, PhD, Department of Molecular Neurobiology, University of Groningen, Groningen, Netherlands, Jos Widdershoven, MD, PhD, Department of cardiology, Elisabeth-Tweesteden Hospital, Tilburg, Netherlands, Regien G. Schoemaker, PhD, Department of Molecular Neurobiology, University of Groningen, Groningen, Netherlands

Background: Inflammatory biomarkers have been proposed as mechanisms relating psychological complaints to cardiac disease progression. Gender differences may reflect the association of inflammatory biomarkers with psychological complaints. Women report more depressive symptoms and anxiety than men, and non-obstructive coronary artery disease (NOCAD) is more prevalent in women. The aim of this study was to examine gender-stratified associations of inflammatory biomarkers with depressive symptoms and anxiety in patients with NOCAD.
Methods: Depressive symptoms and anxiety (Beck Depression Inventory and Hospital Anxiety and Depression Scale) were examined as part of the the TweeSteden Mild Stenosis (TWIST) observational cohort study in 524 patients with NOCAD (52% women, mean age 64 ± 9 years). Blood samples were analyzed for neutrophil gelatinase-associated lipocalin (NGAL) levels, high-sensitive C-reactive protein (hsCRP), and leukocyte differentiation (number of leukocytes, lymphocytes, monocytes, and granulocytes). Gender differences, and gender-stratified associations of the inflammatory biomarkers with depression and anxiety were observed, unadjusted, and adjusted for sociodemographic, disease severity, and lifestyle covariates.
Results: Women showed elevated hsCRP and lower monocyte count compared to men. In women, modest positive associations were observed between depressive symptoms and leukocyte, lymphocyte, monocyte, and granulocyte count, but not with anxiety, or hsCRP levels. In men, age adjusted models showed modest positive associations with depressive symptoms or anxiety with NGAL, hsCRP, and granulocytes count. Sociodemographic and lifestyle adjustment rendered all findings nonsignificant. Smoking was consistently and positively associated with the inflammatory variables, and smoking was more prevalent in depression and anxiety. No consistent significant sex by inflammatory biomarker by depression/anxiety interactions were observed.

Conclusion: In patients with NOCAD small unadjusted associations between inflammatory biomarkers and depressive symptoms and anxiety suggest gendered associations for leukocyte subsets in women, and NGAL and hsCRP in men. Smoking was associated with elevated inflammatory biomarkers, but the role of gender, smoking, and psychological factors on inflammatory biomarkers remains to be examined in larger scale cohorts.

Abstract 1150

WOMEN ARE AFFECTED MOST BY THE EFFECT OF CHRONIC STRESS ON THE COURSE OF FATIGUE AFTER A CARDIAC EVENT, THE THORESCI STUDY

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Background: Fatigue is a prevalent and persistent symptom in patients with coronary artery disease (CAD). Individual differences in chronic stress, as well as patient sex may affect the experience and persistence of fatigue. Therefore, we studied the effect of chronic stress on the course of fatigue over a period of 2 years, and the moderating effects of sex.

Method: 669 CAD patients (79% men, age = 66.0 (SD=10.6)), who were recruited for the THORESCI study, filled out multiple self-report questionnaires at baseline, one month, 12 months and 24 months after undergoing percutaneous coronary intervention. The questionnaires assessed demographics, fatigue (HCS) and multiple chronic stressors i.e. work stress (short-ERI), marital stress (MMQ-6), early life events (Life Events Questionnaire) and social stress (living alone and lacking a confidant). Clinical information was obtained from patients medical records. Clustered exploratory factor analysis (LatentGOLD) was used to construct a comprehensive chronic stress index. Linear mixed modeling was then used to examine the predictive value of this chronic stress index for the course of fatigue, as well as examining the moderating effect of sex

Results: Linear Mixed Modelling showed that chronic stress significantly affected the 2-year course of fatigue, with fatigue being persistently higher due to chronic stress, independent of the effects of medical history, age, and sefx ($p<.001$). We found a significant interaction effect between sex and chronic stress ($p=.036$). I.e. after one month fatigue stabilized for men, while it kept increasing for women over the remainder of the 2-year follow-up.

Conclusions: This study showed that patients with CAD with chronic stress are more likely to report fatigue symptoms, even 24 months after percutaneous coronary intervention. Women with chronic stress proved especially vulnerable. Findings indicate that especially in women comprehensive assessment of chronic stress is warranted and should be taken into account when explaining fatigue in patients with coronary artery disease.

Abstract 1210

SEX AND GENDER-STRATIFIED RISKS OF PSYCHOLOGICAL FACTORS FOR INCIDENT ISCHEMIC HEART DISEASE AND PROGNOSIS: A META-ANALYSIS IN 2,373,326 WOMEN AND 3,441,773 MEN.

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Background: Depression and anxiety are related to a higher risk of IHD incidence and progression. However, it is unknown if these factors, which are also more common in women than men, pose a disproportionate increased risk for women compared to men. We assessed sex and gender (S&G)-related risks of psychological factors for the development (incidence) and progression (prognosis) of IHD in a meta-analysis.

Methods: Literature searches were conducted using PubMed, EMBASE, and PsycINFO. Studies examining depression, anxiety, social support, anger/hostility, personality, post-traumatic stress disorder, and psychological distress for the incidence or prognosis of IHD were included. Screening and data-extraction were performed in duplicate. Authors were asked to provide S&G-stratified data, when not present in the article. Random-effect analyses were performed using Comprehensive Meta-Analysis.

Results: We included 290 papers regarding IHD incidence or prognosis, of which 64% did not report S&G-stratified results. After contacting 187 authors, 68 (36%) provided S&G-stratified results. Depression was the most examined psychological factor. In total, 297 effects were included, either adjusted for covariates and unadjusted. Primary analyses included 2,373,326 women and 3,441,773 men. Adjusted pooled effect estimates showed that psychological factors were associated with incident IHD in both women (HR=1.21, 95%CI 1.14-1.29) and men (HR=1.25, 95%CI 1.19-1.31), and with adverse prognosis (clinical outcomes) after IHD in women (HR=1.21, 95%CI 1.13-1.30) and men (HR=1.37, 95%CI 1.27-1.48). To explain the heterogeneity in the included effects, subgroup analyses showed that e.g. age, sample size, follow-up time, and type of IHD moderated the overall effect size estimates.

Conclusions: Our findings do not suggest a higher risk for women with psychological factors and incident IHD than men. Regarding adverse outcomes in individuals with IHD, a stronger association was found for men. However, most papers do not report S&G-stratified findings. Moreover, studies comprise more male than female participants, and mainly focus on the clinical consequences of obstructive coronary artery disease, which is more common in men than women. More S&G-stratified data are needed, especially on psychological predictors of IHD that are more prevalent among women, such as microvascular disease.

Sleep

Thursday, March 7 from 3:55 to 5:25 pm

Abstract 1436

LONG-TERM SLEEP DISRUPTION FOLLOWING HEMATOPOIETIC STEM CELL TRANSPLANTATION: PREVALENCE AND BIOBEHAVIORAL PREDICTORS

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Sleep disruption is a commonly reported quality of life concern after hematopoietic stem cell transplant (HSCT). We previously found that 69% of HSCT patients experience clinically significant sleep disruption acutely, with 53% continuing to have impaired sleep 6 months post-HSCT. The present study evaluated whether sleep disruption persists at 1 and 3 years post-HSCT. We also investigated whether disease and treatment factors, psychological symptoms, and inflammation during the peri-transplant period predicted later problems with sleep disturbance and duration. Participants were 364 HSCT recipients who completed measures of sleep (PSQI), depression and anxiety (IDAS) pre-HSCT, 3 months, and 1 and 3 years post-HSCT. A subset (n=128) provided blood samples pre- and 3 months post-HSCT for determination of cytokine levels (IL-6, TNFα, IL-10). Linear regression models covarying for transplant type (autologous or allogeneic), age, and baseline sleep indices evaluated relationships between psychological symptoms or cytokines pre- and

3 months post-HSCT and key sleep indices 1 and 3 years post-HSCT: global score, nighttime disturbance, and sleep duration. Results showed that 48% and 52% of participants reported clinically significant sleep disruption 1 and 3 years post-HSCT, respectively. The most common problems were difficulty falling and staying asleep and sleep-related daytime dysfunction. Anxiety pre-HSCT and depression 3 months post-HSCT predicted poorer global sleep at 1 year (β=.56, .51; p<.05). Depression and anxiety at both peri-transplant points predicted greater nighttime disturbance at 1 year (β=.07-.09; p<.05). Similarly, depression and anxiety 3 months post-HSCT predicted greater nighttime disturbance at 3 years (β=.14, .12; p<.05). Higher circulating IL-6 and IL-10 pre-HSCT predicted shorter sleep duration at 1 and 3 years, respectively (β=.19, .21; p<.05). Diagnosis and transplant type were not associated with sleep outcomes. The findings indicate that sleep disruption persists through 3 years post-HSCT, with no improvement beyond 6 months post-HSCT. Psychological symptoms appear to be risk factors for later sleep disturbance, while inflammatory biomarkers predicted short sleep duration. Depression and anxiety during the peri-transplant period appear to be more sensitive predictors of long-term sleep problems than are disease or treatment factors.

Abstract 1342

POOR SLEEP QUALITY IS ASSOCIATED WITH FAILURE TO SUPPRESS THE DEFAULT MODE NETWORK UNDER HIGH WORKING MEMORY DEMANDS IN OEF/OIF/OND VETERANS WITH A HISTORY OF MILD TRAUMATIC BRAIN INJURY

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Background: Repeated blast-related mild traumatic brain injury (mTBI) is common among Veterans deployed during Iraq and Afghanistan war conflicts. Many of these Veterans report persisting cognitive difficulties years post-injury. However, objective evidence of cognitive deficits remains equivocal, and research to date has largely focused on the contribution of neurological and psychological factors. One additional factor that warrants consideration is sleep quality, especially given the high prevalence of sleep difficulties following mTBI and the known detrimental effects of poor sleep on cognitive functioning. **Methods**: Participants included 43 predominantly Caucasian OEF/OIF/OND Veterans aged 22-54 (mean age 35.6) with a history of mTBI. Participants completed the N-Back, a visual working memory task, during fMRI. Participants also completed self-report measures of sleep quality (Pittsburgh Sleep Quality Index; PSQI) and PTSD symptoms (PTSD Checklist – Military Version; PCL-M). Analyses were conducted using FLAME, a mixed effects model, in FSL. Correlations were conducted for PSQI, with age and PTSD symptoms (PCL-M minus sleep item) entered as covariates. **Results**: Veterans with a history of mTBI demonstrated robust working memory network activation when performing the 3-back relative to the 0-back task. The group activation map is shown in Figure A; the group map (shown in blue) is also included in panels B and C to show the location of the correlation clusters relative to the working memory network. Poor sleep quality was associated with abnormal involvement of the default mode network (medial prefrontal cortex) (Figure B) and increased activation of other brain regions including the caudate and the subcallosal cortex (Figure C). **Conclusions**: These results suggest that poor sleep quality in Veterans with a history of mTBI is associated with altered patterns of brain activation during working memory, which may explain some of the reports of day-to-day cognitive difficulties. Specifically, failure to suppress the default mode network under heightened cognitive challenge may indicate inefficient cognitive control processes and partially explain subjective cognitive complaints. In turn, increased recruitment of other brain regions may suggest compensatory activation, which could explain the lack of objective evidence of cognitive deficits in this population.

VIEW PDF

Abstract 1236

CARDIOMETABOLIC AND SLEEP PATHWAYS TO COGNITIVE FUNCTIONING AT MIDLIFE

Lauren N. Whitehurst, PhD, Psychiatry, University of California, San Francisco, San Francisco, CA, Andrew Smolen, PhD, Luke M. Evans, PhD, John C. De Fries, PhD, John K. Hewitt, PhD, Sally J. Wadsworth, PhD, Institute for Behavioral Genetics, University of Colorado, Boulder, Boulder, CO, Chandra A. Reynolds, PhD, Psychology, University of California, Riverside, Riverside, CA

Cardiometabolic risk is important in the etiology of cognitive decline as we age, especially in the development of Alzheimer's disease (AD), with hypercholesterolemia related to higher incidence of cognitive decline and AD (Sananayagam & Shankar, 2012). Sleep may be an important factor connecting cardiometabolic risk to cognitive functioning as sleep disruptions have been tied to poor cardiovascular health and the Apolipoprotein E (APOE) e4 allele, the most well-established genetic risk factor for AD, has been associated with sleep disruption (Cosentino et al., 2008). Unfortunately, most studies have focused on late life adults, a time after interventions are likely to curb risk. Here, we examined whether APOE status, sleep quality, and lipoproteins predict cognition in a sample of young to mid-life adults.

WAIS-III Verbal, Performance, and Full Scale IQ, sleep, and lipid profiles were assessed in 702 adults from young adulthood to midlife (*age*=28–47; *M*=33) in the ongoing CATSLife study with participants enrolled from two prospective cohort studies of cognition and behavioral development (i.e. the Colorado Adoption Project and the Longitudinal Twin Study). Serum lipids and lipoproteins, including LDL, HDL, total cholesterol and triglycerides were collected with self-reported sleep quality via the Pittsburgh Sleep Quality Index. APOE genotypes were coded into the number of e2 and e4 alleles, respectively.

Using linear mixed models, we found that higher triglycerides (p=0.02) and worse sleep quality (p=.04) predicted poorer Full Scale IQ performance. However, subscales presented a differentiated picture. Poorer sleep quality was associated with worse Verbal (p=0.04), but not Performance (p=0.13) IQ. On the other hand, triglycerides (p=0.006) and HDL (p=0.05) emerged as predictors for Performance IQ, with triglycerides predicting worse performance and higher HDL associated with better performance, but neither were significantly related to the Verbal scale (p's > 0.10). Neither APOE e4 status, total cholesterol, nor LDL predicted cognitive outcomes in fully adjusted models, though effects were in the expected direction.

Expanding on previous research, these data suggest that both cardiometabolic and sleep profiles may represent partly independent pathways to cognitive impairment and examining them early in life may help curb risk for later cognitive decline.

Abstract 1120

PSYCHOLOGICAL AND HEALTH CORRELATES OF NIGHT-TO-NIGHT VARIABILITY IN SLEEP IN NURSES

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Impaired sleep is robustly associated with increased risk for morbidity and mortality. Yet most previous work has examined

average or retrospective sleep and not taken into consideration night-to-night variability in sleep assessed prospectively across time (i.e., intraindividual variability [IIV]). Recent studies have shown that greater IIV in sleep is related to poorer physical and mental health, greater stress, and higher levels of inflammation, even controlling for average sleep. In this study, we examined if IIV in sleep over 14 days was associated with medical conditions, stress, substance use, and inflammatory markers CRP, IL-6, IL-1β, and TNF-α in nurses (who tend to experience high variability in sleep due to stressful work environments and rotating schedules). Participants were 400 nurses (92% female; 78% white, mean age = 39.51 ± 11.13 years) recruited for a larger study. Participants completed baseline measures of health, serum samples to assess inflammation, and 14 days of sleep diaries to assess total sleep time (TST; hours) and sleep efficiency (SE; %). Lower intraindividual mean (IIM) TST was associated with more medical conditions and higher IL-6, and lower IIM SE was associated with more caffeine use, more perceived stress, and higher IL-6. Greater IIV in TST was associated with greater perceived stress (β = 1.14, p = .02), lower caffeine use (β = -.27, p = .003), lower TNF- α (β = -.10, p = .03), as well as a marginally greater number of medical conditions and marginally higher IL-6, but was not associated with alcohol use, CRP, or IL-1β. Greater IIV in SE only was associated with lower caffeine use (β = -6.92, p = .0003). (Results will be confirmed with forthcoming additional inflammation data and actigraphy data presented at the conference.) Results suggest that lower mean TST and SE, as well as greater night-to-night variability in TST and SE, are associated with poorer health in nurses, but inconsistently associated with markers of inflammation. Experimental work will clarify the directionality of these relationships, but it is possible that those who are unable to maintain consistent sleep schedules may experience circadian disruptions in immune, neuroendocrine, or metabolic activity. Given that nurses are the first-line of care in hospitals, it is essential to address their sleep problems proactively to improve health and well-being.

Abstract 1441

ASSOCIATION OF NON-RESTORATIVE SLEEP WITH SUBJECTIVE SENSITIVITY TO ENVIRONMENTAL NOISE

Daniel Fong, PhD, Sha Li, PhD Candidate, Janet Wong, PhD, School of Nursing, Bradley McPherson, PhD, Faculty of Education (Division of Speech and Hearing Sciences), The University of Hong Kong, Hong Kong, Hong Kong, Esther Lau, PhD, Psychology, The Education University of Hong Kong, Hong Kong, Hong Kong, Lixi Huang, PhD, Mechanical Engineering, Mary Ip, MBBS, Medicine, The University of Hong Kong, Hong Kong, Hong Kong

Background: Non-restorative sleep (NRS) has received increasing attention as a target for treatment. Environmental noise exposure may be an extrinsic factor of NRS. A common noise-induced hearing symptom in both adults and adolescents is sound sensitivity or hyperacusis. A few studies examined the association between noise sensitivity and NRS, but they did not assess NRS by NRS-specific tool and were laboratory studies with limited generalizability. Therefore, we aim to assess the association between NRS and noise sensitivity in a community-based study with appropriate assessment of NRS and noise sensitivity.

Methods: This is a household survey of Chinese adults in Hong Kong. They completed our validated Chinese versions of the Non-restorative Sleep Scale (NRSS) and Weinstein Noise Sensitivity Scale (WNSS), both standardized on the 0-100 scale. A high WNSS score indicates high noise sensitivity and a high NRSS score indicates less NRS. They also had nocturnal noise exposure measured and wrist-worn actigraph for a week.

Results: Eighty-six subjects (55% female) consented to participate in the study whose average age was 39.8 years (range: 23-64). Twenty-nine completed the nocturnal assessment of noise and sleep quality while others are pending for assessment. Their mean NRSS score was 64.7 (95% CI: 60.5 to 68.9) and mean WNSS score was 62.8 (95% CI: 58.3 to 67.4). The mean nocturnal noise level was 56.1 dBA (95% CI: 54.4 to 57.8). The average sleep latency was 5.3 (95% CI: 3.5 to 7.1) mins; average sleep efficiency was 78.4% (95% CI: 75.3% to 81.5%), total sleep time was 5.5 (95% CI: 5.1 to 5.9) hours, average wake after sleep onset was 86.0 mins (95% CI: 71.7 to 100.2), average number of awakenings was 26.0 (95% CI: 22.1 to 30.0), and the average length of awakening was 4.0 mins (95% CI: 2.7 to 5.2). After adjusting for age, gender, nocturnal noise exposure, one unit increase in WNSS was significantly associated with a reduction of NRSS score by 0.5 (95% CI: 0.1 to 0.8).

Conclusions: People who are more sensitive to noise would suffer more NRS. People with sleep complaints may consider assessing noise sensitivity.

Abstract 1570

PARENTAL EXPECTATIONS OF SLEEP NEEDS LINKED TO CHILDREN'S SLEEP DURATION AND SLEEP HYGIENE

Denise C. Jarrin, PhD, Hillary S. Rowe, BSc, Jennifer J. McGrath, PhD MPH, Pediatric Public Health Psychology Lab, Concordia University, Montreal, QC, Canada

BACKGROUND: Optimal sleep duration is vital during childhood and adolescence. Regularly sleeping the recommended number of hours positively impacts physical and mental wellbeing. Given their role in promoting and maintaining a healthy sleep regimen, it is important that parents are knowledgeable about their children's developmental sleep needs and have realistic expectations about sleep. There is limited data on parental understanding of healthy sleep. The study aim was to examine parents' expectations about sleep needs, and whether expectations are associated with children's sleep duration or sleep hygiene.

METHOD: Parents (N=377, M_{age}=47.0 yrs, 77.1% female) and their children (M_{age}=13.0 yrs; 44.0% female) participated in the Healthy Heart Project in Montreal. Parents answered questions to assess their general sleep knowledge and expectations ("*How many hours of sleep per night should the average child get?*"). Parents and children answered standardized questionnaires about sleep duration and sleep hygiene.

RESULTS: While most parents (68.5%, n=250) endorsed that "*average*children do not get enough sleep", the majority reported that their *own* child had sufficient sleep. Parents' estimates of the number of appropriate hours for their own child to sleep were age-matched with the National Sleep Foundation recommendations to yield three groups: 7.9% underestimated, 89.3% accurately estimated, and 2.7% overestimated sleep duration. A significant gradient was observed between parents' sleep expectations with children's sleep duration and hygiene (n^2_{avg}=.04), controlling for age, sex, and education. Parents who underestimated sleep needs had children with the shortest sleep duration, least favorable sleeping environments (falling asleep watching TV), and most pre-sleep negative cognitions (rumination). No differences were observed for other sleep hygiene indices (bedtime routine, bedtime consistency).

CONCLUSION: Parental expectations about appropriate sleep duration for their child were linked to the number of hours their child sleeps. Mobilizing knowledge to inform parents about developmental sleep needs and proper sleeping environments could promote longer sleep duration. Social media campaigns, schools, and pediatricians are frontline sources of information for parents, and provide an opportunity to share accurate information about children's sleep needs.

Social Relationships
Thursday, March 7 from 3:55 to 5:25 pm

Abstract 1633
CLOSE FAMILIAL RELATIONSHIPS DECREASE RISK OF DEATH FOR WIDOWERS: RESULTS FROM THE NATIONAL SOCIAL LIFE HEALTH AND AGING PROJECT (NSHAP)

Atina Manvelian, M.A., David Sbarra, Ph.D., Clinical Psychology, University of Arizona, Tucson, AZ

Background: The death of a spouse is a highly stressful social transition that is associated with a significant risk for a range of poor health outcomes, including early death. Strong social relationships may buffer the impact of stressful life events, improving health and longevity. Given the high risk of death following bereavement, understanding what promotes longevity in this population is a question of central importance. Drawing upon attachment theory and the stress-buffering hypothesis, the present study evaluated the ways in which social connections might prolong the life of widowed vs. married older adults.

Methods: Data was obtained from the National Social Life Health and Aging Project. A diverse group of older adults, including a large group of widowers (N = 1740; *n* = 426), were interviewed three times over the course of 10 years. Information about social connections, marital status, and mortality was gathered at each assessment. Logistic regression and moderation analyses were used to predict risk for all-cause mortality at the 10-year follow-up assessment as a function of marital status, self-reported quantity of platonic friendships and close familial relationships, and the interaction between marital status and these indices of social connection.

Results: Accounting for age, we found that marital status significantly interacted with the number of close familial relationships (b = -0.31, SE = .12, p < .05) but not with the number of friends (b = -0.20, SE = .11, p = ns). As shown in Figure 1, for adults who were widowed at the initial assessment, a greater number of close familial relationships are associated with significantly decreased risk of death at the final assessment, 10 years later. The interaction effect remained significant after accounting for age, gender, race, income, and self-reported health.

Conclusions: Close familial relationships (but not friendships) may differentially protect older widowed adults from risk for early death. This talk concludes with a discussion of potential mechanisms of action that may explain the link between close familial relationships and mortality.

VIEW PDF

Abstract 1833
AN EXPERIMENTAL STUDY OF THE PHYSIOLOGICAL EFFECTS OF VISIBLE AND INVISIBLE SOCIAL SUPPORT PROVIDED IN-PERSON AND VIA TEXT MESSAGE

Emily D. Hooker, Ph.D., Psychology, Chicano/Latino Studies, University of California, Irvine, Irvine, CA, Sally S. Dickerson, Ph.D., Psychology, Pace University, New York, NY

Prior research has demonstrated that the receipt of invisible social support may be psychologically beneficial when individuals are faced with a stressor, and neutral text messages, which may be similar to invisible support, have been shown to be associated with lower systolic blood pressure during and after a laboratory stressor. However, no research, to our knowledge, has explicitly tested the physiological effects of receiving invisible social support. The current study experimentally tested the physiological impact of visible and invisible support provided in-person and via text messages. In this study, participants (N=159) were asked to complete the Trier Social Stress Test, and they provided saliva samples for cortisol assays throughout the study. Participants were randomly assigned to a condition whereby their same-sex friend who joined them for the study provided social support during the speech preparation period. Social support was either in-person or via text message *and* either visible or invisible. In a fifth, friend-present condition, friends provided no explicit social support, but they accompanied participants to the study. We hypothesized that invisible support provided via text-message would be associate with the lowest cortisol trajectory followed by visible text support, friend-present support, invisible in-person support, and, finally, visible in-person support. Our initial multilevel modeling shows that the friend-present condition was associated with the lowest trajectory of cortisol responses to the stressor. Future models will include relevant covariates (e.g., menstrual cycle phase), evaluate the effect of condition at each cortisol timepoint, and incorporate relevant cultural moderators. This work will shed light on the extent to which invisible support and support provided via text-message may be important predictors of physiological responses to stress.

Abstract 1060
THE IMPACT OF ROMANTIC PARTNER'S PHYSICAL PROXIMITY AND ATTACHMENT WORKING MODELS ON CARDIOVASCULAR REACTIVITY IN THE LABORATORY

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Background: Close relationships, especially high-quality romantic relationships, are consistently associated with improved positive physical health outcomes. Cardiovascular reactivity is one physiological mechanism implicated in explaining how social relationships might affect health. Drawing on Attachment and Social Baseline theories, this experimental study evaluated two potential affiliative cues as mechanisms through which a romantic relationship may attenuate cardiovascular reactivity to a laboratory-based stressor.

Methods: Participants (N = 102) in a romantic relationship were recruited to complete a psychophysiological paradigm that included a vanilla baseline and cold pressor task. Participants were randomly assigned to either have their partner physically present, call upon the mental representation of their partner, or think about their day as an active control during the cold pressor. Specific procedures and preregistration of study hypotheses can be accessed at https://osf.io/kdt9s.

Results: Consistent with our preregistered hypotheses, participants in the partner present and mental activation conditions evidenced similar blood pressure (BP) reactivity to the cold pressor task, but had significantly lower BP reactivity for both systolic (d = -0.54, p = .007) and diastolic BP (d = -0.53, p = .005) compared to control participants, representing a difference of 4.41 and 3.38 mmHg respectively. The partner present condition reported significantly less pain after the cold pressor task compared to other participants d = -0.57, p = .016. The differences in BP reactivity by condition was moderated by relationship satisfaction, such that the difference in BP reactivity was greater for people with lower self-reported relationship satisfaction for systolic BP, B = 1.73, p = .002, and diastolic BP, B = 1.03, p = .021.

Conclusions: In this lab-based study, accessing the mental representation of a romantic partner or a partner's presence buffered against exaggerated acute stress responses similarly, and having a partner present made this process less painful. Cardiovascular reactivity is one physiological mechanisms that may explain how close relationships are linked to physical health outcomes, and these results suggest that mental activation of working attachment models buffers against BP reactivity to a similar degree to having a partner physically present.

VIEW PDF

Abstract 1438

TIME-VARYING ASSOCIATIONS BETWEEN SLEEP QUALITY AND AFFECTIVE STATES: EVIDENCE FOR DYADIC EFFECTS IN THE EVERYDAY LIVES OF OLDER COUPLES

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Background: Sleep is a key health behavior that contributes to both well-being and health. Unfortunately, many older adults experience difficulties with both sleep initiation and sleep maintenance. In unrelated individuals, impaired sleep quality has been associated with affective states (lower positive and higher negative affect). Little attention has been paid to the social context of sleep, although interrelations between spouses' sleep have been documented. Thus, this study examined associations between one's own sleep quality and affective states of one's spouse. Additionally, ecological validity of the existing literature would be enhanced by integrating sleep research into daily life environments. This study fills these gaps by examining actor and partner effects in time-varying associations between sleep quality and affective states in the everyday lives of older couples. **Methods**: 119 older adults couples (M_{age} = 71 years; $M_{relationship\ duration}$ = 41 years) provided simultaneous daily-life assessments 4 times per day over seven consecutive days, using 18 items of positive and negative affect. Sleep problems were assessed at baseline as part of a co-morbidity index and sleep quality and quantity were measured daily after waking up. **Results**: On average, participants' mean sleep quality across all days was 70.5 on a scale from 0-100 and their average sleep duration was 7 hours and 33 minutes per night. About one third reported sleep problems at baseline. Initial findings from multi-level models show that within older adults, better daily sleep quality goes hand in hand with less negative affect and with more positive affect. Most important for our research question, sleep quality was found to wax and wane in association with the spouse. For example, elevated sadness is not only associated with one's own sleep quality but also with one's partner's sleep quality. Further analyses will unpack the time-ordered nature of individual-level and dyadic associations. **Conclusions**: Sleep quality and affective states are closely interrelated between partners in older age. This study points to the importance of moving beyond the individual and taking into account social others such as spouses when trying to understand time-varying associations between sleep quality and affective states in older couples.

Abstract 1831

THE EFFECT OF SLEEP QUALITY ON DAILY SUPPORT PROVISION, PERCEPTIONS OF RESPONSIVENESS, AND RELATIONSHIP QUALITY IN ROMANTIC COUPLES

Heidi S. Kane, PhD, Kathryn Austin, BA, Samantha Helfers, BA, Robert A. Ackerman, PhD, Behavioral and Brain Sciences, The University of Texas at Dallas, Richardson, TX, Matthew R. Cribbet, PhD, Psychology, The University of Alabama, Tuscaloosa, AL

Emerging research suggests that sleep impacts social behavior. Specifically, poor sleep is related to lower relationship quality among couples, an important factor for mental and physical health. However, we still know very little about the specific relationship processes that explain this association. Social support interactions play a critical role in promoting relationship quality. Poor sleep may affect both the support provider's ability to provide quality support, and the support recipient's perception of the support provided. The ability to provide quality social support depends upon regulatory mechanisms that may be diminished by poor sleep such as the motivation and capacity to be responsive to a partner's needs. Poor sleep may also negatively bias perceptions of support provided. The purpose of this study is to examine how daily support provision and perceptions of partner responsiveness may mediate the link between daily sleep quality and relationship quality in couples. Cohabiting/married couples (N=128 couples) participated in a two-week daily diary study. At night, couple members completed diaries assessing if they provided support to their partners and its effectiveness, if their partners provided support to them and its effectiveness, their responsiveness to their partners, their partners' responsiveness to them, and their relationship quality that day. In the morning, couple members completed sleep diaries assessing the prior night's sleep. Wrist actigraphy was also used to objectively monitor sleep during the two weeks. We hypothesize that on days after worse than usual sleep, couple members will be less likely to provide support, provide less effective support, and be less responsive to their partners contributing to their partners' lower daily relationship quality. Additionally, we also hypothesize that on days after worse than usual sleep, couple members will also perceive support as less effective and perceive lower partner responsiveness contributing to lower relationship quality. Data collection is complete, and data analyses will be completed by February. Ultimately, these data may inform couple-specific interventions aimed at improving mental and physical health by strengthening relationship quality and coping, and may suggest that couple-specific interventions are less effective when sleep is not considered.

Abstract 1134

TESTOSTERONE TO CORTISOL RATIO AND AGGRESSION TOWARD ONE'S ROMANTIC PARTNER AFTER A CONFLICT DISCUSSION: A TEST OF THE MODERATING EFFECT OF PROVOCATION

Andrew W. Manigault, M.S., Peggy M. Zoccola, Ph.D., Katrina Hamilton, M.S., Brian T. Wymbs, Ph.D., Psychology, Ohio University, Athens, OH

The dual-hormone hypothesis posits that the combination of greater testosterone and lower cortisol is associated with greater aggression. However, two recent studies indicate that this association is weaker or even reversed when predicting provoked aggression.

The current study tested the dual-hormone hypothesis in a sample of 32 heterosexual young adult romantic couples who engaged in a conflict discussion and then a competitive task in the laboratory. Aggressive behavior was indexed by greater noise blast intensity toward one's partner during the competitive task. Two potential sources of provocation were examined: 1) degree of negative and positive affective responses to a conflict discussion task (coded using the Interactional Dimensions Coding System), and 2) whether or not participants received a noise blast before each trial of the competitive task. Salivary testosterone and cortisol were assessed 3 times during the laboratory session, and their ratio was calculated (T/C AUCg ratio). The ratio of negative affect to positive affect during the conflict discussion was used to infer provocation (where greater ratios indicate greater provocation).

Consistent with the dual-hormone hypothesis, greater AUCg T/C ratios (i.e., higher T, lower C) were associated with greater average noise blast intensity (b=1.02, F(1,58)=4.96, p=.030). Moreover, this association was significant during the unprovoked aggression trial (b=1.07, F(1,58)=5.24, p=.026) and non-significant during the provoked aggression trial (b=.98, F(1,58)=2.42, p=.12) of the competitive task. Finally, T/C ratio was positively associated with average noise blast intensity when affective responses to the conflict discussion task were less negative/more positive (indicating little/no provocation; b=2.04, F(1,56)=11.59, p=.001), and unrelated to noise blast intensity when affective responses to the conflict discussion task were more negative/less positive (indicating provocation; b=-.16, F(1,56)=.05, p=.80).

The current study supports the dual-hormone hypothesis, such that higher T/C ratios predicted greater aggression. Furthermore, the association between T/C ratio and aggression may be weaker (and

may trends towards reversal) following provocation. The dual-hormone hypothesis may be limited to predicting human aggressive behaviors that are unprovoked and/or instrumental to asserting dominance or status.

VIEW PDF

Socioeconomic Status
Thursday, March 7 from 11:00 am to 12:00 pm

Abstract 1770
SUBJECTIVE SOCIOECONOMIC STATUS AND C-REACTIVE PROTEIN IN CHILDREN AND ADOLESCENTS
Eloïse Fairbank, BA, Jennifer J. McGrath, PhD MPH, Pediatric Public Health Psychology Lab, Concordia University, Montreal, QC, Canada
BACKGROUND: Psychoneuroimmunology has pioneered discoveries linking chronic stress exposure and the inflammatory response. One form of chronic stress exposure is low socioeconomic status (SES). Low SES during childhood robustly predicts adult inflammation, which in turn is associated with adverse health outcomes (cardiovascular disease, cancer, depression). In pediatric populations, the relation between SES and inflammation is less consistent. Some findings suggest conditional relations between household income and inflammation in children. Less is known about the effects of children's subjective SES on inflammation. The study aim was to examine the cross-sectional association between SES and high-sensitivity C-reactive protein (CRP) in children and adolescents.
METHOD: Children and adolescents (N=245; M_{age}=13.97 yrs; 58.6% male) participated in the larger Healthy Heart Project in Montreal. Blood samples were assayed to quantify CRP. Children completed the MacArthur Ladder Scales as measures of subjective SES (school, society). Parents reported household income and education as measures of objective SES. Linear regressions were conducted, controlling for age, sex, ethnicity, and BMI Z-score.
RESULTS: Subjective SES (school B=-.175, p=.002, η^2=.04; society B=-.181, p=.009, η^2=.03) was significantly associated with CRP, even after adjusting for objective SES. Age-stratified follow-up analyses indicated that among children (<13 yrs), school status was associated with CRP (B=-.305, p=.001, η^2=.10); while among adolescents (>=13 yrs), society status was associated with CRP (B=-.211, p=.012, η^2=.05).
CONCLUSION: Subjective SES was modestly associated, cross-sectionally, to CRP in youth. Findings suggest perception of one's school and societal status may reflect shifts in social comparison groups as they become prominent differentially across development. The main effect of SES on inflammation is consistent with past research in adolescents. These findings suggest that the inflammatory pathway emerges early in the life course and may be a plausible mechanism underlying the socioeconomic gradient of health disparities. Future research should replicate these findings and extend to longitudinal comparisons.

Abstract 1179
ATTENDING SCHOOLS WITH GREATER SOCIOECONOMIC-BASED ACHIEVEMENT GAPS PREDICTS WORSE ADOLESCENT AND ADULT HEALTH AMONG LOWER SOCIOECONOMIC STATUS STUDENTS
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Children who grow up in families with lower socioeconomic status are at greater risk for a range of negative health outcomes, including cardiovascular disease. Research on the psychosocial contributors to these disparities has focused largely on factors in the neighborhood and in the family environment. Less attention has been paid to the role of the school environment. The present research highlights a novel characteristic of the school environment that is related to the health of students from lower socioeconomic backgrounds. Specifically, we tested whether students from lower socioeconomic backgrounds (operationalized as neither parent having attended college) had worse health when they attended schools where there was a greater (versus smaller) socioeconomic gap in academic achievement. To test this hypothesis, we used data from the National Longitudinal Study of Adolescent to Adult Health (Add Health; Ns ranged from 13,044 – 16,848). Analyses showed that, as hypothesized, students whose parents did not attend college reported having worse health and were more frequently absent from school due to illness when they attended schools where there was a greater (vs. smaller) gap between the mean grade point averages of students whose parents did and did not attend college. Furthermore, 13-14 years later as young adults, these students whose parents did not attend college and who had attended schools with greater socioeconomic-based achievement gaps had more clinically elevated signs of metabolic syndrome, a higher body mass index, and marginally higher levels of C-reactive protein, even controlling for their baseline health status (i.e., controlling for their self-rated health when they were in school). All results hold controlling for participant age, gender, race, immigration status, demographic characteristics of the school's student body, the mean grade point average of students in the school, whether the school was public or private, and whether the school tracked students. Results thus suggest that attending a school with greater socioeconomic disparities in grades could undermine the health of children from lower socioeconomic backgrounds, putting them at risk for cardiovascular disease and other chronic diseases of aging down the line.

Abstract 1011
LIFE COURSE SOCIOECONOMIC STATUS, DAILY STRESSOR REACTIVITY, RISK FACTORS OF CHRONIC KIDNEY DISEASE, AND KIDNEY FUNCTION AMONG ADULTS IN THE MIDLIFE IN THE UNITED STATES (MIDUS) STUDY
Agus Surachman, MS, Human Development and Family Studies, The Pennsylvania State University, University Park, PA, Jonathan Rush, PhD, Psychology, University of Victoria, Victoria, BC, Canada, Lacy Alexander, PhD, Kinesiology, The Pennsylvania State University, University Park, PA, Christopher Coe, PhD, Psychology, University of Wisconsin-Madison, Madison, WI, David Almeida, PhD, Human Development and Family Studies, The Pennsylvania State University, University Park, PA
Chronic kidney disease (CKD) is an increasing public health problem in the United States and all over the globe. However, there is a lack of understanding regarding life course socioeconomic and daily psychosocial correlates of kidney function in adulthood. This paper examines the association between life course socioeconomic status (SES), daily stressor reactivity, risk factors of CKD, and estimated glomerular filtration rate (eGFR) among non-clinical sample in the United States. Data are from 1174 participants (40-84 years; 56% female) who completed baseline survey, 8-day daily diary study, and biomarker assessment of the Midlife in the United States (MIDUS) Study wave 2 (2004-2006; N = 917) and Refresher (2011-2016; N = 257). Life course SES included childhood SES and adult SES. Daily stress reactivity was defined as changes in the levels of daily negative affect and daily physical symptom associated with the experience of daily stressors. Three risk factors of CKD were included in this study: hypertension, diabetes, and obesity. GFR was estimated from serum creatinine, calculated using the CKD-EPI formula (adjusted for age, gender, and race). We hypothesized that life course SES was associated with kidney function through daily stressor reactivity and risk factors of CKD. Hypothesized model was tested using multilevel

structural equation modeling. The final model indicated that adult SES, but not childhood SES, was associated with affect and physical reactivity to daily stressors. Physical reactivity, but not affective reactivity to daily stressors was associated with more CKD risk factors. Both adult SES and childhood SES were also associated with the number of CKD risk factors. A higher number of CKD risk factors was associated with lower levels of eGFR. There was also a direct association between adult SES and eGFR. This study provides a clue that early life SES may be associated with CKD through the development of hypertension, diabetes, and obesity. On the other hand, current SES may be associated with CKD through multiple pathways, including daily stressor reactivity, development of CKD risk factors, and direct influence on kidney function.

VIEW PDF

Abstract 1192

PSYCHOSOCIAL MODERATORS OF SOCIODEMOGRAPHIC HEALTH DISPARITIES IN THE HEALTHY AGING IN NEIGHBORHOODS OF DIVERSITY ACROSS THE LIFE SPAN (HANDLS) STUDY

Lauren M. Faulkner, M.A., Psychology, University of Maryland, Baltimore County, Baltimore, MD, Angelina R. Sutin, Ph.D., Department of Behavioral Sciences & Social Medicine, Florida State University College of Medicine, Tallahassee, FL, Michele K. Evans, MD, Laboratory of Epidemiology and Population Science, Alan B. Zonderman, Ph.D., Behavioral Epidemiology Section, National Institute on Aging, Baltimore, MD, Shari R. Waldstein, Ph.D., Psychology, University of Maryland, Baltimore County, Baltimore, MD

Background: Higher resting blood pressure (BP) and hypertension are major risk factors for cardiovascular disease (CVD) with pronounced disparities, with African American race, lower socioeconomic status (SES), and male sex more likely to exhibit each risk factor. The current study examined whether social support (SS) and extraversion moderate the relations of race, SES, and sex to resting BP and hypertension.

M**ethods**: Participants were 386 African American (AA) and White, urban-dwelling adults (mean age = 49, 67% female, 52% AA, 53% living in poverty) from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study who completed standard measures of BP, the NEO Personality Inventory – Revised, and reported on frequency of support from friends and family. Regression analyses were used to examine three-way interactions of a single sociodemographic factor (race, SES, or sex), SS, and extraversion to resting systolic and diastolic BP and hypertension. Separate analyses were conducted for each sociodemographic factor. Analyses adjusted for age, depressive symptoms, body mass index, smoking, and antihypertensive medication use (BP models only).

Results: There were significant three-way interactions of race, SS, and extraversion for systolic BP ($p < .01$), diastolic BP ($p < .01$), and hypertension ($p < .05$). Among AAs, greater emotional support was associated with higher resting BP and greater likelihood of hypertension, but only among introverted individuals. There were also significant interactions of SES, SS, and extraversion for systolic ($p < .05$) and diastolic BP ($p < .05$), and hypertension ($p < .05$). Among AAs and Whites living in poverty, greater emotional support was associated with higher resting BP and greater likelihood of hypertension, but only among introverted individuals. None of the three-way interactions of sex, social support, and extraversion were significant.

Discussion: Racial and socioeconomic disparities in cardiovascular health interact with social and individual factors. Interestingly, social support may not have universal benefit for cardiovascular health. For certain vulnerable identities, namely AA race and low SES, frequent social support appears less likely to influence cardiovascular health if the person receiving the support is introverted.

Stress

Thursday, March 7 from 3:55 to 5:25 pm

Abstract 1742

STRESS-INDUCED TRANSIENT ENDOTHELIAL DYSFUNCTION IS ASSOCIATED WITH ADVERSE OUTCOMES IN CORONARY ARTERY DISEASE PATIENTS

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Background: Acute mental stress can result in transient endothelial dysfunction but the prognostic significance of this phenomenon is unknown. Our goal was to examine the relationship between mental stress-induced impairment in endothelium-dependent relaxation, assessed by brachial artery flow-mediated vasodilation (FMD), and major adverse outcomes among individuals with stable coronary artery disease (CAD).

Methods: We subjected 577 study participants (age 63±9 years, 25% women) to mental stress (speech task). FMD was measured at rest and 30 minutes after mental stress and expressed as % hyperemic dilation. Transient endothelial dysfunction was defined as a reduction in FMD after mental stress. We used the rest, post-stress and delta (stress minus rest) FMD as predictors of an adjudicated composite endpoint of adverse events, including cardiovascular death, myocardial infarction, unstable angina with revascularization and heart failure hospitalization in Cox-proportional hazards models, adjusting for sociodemographic factors, medical history and depression.

Results: There was an average 19% drop in FMD with mental stress, and 64% of subjects developed transient endothelial dysfunction. During a median follow-up of 3 years, 74 patients experienced adverse events. Patients with events, compared with those without, had a significantly lower post-stress FMD (4.0% vs. 2.6% p=0.001), but not rest FMD (4.8% vs 4.4%, p=0.3). Both post-stress FMD and delta FMD were highly predictive of adverse events, with adjusted HRs of 1.17 (95% CI, 1.05-1.29, p=0.003) and 1.15 (95% CI, 1.02-1.28, p=0.005), respectively, for each one percentage point lower FMD. In contrast, rest FMD was not predictive of adverse events (adjusted HR, 1.03; 95% CI, 0.96-1.10, p=0.4, for each one percentage point lower FMD). Development of transient endothelial dysfunction with stress was associated with an adjusted 87% increase in adverse events (p=0.03) (Figure). Risk prediction statistics demonstrated a significant model improvement for adding post-stress or delta FMD to a prediction model beyond rest FMD and known prognostic factors.

Conclusions: Transient endothelial dysfunction with stress is associated with adverse cardiovascular outcomes in patients with CAD. Endothelial responses to stress represent a possible mechanism through which psychological stress may affect prognosis in CAD patients.

VIEW PDF

Abstract 1202

BETA-ADRENERGIC BLOCKADE BLUNTS INFLAMMATORY AND ANTIVIRAL/ANTIBODY GENE EXPRESSION RESPONSES TO ACUTE SOCIAL STRESS

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Psychological stress is a well-established driver in the etiology of disease and mental illness, and growing work investigates the biological mechanisms by which stress impacts these outcomes. Inflammation is one promising pathway bridging stress to disease. Chronic psychological stress can lead to increased inflammatory gene expression and decreased antiviral/antibody-related gene expression, termed the Conserved Transcriptional Response to Adversity (CTRA). However, little research investigates if similar patterns of gene expression are observed under acute stress, especially in humans. To address this gap, we administered either a 40 mg dose of propranolol or placebo to 90 healthy young adults (45% female) in a double-blind, placebo-controlled trial. Subjects then completed the Trier Social Stress Test (TSST) during which they completed a mock job interview and mental arithmetic. Pre- and post-TSST blood samples were assayed for gene expression. Analyses of change in gene expression from baseline to follow-up showed increased expression of both inflammation and antiviral/antibody-related genes in response to the TSST, and these effects were blocked by pre-treatment with propranolol. Bioinformatics analyses implicated CREB family transcription factors in mediating these effects and identified natural killer (NK) cells and dendritic cells (DCs) as the primary cellular context for transcriptional up-regulation and monocytes as the primary cellular carrier of genes down-regulated by the TSST. Statistical analyses suggested that many of these effects could be accounted for by acute changes in the prevalence of circulating NK cells, DCs, and monocytes. These data suggest that acute stress induces a "defensive" molecular phenotype that is distinct from the classical CTRA profile associated with chronic stress. Instead, this distinctive CTRA profile is mediated by beta-adrenergic signaling and involves acute mobilization of NK cells and DCs at the expense of monocytes. Altogether, these findings offer some of the first evidence that propranolol can decrease inflammatory gene expression during acute social stress in humans, which may represent an adaptive response to the risk of acute injury at the expense of chronic disease risk. Future research is warranted to clarify the health implications of these results.

Abstract 1518

REACTIVITY TO ACUTE PSYCHOLOGICAL STRESS AND ITS RELATIONSHIP TO FUTURE HEALTH AND DISEASE OUTCOMES: A SYSTEMATIC REVIEW OF PROSPECTIVE EVIDENCE

Anne I. Turner, PhD, Institute for Physical Activity and Nutrition (IPAN), Deakin University, Burwood, Australia, Nina Smyth, PhD, Psychology, University of Westminster, London, United Kingdom, Sarah J. Hall, PhD, Susan J. Torres, PhD, Mais Hussein, BFSN (Honours), Sisitha U. Jayasinghe, PhD, Kylie Ball, PhD, Institute for Physical Activity and Nutrition (IPAN), Deakin University, Burwood, Australia, Angela J. Clow, PhD, Psychology, University of Westminster, London, United Kingdom

Background

Acute psychological stress activates neuroendocrine systems stimulating cardiovascular responses and cortisol secretion. The relevance of this stress reactivity to long-term health and disease outcomes is an important conundrum. We tested the hypothesis that the magnitude of the response to acute psychological stress in healthy participants predicts future health and disease outcomes.

Methods

We searched Medline Complete, PsycINFO, CINAHL Complete and Embase up to Nov 2017. Included studies were peer-reviewed, English-language, prospective studies in apparently healthy adults. The exposure was acute psychological stress reactivity at baseline. Stress reactivity variables measured at baseline included cortisol, systolic blood pressure, diastolic blood pressure, heart rate, epinephrine, norepinephrine or salivary alpha-amylase. The outcome was any health or disease outcome at follow-up after ≥ 1 year.

Results

We identified 1,499 papers through database searching and 1 additional paper through other sources. Forty-six papers met our criteria with 30 - 4100 participants per study and 1 - 23 years of follow-up. Exaggerated (i.e. high) stress reactivity at baseline predicted higher resting blood pressure, greater risk of hypertension, greater carotid intima-media thickness, greater coronary artery calcification and shorter telomeres at follow-up. Blunted (i.e. low) stress reactivity at baseline predicted greater BMI, waist circumference and triceps skin-fold thickness, increased likelihood of obesity, more depression symptoms, more PTSD symptomology after exposure to new-onset traumatic events, reduced cognitive ability, poorer self-reported health, a greater progression of physical disability and, in males, lower bone mass at follow-up.

Conclusion

Exaggerated and blunted stress reactivity predict a wide range of negative outcomes over time. Future research should examine biological pathways by which both exaggerated and blunted stress reactivity may impact health.

Abstract 1730

ASSOCIATION OF REPEATED ASSESSMENTS OF PERCEIVED STRESS, ANXIETY, AND ANGER WITH SUBSEQUENT HOSPITALIZATIONS IN PATIENTS WITH HEART FAILURE: THREE YEAR FOLLOW-UP

David S. Krantz, Ph.D., Andrew J. Dimond, M.S., Andrew J. Waters, Ph.D., Keen-Song Liew, M.A., Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD, Stephen S. Gottlieb, M.D., University of Maryland Medical Center, Baltimore, MD

Background. Rehospitalizations are a serious problem in patients with heart failure (HF). This study examined relationships of multiple assessments of perceived stress, state anxiety, and recent anger to hospitalizations in HF patients. **Methods**. 147 patients with reduced-EF HF (77% male; age 57.4+11.5) were studied. Stress (Perceived Stress Scale; PSS), state anxiety (STAI), and a measure of past week's anger were examined at baseline and 3 months, and at subsequent 6 month intervals for 36 months. Verified hospitalizations (all-cause, cardiac-related) before next assessment were examined. Covariate-adjusted Linear Mixed Models were used to determine relationships of: between-subject mean scores across assessments ("chronic" effects); and within-subject deviations from mean scores ("acute" effects) to hospitalizations before next assessment. **Results.** During the study, there were 534 all-cause (M=3.56+9.27), and 277 cardiac-related (M=1.85+3.16) hospitalizations. In adjusted analyses, PSS was associated with all-cause hospitalizations at between- (Mean PSS; OR=1.06, 95% CI 1.02-1.11) and within-subject (Deviation PSS; OR=1.03, 95% CI 1.01-1.06) levels, and cardiac hospitalizations at between-subject level (OR=1.05, 95% CI 1.00-1.09). Mean state anxiety scores (between-subject level) were associated with all-cause (OR=1.06, 95% CI 1.03-1.10) and cardiac hospitalizations (OR=1.05, 95% CI 1.02-1.09). Weekly anger was not related to all-cause or cardiac hospitalizations. Analyses of individual psychological predictors controlling for the other 2 psychological variables indicated that STAI anxiety remained independently associated with all-cause

hospitalizations at the between-subject level (B=0.06, SE=0.03, p=0.02), and PSS was independently associated with all-cause hospitalizations at the within-subject level (B=0.03, SE=0.02, p=0.04). **Conclusion.** Using repeated measurements of psychological variables, mean perceived stress and anxiety, and elevations in perceived stress (compared with patient-specific average) were associated with subsequent hospitalizations in HF patients. Anger in the week prior to assessments was not associated with hospitalizations. Controlling for the other variables, perceived stress and anxiety show independent associations with hospitalizations. Mechanisms may involve changes in physiological activation and/or health behaviors.

Abstract 1594

PREDICTING SICK-LEAVE RATES AT THE WORK-GROUP LEVEL: WHY DO AVERAGED PSYCHOSOCIAL WORK CONDITIONS MATTER MORE THAN AVERAGED MEDICAL CONDITONS OR GROUP AVERAGE HEALTH BEHAVIORS?

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Background: Sick-leave rates from mental illness or back-pain pose a considerable economic burden to employees, particularly in countries where statutory regulations imply full continuation of employee remuneration for extend periods (up to 42 days) and incentives for health professionals issuing sick-leave certificates to minimize absence are lacking.

Methods: Prospective multicenter cohort study in a German automotive manufacturing group. The dependent variable was work-group sickness-leave rates in 2015. Eligible for participation were work-groups invited for participation in a comprehensive health-check in 2014 and at least 10 participants consenting to scientific evaluation of the data. We regressed 2015 sick-leave rates onto medical, health behavioral and psychosocial predictors of 2014 examination, controlling for 2014 sick-leave rates, proportion of blue-collar employees, gender and age.

Results: In 2014 a total of 4242 employees from 7 sites and 59 distinct work-groups partook in the health examination, consented to scientific evaluation and had full data available. In- and exclusion criteria left 3857 subjects from 44 work-groups for analysis. Sick-leave rates varied from 1% to 12% across groups, within-group proportion of blue-collar workers ranged from 0% to 98%. Significant medical or health-behavioral predictors after controlling for age, gender, blue-collar proportion and 2014 sick-leave rates were (standardized beta): alcohol consumption (0.45), physical exercise (0.31), body mass index (-0.12), metabolic syndrome (0.42), Framingham cardiovascular risk (0.08), smoking status (0.27), preexisting conditions (0.02), adj R-sq = 0.54. In comparison psychosocial work characteristics yielded equal or larger estimates (adj R-sq = 0.63): good leadership (-0.2), commitment (0.2), higher decision latitude (-0.5), higher quantitative demands (-0.26), higher job control (-0.14), higher job predictability (-0.51), skill development opportunities (-0.41), higher decision latitude (-0.51). The latter model fully accounted for the autocorrelation of 2014 and 2015 sick-leave rates.

Discussion: Psychosocial work characteristics averaged at the group level are equally or better predictors of work-group sick-leave rates in a 12-month follow-up multi-center study than medical findings or history.

Abstract 1664

MOBILE MEASUREMENT OF PSYCHOLOGICAL STRESS: AN EXPLORATORY PILOT STUDY COMPARING PASSIVE MOBILE PHONE SENSING DATA WITH BIOLOGICAL AND SELF-REPORTED STRESS

Michelle L. Byrne, Ph.D., Sarah R. Horn, M.S., Melissa L. Barnes, M.S., Monika N. Lind, M.S., Kathryn L. Mills, Ph.D., Benjamin W. Nelson, M.S., Psychology, University of Oregon, Eugene, OR, George M. Slavich, Ph.D., Cousins Center for Psychoneuroimmunology and Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA, Nicholas B. Allen, Ph.D., Psychology, University of Oregon, Eugene, OR

Background: Intensive longitudinal assessment of individual behavior may provide new insights into the early identification of modifiable risk factors for disease. We addressed this issue by exploring novel indices of psychosocial stress - a reliable predictor of disease risk - using a passive mobile sensing collection tool (EARS). EARS continuously collected naturalistic behavior via smartphone data (language use, geolocation), which was then validated against other stress markers—perceived stress, mental health symptoms, immune markers, sleep, and cumulative life stress exposure.

Methods: We assessed 24 healthy young adults. Measures of self-reported stress included the Depression Anxiety Stress Scales, Perceived Stress Scale, and Stress and Adversity Inventory (STRAIN). Biological stress was measured with salivary C-reactive protein (CRP), interleukin(IL)1-β, and secretory immunoglobulin(SIg)A. Using the EARS tool, a custom keyboard logged every third word typed into the phone across all apps to measure affective language use. The keyboard also uploaded a geotag (latitude and longitude) to measure time away from home for a subset of people (N=10).

Results: Some salivary immune markers were intercorrelated (IL-1β negatively with SIgA and CRP). In turn, total count of STRAIN-related stressful life events and difficulties was negatively related to CRP and total hours of nightly sleep, and positively with IL-1β, anxiety levels and perceived stress. Less sleep was also related to greater anxiety and perceived stress. Most of the scales on the DASS and the PSS were intercorrelated, showing good reliability within the self-reported and biological measures of stress. For the passive sensing measures, more positive affective language was associated with immune functioning (SIgA, IL-1β) and higher depressive symptoms, and although data were limited, time spent away from home was positively associated with IL-1β.

Conclusions: Naturalistic behavioral data can be intensively collected from mobile phones, and evidence suggests that some behaviors are related to other measures of mental health and stress. Future research with larger samples is needed to examine the robustness of these effects. Next, we will examine if language use, geolocation, and other passively sensed behaviors (facial expression, acoustic voice, app usage, etc.) are associated with clinical outcomes.

SYMPOSIA

Symposium 1001
Thursday, March 7 from 3:55 to 5:25 pm

HOT TOPICS IN BRAIN-GUT INTERACTION

Maida J. Sewitch, PhD, Medicine, McGill University and the Research Institute of the McGill University Health Centre, Montreal, QC, Canada, Susan B. Levenstein, MD, Aventino Medical Group, Rome, Italy, Emeran A. Mayer, MD, Division of Digestive Diseases, David Geffen School of Medicine, UCLA, Los Angeles, CA, Lukas Van Oudenhove, MD, PhD, Clinical and Experimental Medicine, University of Leuven, Leuven, Belgium, Laurie Keefer, PhD, Medicine, Mount Sinai Hospital, New York City, NY, Douglas A. Drossman, MD, Gastroenterology, University of North Carolina, Chapel Hill, NC

The gut–brain axis is the biochemical signaling that takes place between the gastrointestinal tract and the central nervous system. The brain, gut and gut microbiome constantly communicate with each other through neural, immunological and hormonal messages. Mounting evidence suggests gut microbiota strongly influences health including mood and behaviour. Most of the communication done by neurons living in the digestive track carries information to rather than from the brain, which may make the gut as important to mood as the brain. Stress can influence the type of bacteria that live in the gut, which can change the diversity of bowel flora and increase susceptibility to harmful bacteria. Stress can also increase bowel inflammation, which increases vulnerability to infection. Although gut microbiota depend on the consumption of nutrients and water, the ability to regulate bacterial growth is also controlled through pathways that control energy balance. Regulation of food intake may depend on bacteria-host communication and not solely on bidirectional gut-brain signaling. These scientific advances on the gut-brain axis have inspired new ways of thinking about and treating the human mind and body.

This symposium will present recent findings in the rapidly expanding area of brain-gut interactions. It will include a brief introduction by the chair and presentations by four world-renowned clinician-researchers. The first speaker will present findings that support the hypothesized role of bidirectional brain-gut microbiome interactions in irritable bowel syndrome pathophysiology. The second speaker will provide an overview of human research findings on the role of the gut-brain axis in appetite and feeding control as well as affective and reward processes in general, and outline their clinical implications for obesity, eating disorders and mood disorders. The third speaker will present work on advances in both the methods and delivery mechanisms of two evidence-based psychotherapies: GI based cognitive behavior therapy and gut-directed hypnotherapy, which are collectively known as brain-gut psychotherapy. The fourth speaker will present the pharmacological basis for using central neuromodulators, also known as antidepressants and antipsychotics, to treat GI disorders and provide guidelines for their use that is targeted to specific clinical profiles.

Individual Abstract Number: 1029
Brain gut microbiome interactions in IBS

Emeran A. Mayer, MD, Division of Digestive Diseases, David Geffen School of Medicine, UCLA, Los Angeles, CA

Considerable preclinical evidence supports a role of the gut microbiome in the modulation of the nervous system, however clinical evidence for a causative role of the microbiota in modulation of brain gut interactions in humans is currently not available. Similarly, despite a growing number of cross sectional microbiome analyses in IBS patients, there is no consensus about alterations in the community structure or function, or the role of such alterations in IBS pathophysiology.

However, a series of recent studies provides further evidence for such a role in IBS: In healthy individuals, manipulation of the gut microbiome by the daily intake of a probiotic consortium over 4 weeks causes alterations in the engagement of brain circuits concerned with emotion recognition, without any effect on levels of mood and anxiety or gut function. In IBS patients there is an association of gut microbial composition in a subset of patients with structural differences in sensorimotor network regions of the brain. Tripartite association network analysis of gut microbes, brain parameters and sensorimotor function IBS subjects has shown an association of gut microbial Clostridia with brain functional connectivity and gastrointestinal sensorimotor function in IBS patients. Responders to cognitive behavioral therapy show changes in relative gut microbial abundances compared to non-responders, and pretreatment microbial composition predicts responder status. These recent findings support the hypothesis of a role of bidirectional brain gut microbiome interactions in IBS pathophysiology. A model for these interactions is proposed.

Individual Abstract Number: 1028
Food and Mood: gastrointestinal control of the human reward system

Lukas Van Oudenhove, MD, PhD, Clinical and Experimental Medicine, University of Leuven, Leuven, Belgium, Nathalie Weltens, PhD, Chronic Diseases, Metabolism, and Ageing, KU Leuven, Leuven, Belgium

The gut-brain axis, the complex bidirectional neurohumoral communication system between the gastrointestinal tract and the central nervous system, plays a key role in the regulation of appetite and food intake. More specifically, it is becoming increasingly clear that interoceptive signals reflecting the body's nutritional and energy resources, including neural signals reflecting gastric distension and metabolic hormones produced by the GI tract, not only impact on homeostatic neurocircuitry in the brain, but also on the emotional brain in general and the brain's reward system in particular. While the former system, including hypothalamic and brainstem nuclei, regulates feeding based on current or long-term energy and nutritional needs of the body, the latter system includes midbrain projections to striatal and extrastriatal regions and regulates feeding by representing the motivational and hedonic properties of food-related stimuli. In this talk, I will give an overview of recent mechanistic human research by my own group and others on the role of the gut-brain axis in appetite and feeding control as well as affective and reward processes in general, and outline the implications of this work for obesity, eating disorders, and mood disorders.

Individual Abstract Number: 1010
Brain-Gut Psychotherapy

Laurie A. Keefer, PhD, Gastroenterology, Icahn School of Medicine at Mount Sinai, New York, NY

Brain-gut psychotherapies target the brain-based processes which impact symptom perception across the spectrum of GI diseases. Pressures to reduce cost and increase access have led to recent breakthroughs in the mode of delivery of 2 common brain-gut psychotherapies, Cognitive Behavior Terapy - GI (CBT-GI) and gut-directed hypnotherapy (GDH).

CBT-GI: The efficacy of CBT-GI has been well-established in >30 RCTs [NNT = 4]. CBT-GI targets hyperarousal, fear of symptoms, castrophizing and inflexible coping, all of which have been shown to amplify normal sensations from the gut at the level of the brain. The upfront cost of CBT-GI, as well as therapist and patient time is

significantly higher than that of psychotropics and there is a substantial need to find CBT-GI programs which can be delivered faster and cheaper. In our recent RCT of CBT-GI for IBS, 436 patients received Standard-CBT (S-CBT, n = 146, comprising 10 weekly, 60-minute sessions); 2) Minimal-therapist contact CBT (MC-CBT, n = 145), in which patients atttened 4 monthly, 60-minute sessions + home-based workbook), or 4 sessions of IBS education (EDU, n = 145). Primary outcome was Clinical Global Impressions-Improvement Scale. MC-CBT [61% improved] was as effective as SCBT [54.5% improved] and superior to EDU [45.8% improved] at post-treatment; results were maintained at 6 months with the MCCBT condition having the least amount of decay by one year [Lackner, Jaccard, Keefer et al., 2018, Gastroenterology, 155:47-57]. Cost-effectiveness data will be available.

GDH: GDH targets hyperarousal and stress sensivity, somatic over-attention, pain thresholds and visceral anxiety and has been shown to be effective in a wide range of digestive disorders including IBS, IBD, GERD, non-cardiac chest pain and pediatric abdominal pain. There are two validated GDH protocols (Manchester, Peter Whorwell; and North Carolina, Olafur Palsson), each of which has independently demonstrated efficacy in RCTs, with an average of 50% GI symptom improvement in 75-80% of refractory patients; however, access to trained GDH therapists is significantly limited. The North Carolina protocol is being evaluated as a digital therapeutic with good preliminary success, suggesting that hypnotherapy could be delivered online and with minimal therapist contact, increasing access to care. Results from the first 20 patients will be presented.

Individual Abstract Number: 1009

Central Neuromodulators for Chronic GI Pain

Douglas A. Drossman, MD, Gastroenterology, University of North Carolina, Chapel Hill, NC

Functional GI diagnoses (FGIDs): functional chest pain, dyspepsia (EPS), IBS, centrally mediated abdominal pain (CAPS), functional biliary pain and levator syndrome can be challenging to understand and treat as the pain is not attributed to any structural abnormalities and reflect brain-gut dysregulation. Chronic pain also occurs with structural GI disorders (e.g., IBD, chronic painful pancreatitis) where both pain regulation and treatment of the underlying disease is needed. The relative contributions of the brain and gut in determining symptoms vary depending on the nature of the disorder, the chronicity of the pain and the unique biopsychosocial features of the individual afflicted. While GI pain may have peripheral derivatives, i.e., structural disease or visceral hypersensitivity, as pain becomes more severe and constant, there is a shift toward greater disruption of CNS regulatory pathways which correlates with greater psychosocial disturbance.

With this new understanding the terminology for pain medications should reflect treatment of brain-gut dysfunction rather than psychiatric disease. For example, medical patients may be reluctant to use “antidepressants” for GI symptoms, and clinicians may prescribe them incorrectly for presumed psychiatric disease. The Rome Foundation’s guidelines relabel these agents as “gut-brain neuromodulators”. This includes the primarily central neuromodulators (antidepressants, antipsychotics) and the primarily peripheral neuromodulators (serotonergic, chloride channel, delta ligand agents, etc.). This terminology may help improve understanding of their pharmacological value, reduce stigma and improve treatment adherence.

Central neuromodulators can help chronic GI pain in several ways: treatment of comorbid psychiatric disorders, improvement of gastrointestinal motility, reduction of afferent visceral nerve signaling and enhancement of central downregulation pain modulation pathways. Treatment may also enhance neurogenesis, which may potentially help reverse the severity of the disorder.

We will address the pharmacological basis for using central neuromodulators and then provide guidelines for their use targeted to specific clinical profiles. Following this, we will discuss enhanced treatment including augmentation. Finally we will help the clinician improve patient engagement and adherence to optimize treatment response.

Symposium 1044
Friday, March 8 from 1:30 to 2:45 pm

The Necessary Inseparability of Mind and Body: Implications of Computational Neuroscience for Psychosomatic Medicine

Sarah N. Garfinkel, PhD, Neuroscience, Brighton and Sussex Medical School, University of Sussex, Falmer, , United Kingdom, Sahib S. Khalsa, MD, PhD, Laureate Institute for Brain Research, University of Tulsa, Tulsa, OK, Hugo D. Critchley, DPhil, Clinical Neuroscience and Neuroimaging, Brighton and Sussex Medical School, Brighton, , United Kingdom, Frederike Petzschner, PhD, Institute for Biomedical Engineering, ETH Zurich, Zurich, , Switzerland, Ryan S. Smith, PhD, Psychiatry, Laureate Institute for Brain Research, Tulsa, OK, Richard D. Lane, M.D., Ph.D., Psychiatry, University of Arizona, Tucson, AZ

Computational neuroscience is a relatively recent advance that is transforming our understanding of how the mind works. It is based on the actual calculations that neurons and neural systems make to perform their functions. This approach has provided a new understanding of the functional architecture and dynamics of the human brain in interaction with the body and has garnered support in a variety of psychological and biological domains. Key advances include the realization that the human brain is predictive rather than reactive and (drawing from cybernetics) that systems are regulated by feedback about the consequences of regulatory signals generated by predictions. As such, perceptions of the environment simultaneously and necessarily entail estimation of the behavioral responses needed to respond to environmental input and the visceromotor responses needed to support such anticipated action, and bodily feedback influences -- and is strongly influenced by -- predictions about bodily responses associated with the evaluation of personal and social circumstances. Therefore perception (personal and social) and action, mind and body are inextricably linked and inseparable.

This symposium aims to acquaint newcomers to computational neuroscience with fundamental principles and applications to psychosomatic research at the conceptual level. The first speaker will describe how discrepancies between bottom up and top down interoceptive signals can influence psychopathology via the development of somatic error, and will relate this to a computational model of an 8-level neural hierarchy of vagus nerve control. The second speaker will describe research on interoception and cardiovascular disorders from a computational perspective. The third speaker will describe one of the first efforts to experimentally test signatures of predictive coding in interoception, using a combination of EEG, ECG, behavior and computational modelling. The fourth speaker will present a computational perspective on the biopsychosocial model with an emphasis on the health benefits of social support, which provides a unifying framework for organically integrating causal mechanisms across domains. The discussant will focus on how computational neuroscience has potential paradigm-shifting implications for how investigators think about and execute research in psychosomatic medicine.

Individual Abstract Number: 1089

The role of somatic error in interoceptive psychopathology

Sahib S. Khalsa, MD, PhD, Laureate Institute for Brain Research, University of Tulsa, Tulsa, OK
Dysregulated interoceptive states are increasingly recognized as a prominent driver of mental illness. Interoceptive states are often distinguished by heightened physiological and psychological experiences, particularly when homeostatic deviations occur in response to threats—or potential threats—to the body. This talk will illustrate how mismatches between the current physiological state of an organism (as mapped in viscerosensory brain regions) and the predicted body state (as mapped in visceromotor regions) spark a regulatory battle for control in the central nervous system. The ensuing discrepancy between the predicted and current body state (i.e., the 'somatic error') signals a need for corrective action, motivating changes in both cognition and behavior. I will argue that mental health disorders are fundamentally driven by somatic errors that fail to be adaptively regulated, through disorder-specific alterations of active inference occurring across hierarchically based feedback and feedforward loops in the nervous system. According to this hypothesis, repeated failures to quell somatic error leaves the individual in a state of dissonance where the predicted body state is perpetually out of line with the current body state. The resulting distortion in perceptual mapping of the body manifests via symptoms of depression and anxiety, and can result in long-term changes in viscerosensory and visceromotor regions of the brain.This argument will be supported by empirical and clinical case studies with an emphasis on an 8-level neural hierarchy of vagus nerve control and the role adrenergic cardiovascular signaling to the brain. The role of somatic error in interoceptive psychopathology provides a potential mechanism for understanding a general process by which psychosomatic phenomena influence symptom expression in other conditions, such as functional disorders, somatization, and chronic pain.

Individual Abstract Number: 1094
Computational modelling of interoception offers fresh insight into psychological determinants of cardiovascular risk
Hugo D. Critchley, DPhil, Clinical Neuroscience and Neuroimaging, Brighton and Sussex Medical School, Brighton, United Kingdom
The allostatic control of the cardiovascular system adaptively supports immediate and anticipated behavioural demands. Interoception refers to the afferent signalling of internal bodily state and its representation and influence throughout the neuraxis (through to sensory perception). Interoceptive information, particularly from arterial baroreceptors, informs the basic baroreflex control of heart rate and blood pressure, underpinning cardiovascular health, yet it is also inextricably linked to motivational and emotional behaviours and associated affective feelings. Unpredicted changes in interoceptive information, which can arise through aberrant predictive precision and variance in afferent signalling, are important contributors to affective feelings, their emotional appraisal, and the behaviours that they engender. Contemporary predictive coding accounts of bodily regulation highlight how interoceptive prediction errors are minimised in part through actions that include autonomic drive to the heart and vessels. This efferent drive permits control through active inference about immediate physiological integrity. In this presentation, I link a neurobiological model of interoceptive representation and autonomic active inference to the embodied expression of emotion and psychosocial stress. I will illustrate, with reference to experimental studies, how these effects can lead mechanistically to increased cardiovascular risk and cardiac events.

Individual Abstract Number: 1232
Predicting our heart
Frederike Petzschner, PhD, Institute for Biomedical Engineering, ETH Zurich, Zurich, Switzerland
Perception has long been described as an inference process, one in which sensory inputs serve to continuously update an internal generative model of the environment, which serves as the basis for action selection. In a predictive coding framework, top-down predictions generated by an internal hierarchical model are constantly compared to bottom-up sensory inputs, the resulting difference, the prediction error, is then used as a weighted learning signal. The concept of predictive coding has recently been extended to describe inference about the current state of the body within its environment - a process termed interoception. However, experimental evidence for these computations is still rare. In the present work, we attempt to experimentally test signatures of predictive coding in interoception. In particular, I will present a series of experiments that provide evidence for interoceptive prediction errors with respect to heartbeats, using a combination of EEG, ECG, behavior and computational modelling.

Individual Abstract Number: 1129
An embodied neurocomputational framework for organically integrating biopsychosocial processes
Ryan S. Smith, PhD, Psychiatry, Laureate Institute for Brain Research, Tulsa, OK
Two distinct perspectives – typically referred to as the biopsychosocial and biomedical models – currently guide clinical practice. While the role of psychosocial factors in contributing to physical and mental health outcomes is widely recognized, the biomedical model remains dominant. The basic thesis of this talk is that by identifying the neural underpinnings of psychological and social processes, and their inherent linkage to bodily physiology, as specified by computational neuroscience, the biopsychosocial model can be translated into biomedical terms and thereby become more accessible to clinicians who adopt a biomedical perspective. This talk will first review recent advances in embodied cognition and predictive processing within computational neuroscience, which offer novel mechanisms for understanding individual differences in social perceptions, visceral responses, health-related behaviors, and their interactions. The talk will then illustrate how, when integrated, these advances highlight multiple mechanistic causal pathways between psychosocial and biological variables. The model that emerges from these considerations has important implications motivating a more psychologically sophisticated, person-specific approach to future research and clinical application in the biopsychosocial domain. It also highlights the potential for quantitative computational modeling of psychosomatic processes and the design of novel interventions. Finally, it should aid in guiding future research in a manner capable of addressing the current criticisms/limitations of the biopsychosocial model (insufficient mechanistic focus, inability to guide clinical intervention), and may therefore represent an important step in bridging the gap between it and the biomedical perspective.

Symposium 1101
Saturday, March 9 from 12:15 to 1:30 pm

Mindfulness and Cardiovascular Health: Outcomes, Mechanisms & Individual Differences
Jeffrey Greeson, PhD, Psychology, Rowan University, Glassboro, NJ, William Nardi, BSc, Behavioral and Social Sciences, Brown University School of Public Health, Providence, RI, Gabrielle Chin, AB, Psychology, Rowan University, Glassboro, NJ, Jeffrey Greeson, PhD, Psychology, Rowan University, Glassboro, NJ, Susan A. Everson-Rose, PhD, Medicine, University of Minnesota Medical School, Minneapolis, MN, Maria Llabre, PhD, Psychology, University of Miami, Coral Gables, FL

Despite best practices for prevention and treatment, cardiovascular disease (CVD) remains the leading cause of death in America. Stress is known to affect myriad risk factors for developing hypertension (HTN) and CVD, from biological mechanisms like stress reactivity, to health behaviors including diet, exercise, sleep, and adherence to medical regimens. This symposium will focus on mindfulness as an innovative approach to cardiovascular health, including preventing and treating high blood pressure and CVD. Two speakers will present correlational data linking trait mindfulness with resting BP and biological responses to stress, including cardiovascular, neuroendocrine, and immune reactivity. These presentations advance the science of mindfulness and cardiovascular health by testing relationships between self-report measures of mindfulness, including specific 'facets' of mindfulness like non-reactivity, with objective, clinically relevant health measures, including BP, BP reactivity to stress, stress hormones, and systemic inflammation. The other two speakers will present new data from recently completed intervention development studies. In these two randomized clinical trials, mindfulness programs were specifically tailored to meet the needs of patients with established high BP or cardiac disease. The clinical intervention studies will provide valuable information on the feasibility, acceptability, and initial effectiveness of mindfulness programs specifically designed to promote cardiovascular health and prevent progression of CVD. Together, these four presentations broach a number of important theoretical, methodological, and intervention design and implementation issues that will be of interest to researchers and clinicians alike. Following the empirical presentations, our Discussant will share her expert reflections and situate the current findings in the broader context of cardiovascular behavioral medicine, diversity and cultural sensitivity, and research design and analysis. This symposium is directly related to the theme "From Body to Mind." Mindfulness centers on self-awareness and self-regulation, thereby empowering individuals to keenly sense and respond to their body, whether hunger, thirst, fatigue, the need for movement, or the need to better manage stress or uplift mood – all in the service of using the mind-body connection for better health.

Individual Abstract Number: 1103

Mindfulness and Cardiovascular Health: Qualitative Mechanism Evidence

William Nardi, BSc, Behavioral and Social Sciences, Brown University School of Public Health, Providence, RI, Eric B. Loucks, PhD, Epidemiology, Brown University, Providence, RI

BACKGROUND: Mindfulness-based interventions (MBIs) hold promise for improving cardiovascular health (e.g. physical activity, diet, blood pressure). However, despite theoretical frameworks proposed, no studies have reported qualitative findings on how MBI study participants actually feel MBIs improved their cardiovascular health. The explanatory nature of qualitative methods allows them to contribute to in-depth investigations of mechanisms beyond *a priori*hypotheses. The objective was to qualitatively evaluate mechanisms by which the MBI, Mindfulness-Based Blood Pressure Reduction (MB-BP), may influence cardiovascular health.
METHODS: This was a Stage 1 single arm trial with one-year follow-up. MB-BP curriculum was adapted from Mindfulness-Based Stress Reduction to direct participants' mindfulness skills towards modifiable determinants of blood pressure. Nineteen participants engaged in focus group discussions, and 7 additional participants underwent in-depth interviews. All data were double coded. Themes were identified using structural coding based in self-regulation and mindfulness theory.
RESULTS: Participants identified self-awareness, attention control, and emotional regulation as key mechanisms that led to improvements in cardiovascular health. Participants detailed a stepwise process beginning with increased self-awareness that allowed them to sustain attention, and regulate emotions. Many also explained that the specific relationship between self-awareness and emotional regulation enabled them to mitigate responding to stressors negatively. In a secondary sub-theme, participants suggested that higher self-awareness allowed them to choose to engage in positive health behaviors (e.g. physical activity, healthier dietary choices). However, some participants expressed concern that in becoming more self-aware, they saw increasing stress around instances of higher blood pressure readings, leading to self-judgement.
CONCLUSION: Qualitative analyses suggest the practices learned in MB-BP taught participants to better engage in self-regulation skills and behaviors to lower cardiovascular disease risk, which supports recent theory. These results are consistent with quantitative mechanistic findings showing emotion regulation, perceived stress, interoceptive awareness, and attention control influenced by MB-BP.

Individual Abstract Number: 1102

Does Trait Mindfulness Buffer Cardiovascular Risk? Baseline Analyses from the Serenity Study

Gabrielle Chin, AB, Jeffrey Greeson, Ph.D., Psychology, Rowan University, Glassboro, NJ, Vanessa Anyanso, B.A., Jonathan Reda, B.S., Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, Mary Keenan, B.A., Psychology, University of Memphis, Memphis, TN, Devin Barney, B.A., Psychology, University of Hawaii, Manoa, HI, Megan Strowger, M.A., Psychology, Kent State University, Kent, OH, Monica Fallon, M.A., Business School, University of Mannheim, Mannheim, Germany, Joel Hughes, Ph.D., David Fresco, Ph.D., Psychology, Kent State University, Kent, OH

Introduction. One in three American adults has hypertension, yet only 20% are able to control high blood pressure (BP) with typical treatments. Initial evidence suggests mindfulness *training* lowers BP, however, the relationship between *trait* mindfulness & BP is largely unknown.
Methods. Baseline data from an ongoing multisite trial (NCT02371317) were used to test associations between trait mindfulness, clinic BP, & BP reactivity to an anger recall stressor. The Five Facet Mindfulness Questionnaire measured core mindful qualities: Observing (OB), Describing (DE), Nonjudging (NJ), Nonreactivity (NR), & Acting with Awareness (AWA).
Results. Trait mindfulness did not correlate with clinic BP in the full sample (n=258). Differential effects emerged across demographics. In Whites (n=169) high NJ (r(169)=.195) & AWA (r(169)=.168) correlated with high SBP at low effect size (ES). Correlations in Blacks (n=61) were null. In young (n=50) participants, high NJ (r(50)=.302) correlated with high SBP at medium ES. In middle age (n=127) participants, high NJ (r(127)=.206) correlated with high SBP at small ES. Correlations between mindfulness facets & clinic BP were null in older participants (n=58). Correlations in female participants (n=134) had null ES. In males (n=107), high NJ (r(107)=.265) & AWA (r(107)=.230) correlated with high SBP at approaching medium ES. Regarding stress testing, mindfulness facets did not correlate with BP *reactivity* in the full sample. Differential effects again emerged across demographics. Correlations in Whites (n=64) were null. In Blacks (n=23), high NJ (r(*23*) = -.298) & NR (r(*23*) = -.295) correlated with low SBP reactivity at medium ES. Correlations in males (n=47), females (n=44), & young participants (n=24) were null. In middle age subjects (n=38), five of six facets [OB (r(*38*) = -.252), DE (r(*38*) = -.425), AWA (r(*38*) = -.314), NR (r(*38*) = -.328), & Decentering (r(*38*) = -.301)] negatively correlated

with SBP reactivity at medium ES. In older participants (n=26), correlations were null.
Conclusions. Most facets of mindfulness did not correlate with clinic BP, however, effects differed by demographics, & some were counter-intuitive. High scores on some facets associated with low BP *reactivity*in Black, middle-age, & female participants, suggesting a potential buffering effect among groups most vulnerable to stress.

Individual Abstract Number: 1105
Moderating Effects of Trait Mindfulness & Compassion on Biological Responses to Emotional Stress: Implications for CVD Risk
Jeffrey Greeson, PhD, Psychology, Rowan University, Glassboro, NJ
Background. Amidst burgeoning clinical research on mindfulness-based interventions for stress-related disorders, including high blood pressure (BP) and cardiovascular disease (CVD), research on the protective effect of dispositional (trait) mindfulness is less well developed. Moreover, mindfulness is a multifaceted construct, comprised of several core qualities, including Observing one's present-moment experience, Describing or labeling one's experience with words, Non-judging, Non-reactivity, Acting with Awareness, and Self-Compassion. Very little work to date has examined whether facets of trait mindfulness moderate physiological responses to stress, as a self-regulatory mechanism of minimizing allostatic load, and possibly preventing high BP and CVD. **Methods.** Cross-sectional analysis of baseline data (n=64, age 22-64, 67% F, 84% white) from a recent open trial of Mindfulness-Based Stress Reduction (NCT01343810). Repeated measures ANOVA was used to compare stress response profiles (heart rate [HR], blood pressure [BP], epinephrine [EPI], norepinephrine [NE], dopamine [DA], and interleukin [IL]-6) as a function of high/medium/low (tertile) mindfulness and compassion scores. **Results.** None of the mindfulness or compassion scores moderated HR or BP responses to stress. However, a number of significant moderating effects were found across the catecholamines and IL-6. For example, Observing (p=.049), Describing (p=.029), and Acting with Awareness (p=.012) all moderated DA responses to stress, with different patterns of responses found depending on the specific facet of mindfulness. Total mindfulness (p=.004), as well as Observing (p=.006), Describing (p<.001), and Self-Compassion (p=.022), significantly moderated EPI responses to stress, again with different effects depending on the specific facet. Finally, total mindfulness (p=.056), Non-judging (p=.022), and Non-reactivity (p=.030) were all associated with differential IL-6 responses. **Conclusions.** These findings provide the first evidence to our knowledge that several distinct, core qualities of mindfulness can explain individual variability in stress responses across different biological systems implicated in the risk of chronic inflammatory diseases, like CVD. The link between trait mindfulness and cardiovascular reactivity, however, may not be apparent in healthy adults with normal BP.

Individual Abstract Number: 1104
The Mindful Heart Study: Results From A Pilot Randomized Controlled Trial Of Mindfulness-Based Stress Reduction For Cardiac Patients
Susan A. Everson-Rose, PhD, Medicine, Prabhjot S. Nijjar, MD, Cardiology, University of Minnesota Medical School, Minneapolis, MN, Ruth Lindquist, PhD, Mary Jo Kreitzer, PhD, Nursing, University of Minnesota School of Nursing, Minneapolis, MN, John E. Connett, PhD, Roland Z. Brown, BS, Biostatistics, University of Minnesota School of Public Health, Minneapolis, MN, Aaron Pergolski, MA, Marsha Burt, MS, Cardiopulmonary Rehabilitation, Fairview Health Services, Minneapolis, MN, Priya Balaji, BS, Alexandra Wolfe, BS, Nitya Chandiramani, BA, Xiaohui Yu, BSN, Medicine, University of Minnesota Medical School, Minneapolis, MN
BACKGROUND: Secondary prevention strategies are crucial for millions who experience myocardial infarction, heart failure, and interventional cardiac procedures each year. Exercise-based cardiac rehab (CR) is the standard of care but is underutilized and has mixed evidence of clinical benefit. Mindfulness-based stress reduction (MBSR), which includes meditation, yoga, and breathing practices, is a secondary prevention strategy that may have psychosocial and cardiovascular (CV) benefits. Few studies have rigorously evaluated MBSR in cardiac patients. **METHODS:** The Mindful Heart Study (ClinicalTrials.gov #NCT02722213) was a pilot RCT of MBSR in CR-eligible cardiac patients during their initial recovery year. Goals were to test recruitment and retention strategies, safety of MBSR, and to estimate treatment effects on psychosocial measures, CV risk factors, heart rate variability and health-related quality of life (HRQOL). Patients were recruited from a university-affiliated hospital system, stratified by current CR enrollment (yes/no), and randomly allocated 2:1 (intervention:control) to an 8-week MBSR group intervention or usual care. Standard measures of depression, anxiety, perceived stress, HRQOL, blood pressure, lipids, HbA1c, CRP and 24-hour Holter monitoring were obtained at baseline and 3- and 9-months post-randomization. **RESULTS:** A total of 47 patients [mean (SD) age, 58.6 (10.8) years; 38% female; 77% white] were enrolled in 2 cohorts over 15 weeks. Two 8-week MBSR groups were completed; 87% of MBSR patients completed the intervention. All MBSR patients reported high satisfaction with the intervention and improved stress coping. Study retention was >95% at each follow-up visit. At 3 months, MBSR patients showed significant improvements relative to controls in depression [adjusted difference (95% CI), -2.69 (-4.70, -0.68) p=.01] and anxiety [-2.75 (-5.37, -0.13) p=.04] with a similar trend in HRQOL [-3.93 (-8.04, 0.17) p=.06], but did not differ on CV risk factors. At 9 months the MBSR group showed greater improvement or less worsening of most CV risk factors. **CONCLUSIONS:** This pilot RCT provides preliminary evidence of MBSR's potential to improve psychosocial well-being in cardiac patients during their first year of recovery. A fully-powered RCT is planned to evaluate effects of MBSR on mental health and CV risk factors in a diverse patient population.

Symposium 1116
Friday, March 8 from 4:10 to 5:25 pm

Race/ethnicity and the effect of protective factors and risk factors on health: "Diminishing returns" in maternal-child health
Kharah M. Ross, PhD, Alberta Children's Hospital Research Institute, University of Calgary, Calgary, AB, Canada, Anna M. Strahm, MS, Psychology, North Dakota State University, Fargo, ND, Kharah M. Ross, PhD, Alberta Children's Hospital Research Institute, University of Calgary, Calgary, AB, Canada, Lisa M. Christian, PhD, Psychiatry & Behavioral Health, The Ohio State University, Columbus, OH, Guido Urizar, PhD, Psychology, California State University, Long Beach, CA
"Diminishing returns" is a phenomenon by which racial/ethnic health disparities could in part be driven by unequal exposure to risk and/or access to resources across racial/ethnic groups. Evidence from Public Health and Sociology suggests that protective factors, i.e. education or social support, could be less available and/or health beneficial for Black individuals compared to White. And risk factors, e.g. poor sleep, depression, and stress, could be more present and/or health detrimental for Black individuals compared to White. Although the "diminishing returns" phenomenon has important implications for understanding racial/ethnic health disparities, and clinical practices and interventions designed to address those disparities, "diminishing

returns" is under recognized and under studied in the psychological and health sciences. **The primary purpose of this symposium is to highlight the problem of "diminishing returns," focusing on examples from maternal-child health**. In addition, "diminishing returns" is primarily studied in the context of Black individuals. Relatively little is known about whether "diminishing returns" is also evident for other racial/ethnic and cultural contexts, or whether the phenomenon is driven by similar processes across contexts. **A second purpose of this symposium is to showcase work that explores "diminishing returns" in a range of racial/ethnic contexts.** One study shows that anxiety and depression had worse implications for blood pressure during pregnancy among *Black*compared to White women, which could affect adverse pregnancy outcome risk. Another shows that higher education provides less protection for *Indigenous* women with respect to length of pregnancy, compared to White. A third explores the effect of poor sleep and depression on preterm birth risk, and shows that these risk factors impact *Black* women more than White. And another shows that a pregnancy stress reduction intervention was less effective for *Latina*mothers and infants, with respect to postpartum cortisol indices, compared to White mothers and infants. Collectively, these studies highlight the complexities of racial/ethnic health disparities, and the importance of awareness of and research on "diminishing returns" in the psychological and health sciences.

Individual Abstract Number: 1429

Racial Differences in Blood Pressure Sensitivity to Psychosocial Factors During Pregnancy

Anna M. Strahm, MS, Clayton J. Hilmert, PhD, Psychology, North Dakota State University, Fargo, ND, Calvin Hobel, MD, OB/GYN-Maternal Fetal Medicine, Cedars-Sinai Medical Center, Los Angeles, CA, Chris Dunkel Schetter, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA

Differences in the psychophysiological experience of stress may help explain the severe pregnancy health disparities found between Blacks and Whites in America. The purpose of this presentation is to examine associations between blood pressure (BP) and stress, anxiety, social support, and depression at multiple times over the course of pregnancy among Blacks and Whites, focussing on the timing of stress and its impact on BP in each group.

Participants were Black (n=55) and non-Hispanic White (n=131) women recruited in the first trimester of pregnancy. Interviews were conducted and BP was assessed up to five times during pregnancy, and at 6 to 12 weeks postpartum. Consistent with past findings by Hilmert et al. (2008), significant interactions revealed that Blacks had stronger associations between psychosocial factors and BP than did Whites. Independent analyses of time periods revealed that this interaction existed in mid pregnancy (18-20 weeks, ß=.87, p =.046; 24-26 weeks, ß=.81, p = .047) but not late pregnancy (30-32 weeks, ß=.71, p = .087; ≥38 weeks, ß=.18, p>.10). During mid-pregnancy (18-20 and 20-24 weeks) Black women's diastolic BP was strongly associated with pregnancy anxiety (rs=.26,.31), general anxiety (rs=.28,.28), depression (rs=.32.36), and social support (rs=-.35,-.28). These associations were not significant for White women (all rs=-.19 to .19). There were no significant associations of BP with psychosocial factors at the earliest timepoint in pregnancy (<17 weeks) or postpartum suggesting that psychophysiological alterations of mid-pregnancy may make Black women more susceptible to these associations.

In the present study, as pregnancy progressed psychosocial factors were associated with BP but more strongly for Blacks than whites as evidenced by significant psychosocial by race interactions that grew stronger and then diminished. Thus there may be a critical period mid-pregnancy during which psychosocial factors contribute to racial disparities. These findings are consistent with prior research showing that environmental stress experienced prior to 32 weeks gestation, but not after, is associated with shorter gestational length and lower birthweight babies. It is possible that experiences prior to pregnancy predispose Black women to these psychosocial associations with BP, which may increase risk of adverse pregnancy outcomes.

Individual Abstract Number: 1187

Socioeconomic status and gestational length in Indigenous and White women: Evidence for "Widening Health Disparities"

Kharah M. Ross, PhD, Alberta Children's Hospital Research Institute, University of Calgary, Calgary, AB, Canada, Rebecca Baer, PhD, Department of Pediatrics, University of California - San Diego, San Diego, CA, Molly Altman, PhD, Nursing, University of Washington, Seattle, WA, Laura Jelliffe-Pawlowski, PhD, Epidemiology and Biostatistics, University of Los Angeles - San Francisco, San Francisco, CA

Although disparities in preterm birth have been well-studied among Black compared to White women, less is known about such disparities among Indigenous women. It is also unknown if differences in gestational length among White and Indigenous women are driven by similar socioecological processes. For example, "widening health disparities" is a phenomenon whereby higher socioeconomic status (SES) does not necessarily protect against shorter gestational length among racial/ethnic minority women, likely driven by e.g. historical discrimination and structural racism. Whether "widening health disparities" is apparent for Indigenous women and gestational length, compared to White women, is not known.

Objective: To test associations between race/ethnicity (Indigenous, White), SES (education, insurance status), and their interaction with gestation length.

Methods: The sample was drawn from a California population-based birth cohort (White: N=605,753; Indigenous: N=10,630). Women had infants free of chromosomal or structural abnormalities, were 18-55 years old, and had pre-pregnancy body mass index (BMI) of 19-45kg/m^2. Education was defined as level of education completed (no formal education to doctorate). Insurance status was defined as enrollment in California's low-income health insurance (Medi-Cal) or not. An interaction term was calculated for race/ethnicity and both SES indicators. Covariates were pre-pregnancy BMI, age, prenatal care commencement, parity, and smoking.

Results: In linear regression models, Indigenous women had shorter gestational length relative to White women. Having less education or MediCal enrollment also predicted shorter gestational length. A significant interaction emerged for education, *b(SE)*=-.106(.019), *p*b(SE)=.089(.003), *p*b(SE)=-.017(.019), *p*=.376. The race/ethnicity-by-insurance status interaction was not significant, *p*=.283.

Conclusions: Among Indigenous women, no protective effect of higher education was observed for gestational length, consistent with "widening health disparities." These findings highlight the unique challenges faced by Indigenous women, and the importance of studying health disparities at the intersection of race/ethnicity and SES.

Individual Abstract Number: 1117

Maternal Sleep, Depressive Symptoms, and Risk for Spontaneous Early Birth: Implications for Racial Disparities in Birth Outcomes

Lisa M. Christian, PhD, Psychiatry & Behavioral Health, Shannon Webber, BS, Medicine, Shannon L. Gillespie, PhD, Nursing, Kyle Porter, MAS, Center for Biostatistics, The Ohio State University, Columbus, OH

Delivery prior to full term (1,000,000 early term births (ETB; 37-38 weeks). Approximately 70% of cases of shortened gestation are spontaneous - without medically-indicated cause. Remarkably unpredictable, the two strongest risk factors are prior history of shortened gestation and African American race. Elucidation of modifiable behavioral factors would have considerable clinical impact. The current study examined the role of both depressive symptoms and poor sleep in risk for spontaneous shortened gestation (inclusive of ETB and PTB) in a racially diverse sample. This study included 317 women (135 Black, 182 White) who completed the Center for Epidemiologic Studies-Depression Scale (CES-D) and Pittsburgh Sleep Quality Index (PSQI) in mid-pregnancy. Length of gestation and etiology of early birth was determined via medical record review. Medically-indicated cases were excluded from analyses. **Results:** African American women had 2.35 times higher odds of spontaneous early term delivery compared to White women (odds ratio (OR) 95% CI = 1.34, 4.11). Logistic regression analyses adjusting for race, income, pre-pregnancy BMI, and maternal age demonstrated that women with only elevated depressive symptoms (CES-D $\geq$ 16) or poor sleep (PSQI $\geq$ 9) did not have significantly increased risk for shortened gestation (ps = 0.23 and 0.89, respectively). However, women with both risk factors exhibited 3.15 times higher odds of shortened gestation compared to those with neither risk factor (p = 0.01). In addition, African American women were more likely to experience both risk factors than were Whites (15.6% versus 6.6%). **Conclusion:** Controlling for race and other key covariates, additive effects of poor sleep and depressive symptoms are observed whereby higher risk for spontaneous shortened gestation were significant only among those with both risk factors. Racial disparities in rates of comorbid exposure corresponded with disparities in shortened gestation. Future empirical studies and intervention efforts should consider the interactive effects of these commonly co-morbid exposures.

Individual Abstract Number: 1463

Stress Management Intervention Effects on Cortisol Patterns among Latina and Non-Latina Mothers and their Infants

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Altered cortisol patterns during the postpartum period may lead to significant long-term health problems for low-income mothers and their infants. Yet, few studies have examined how to regulate cortisol in this population. The current randomized trial examined the impact of a prenatal cognitive behavioral stress management (CBSM) intervention on regulating postpartum cortisol levels among 82 low-income, Latina and non-Latina mothers (mean age=27$\pm$6 years; 75% annual income<$19K; 71% Latina) and their infants. During their first trimester of pregnancy, mothers were randomized to either an eight-week CBSM intervention or an attention-control (AC) group. Women in the CBSM intervention (n=43) attended eight weekly group-based sessions in which a clinically trained researcher taught relaxation and coping skills, whereas women in the AC group (n=39) received eight weekly print-based prenatal health information pamphlets by mail. At three months postpartum, mothers' diurnal cortisol levels were estimated from seven saliva samples provided on one collection day (four morning samples, 12pm, 4pm, and 8pm). Infants' diurnal cortisol levels were estimated from two saliva samples (8am and 8pm) provided on the same collection day as their mothers. Results showed that non-Latina mothers (62% African-American) in CBSM had lower morning cortisol at three months postpartum than mothers in the AC group [F (4, 78) = 4.3, p = .041]. Furthermore, infants of non-Latina mothers in CBSM showed a steeper decrease in their cortisol levels across the day than infants of mothers in the AC group [F (4, 68) = 6.0, p = .017]. No randomization group differences (CBSM vs. AC group) were found on the cortisol levels of Latina mothers or their infants. These findings demonstrate the long-term impact that prenatal CBSM interventions can have in regulating postpartum cortisol levels among at-risk non-Latina mothers and their infants and highlight the need to further test and culturally tailor these interventions for Latinas.

Symposium 1139
Thursday, March 7 from 1:15 to 2:15 pm

Early life microbiome and child health

Gerald Giesbrecht, PhD, Pediatrics, University of Calgary, Calgary, AB, Canada, Alexander L. Carlson, B.S., Psychiatry, University of North Carolina at Chapel Hill, Chapel Hill, NC, Yanan Wang, Ph.D., Pediatrics, University of Calgary, Calgary, AB, Canada, Hind Sbihi, Ph.D., Pediatrics, University of British Columbia, Vancouver, BC, Canada, Emily B. Hollister, Ph.D., Department of Pathology & Immunology, Baylor College of Medicine, Houston, TX

The human gut is colonized by trillions of bacteria that are increasingly recognized as key contributors to child development. Gut bacteria perform vital functions essential to health, including protection from enteropathogens and synthesizing and extracting nutrients from diet. Animal and human studies suggest that gut microbiota play a role in a variety of psychosomatic illnesses, including asthma and irritable bowel syndrome and psychological illnesses, such as anxiety and depression. Nevertheless, there is a paucity of studies in children. This is an important gap because the early life microbiome is postulated to have highly potent effects on children's development. Furthermore, there are important compositional and functional differences between the microbiomes of children and adults, indicating the importance of studying children. This symposium will present emerging evidence of links between the early life gut microbiome and child health outcomes. The talks span the early years from neonates to pre-adolescents. The first talk (Carlson et al.) will describe associations between gut microbiota in neonates with their brain (MRI) and behavioral fear responses at 1 year of age. The second talk (Giesbrecht et al.) echoes these themes in preschool children, examining associations between gut microbiota and brain (fMRI) and behavior related to internalizing problems. The third talk (Sbihi & Boutin et al.) will also focus on preschoolers, examining the longitudinal associations between gut microbiota in the first year and asthma outcomes at age 5. The last talk (Hollister et al., presented by Shulman) will examine associations between gut microbiota and irritable bowel syndrome in pre-adolescent children. Together, these talks provide new insights into the potential role of the early life microbiome in children's development.

Individual Abstract Number: 1195

Infant Gut Microbiome Associated with Anxious Behavior and Neurocircuitry of Fear

Alexander L. Carlson, B.S., Kai Xia, PhD, Psychiatry, M. Andrea Azcarate-Peril, PhD, Medicine, Cathi B. Propper, PhD, Center for Developmental Science, Karen Grewen, PhD, Psychiatry, Amanda Thompson, PhD, Nutrition, Martin Styner, PhD, Computer Science,

University of North Carolina at Chapel Hill, Chapel Hill, NC, Rebecca C. Knickmeyer, PhD, Pediatrics and Human Development, Michigan State University, East Lansing, MI
Background: Understanding the role of microbial communities in the gut as a component of the microbiome-gut-brain axis has the potential to yield promising new strategies to support human neurodevelopment and minimize neuropsychiatric disease outcomes. Studies in animal models have shown that experimental manipulation of gut microbes impacts brain development and anxious behavior. Preclinical studies also provide evidence for a critical window in early development during which gut microbiota exert influence over neurodevelopment processes. However, it is currently unknown if gut microbiota similarly impact brain development and behavior in humans infants during this critical period.
Methods: Infants were recruited from central North Carolina hospitals as part of a longitudinal cohort pilot study. Participants were included in the study if vaginally delivered, exclusively breast-fed, and antibiotic naïve at visit 1 (n=35). Participants had two study visits for biosample collection and brain MRI (median age visit 1 = 30 days, median age visit 2 = 379 days). Fecal samples were collected at each visit for 16S ribosomal RNA amplicon sequencing for identification and relative quantification of bacterial taxa. Assessments of non-social fear were completed at visit 2 via the Mask Task portion of the locomotor Laboratory Temperament Assessment Battery.
Results: 1-year gut microbiome composition (first principle component of weighted Unifrac distances) was significantly associated with Mask Task non-social fear outcomes of facial fear, bodily fear, vocal distress, and escape behavior in response to mask presentation. Infants characterized by higher abundance of *Bacteroides* at 1 year were less fearful in behavioral measures. The same component was also significantly associated with amygdala volume at 1 year where infants with higher abundance of *Bacteroides* had smaller amygdala volumes.
Conclusion: This is the first study to demonstrate associations between the infant gut microbiome and fear behavior as well as underlying neurobiological substrates of fear circuitry. This represents an important step in understanding the role of the gut microbiome in the development of human fear behaviors.

Individual Abstract Number: 1292

Associations between gut microbiota and internalizing problems in preschoolers

Yanan Wang, Ph.D., Pediatrics, Dimitrii Paniukov, PhD, Radiology, Matthew Workentine, Ph.D., Faculty of Veterinary Medicine, Dominique Drouin, BSc, Community Health Sciences, Carly McMorris, Ph.D., Assistant Professor, University of Calgary, Calgary, AB, Canada, Catherine Lebel, Ph.D., Radiology, University of Calgary, University of Calgary, AB, Canada, Raylene Reimer, Ph.D., Faculty of Kinesiology, Gerald Giesbrecht, Ph.D., Pediatrics, University of Calgary, Calgary, AB, Canada
Background: Animal studies, and adult human studies, have shown that gut microbiota-to-brain signaling is an important mechanism shaping the psychological and physiological processes at the core of internalizing (INT) disorders, such as anxiety and depression. However, there are no studies in children. Our objective was to evaluate associations between gut microbiota and psychological and physiological aspects of INT symptoms in children.
Methods: Stool samples collected from 253 four-year-old children in the Alberta Pregnancy Outcomes and Nutrition (APrON) study were assayed using 16S rRNA Illumina sequencing for identification and relative quantification of bacterial taxa. Parents reported on INT symptoms using the Child Behavior Checklist (CBCL). Resting state functional MRI (fMRI) imaging was completed in a subset of 14 children to determine whether connectivity between the amygdala and prefrontal cortex (PFC) regions (known to be associated with INT) was associated with fecal microbiota.
Results: Beta diversity revealed 3 distinct clusters of microbiota (Figure 1). Sex-specific associations were observed between cluster and INT – females in Cluster 1 had significantly higher INT scores. Strength of amygdala-PFC connectivity differed as a function of microbiota community composition with Cluster 2 showing a strong positive connectivity, and Cluster 3 negative connectivity. Cluster 1 had moderate positive connectivity. Because of sample size we did not assess sex differences in amygdala-PFC connectivity, but added sex as a covariate.
Conclusion: The finding suggest that the composition of gut microbiota is associated with psychological and physiological indicators of INT problems. It is well-known that connectivity between the amygdala and PFC decreases with age, leading us to speculate that the gut microbiota may contribute to a maturational gradient. Cluster differences in our analysis are not likely due to age, which we controlled for statistically. It is known that premature development of amygdala-PFC connectivity toward an adult-like profile has negative implications for INT problems – our findings suggest that gut microbiota may be involved, but should be confirmed with a larger sample size.

Individual Abstract Number: 1287

The infant gut microbiome: a common means by which environmental factors affect asthma outcomes?

Hind Sbihi, Ph.D., Pediatrics, Rozlyn Boutin, BSCH, Microbiology & Immunology/Michael Smith Laboratories, Charisse Petersen, Ph.D., Michael Smith Laboratories, Chelsea J. Cutler, B.Sc., Microbiology & Immunology, University of British Columbia, Vancouver, BC, Canada, Malcolm R. Sears, MB, ChB, Medicine, McMaster University, Hamilton, ON, Canada, Padmaja Subbarao, MD, MSc, FRCP, Theo J. Moraes, MD, PhD, FRCPC, Pediatrics, University of Toronto, Toronto, ON, Canada, Allan B. Becker, MD, FRCPC, Meghan B. Azad, Ph.D., Pediatrics & Child Health, University of Manitoba, Winnipeg, MB, Canada, Piush J. Mandhane, MD, PhD, FRCPC, Pediatrics, University of Alberta, Edmonton, AB, Canada, Brett Finlay, Ph.D., Microbiology & Immunology/Biochemistry, UBC/Michael Smith Laboratories, Vancouver, BC, Canada, Stuart E. Turvey, MBBS DPhil, Pediatrics, University of British Columbia, Vancouver, BC, Canada
Background: Global asthma prevalence has risen rapidly in recent decades, disproportionately affecting developed countries and implicating environmental causes. Evidence suggests that the infant gut microbiota, a highly dynamic and impressionable ecosystem of microbes responsive to environmental exposures, plays an important role in immune development relevant to asthma. However, the relationships between a broad range of environmental exposures to asthma-associated gut microbiome compositions have not been well defined.
Methods: To identify early life environmental exposures associated with gut microbiome features linked with childhood asthma outcomes, we used mixed model regression to examine data collected from a subset (n=917) of children in the Canadian Healthy Infant Longitudinal Development (CHILD) birth cohort study. DNA isolated from stool samples collected at 3 and 12 months of age was used to characterize bacterial communities of the gut microbiome using 16S rRNA sequencing technology. Asthma status at age 5 years and information on asthma risk factors were determined from physician reports and questionnaire data. Residential addresses were used to characterize variables associated with maternal built

environment, including satellite measure of greenness and land use regression model-derived estimates of maternal nitrogen dioxide traffic-related air pollution (TRAP) exposure.
Results: Increased prenatal TRAP exposure, first-born status, prenatal antibiotic exposure, and maternal atopy were associated with an increased risk of being diagnosed with asthma at age 5 (n=116, 11.6%). Infants diagnosed with asthma exhibited changes in the composition of their gut microbiota at 3 and 12 months of age. Notably, prenatal TRAP exposure was associated with changes in relative abundance of key asthma-associated bacterial taxa and significantly impacted beta-diversity of the gut microbiota. Prenatal TRAP exposure also negatively correlated with the rate of increase in alpha diversity of the gut microbiota observed between ages 3 and 12 months.
Conclusions: Similar to other established modifiable environmental risk factors for asthma, prenatal TRAP exposure has significant associations with asthma-associated features of the gut microbiota, suggesting a possible mechanism by which TRAP exposure influences asthma outcomes.

Individual Abstract Number: 1165
Microbial Multi-omics Differentiates Children with Irritable Bowel Syndrome from Healthy Control
Emily B. Hollister, Ph.D., Department of Pathology & Immunology, Numan Oezguen, Ph.D., Pathology, Bruno Chumpitazi, MD, Pediatrics, Ruth A. Luna, Ph.D., Pathology, Erica M. Weidler, MEd, Pediatrics, Michelle Rubio-Gonzales, BA, Pathology, Julia Cope, Ph.D., Microbiology and Virology, Toni-Ann Mistretta, Ph.D., Sabeen Raza, MSc, Pathology, Ginger Metcalf, BS, Donna M. Muzny, MS, Richard A. Gibbs, Ph.D., Human Genome Sequencing Center, Joseph Petrosino, Ph.D., Virology and Microbiology, Baylor College of Medicine, Houston, TX, Margaret Heitkemper, Ph.D., Nursing, University of Washington, Seattle, WA, Tor C. Savidge, Ph.D., Pathology, Robert Shulman, MD, Pediatrics, James Versalovic, MD, PhD, Pathology, Baylor College of Medicine, Houston, TX
Background: Our understanding of the complex relationship between the human gut microbiome and childhood irritable bowel syndrome (IBS) symptoms remains limited. We hypothesized that a multi-omic strategy would both differentiate children with IBS vs. healthy controls and identify microbial factors associated with childhood IBS abdominal pain frequency and severity.
Methods: We rigorously classified pre-adolescent children (7-12 years of age) as having Rome III IBS (n=23) or as healthy controls (n=22). Fecal microbial communities were characterized using whole genome shotgun metagenomics. Global fecal metabolomic profiling was completed via ultra-performance liquid chromatography tandem mass spectrometry (MS) and gas chromatography/MS. Correlation-based approaches and machine learning algorithms (Random Forest) identified features differentiating IBS cases from controls and characterized associations between microbes, metabolites, and pain. False discovery rate correction values of q
Results: IBS cases differed from controls with respect to key bacterial taxa (e.g., Flavonifractor plautiii and Lachnospiraceae bacterium 7_1_58FAA, $q<.05$), bacterial metabolic functions (e.g., carbohydrate metabolism, amino acid metabolism, $q<0.10$), and higher-order metabolites (e.g., secondary bile acids, sterols, and steroid-like compounds, $q\leq 0.05$). A Random Forest classifier built upon both bacterial and metabolic markers successfully distinguished IBS cases from controls (area under the curve: 0.92). We identified several significant associations ($q\leq0.05$) between abdominal pain frequency and microbes, microbial genes, and metabolites.
Conclusion: Intestinal microbes, microbial genes/pathways, and fecal metabolites distinguish children with IBS from healthy children. Furthermore, microbial multi-omic features appear to contribute to childhood IBS-associated pain. These findings may lead to new childhood IBS microbiome-based diagnostic and therapeutic strategies

Symposium 1141
Saturday, March 9 from 3:30 to 4:30 pm

Nutrition and mental health in children and youth
Gerald Giesbrecht, PhD, Pediatrics, University of Calgary, Calgary, AB, Canada, Jenna Thomas-Argyriou, MSc, Psychology, University of Calgary, Calgary, AB, Canada, Taban Salem, Ph.D., Department of Psychiatry and Behavioral Health, The Ohio State University, Columbus, OH, Jeanette Johnstone, Ph.D., Child & Adolescent Psychiatry, Oregon Health & Science University, Portland, OR, Paul Veugelers, PhD, School of Public Health, University of Alberta, Edmonton, AB, Canada
Mood and neurodevelopmental disorders are on the rise in children and are now the most prevalent disabilities among children in North America. Adults who had mood or neurodevelopmental disabilities as children have lower educational achievement, work less than adults who had chronic physical disabilities as children, and have greatly reduced yearly income compared to individuals with no disability – 3 times greater than the reduction associated with childhood physical health problems. These sobering facts underscore the importance of identifying plausible, accessible, and modifiable intervention targets to optimize children's mental health and neurodevelopmental outcomes.
In this symposium, we will examine evidence suggesting that early life nutrition may play a role in the amelioration of mood and neurodevelopmental disorders. Thomas-Argyriou et al. (Giesbrecht presenting) will present data on the role of maternal choline intake during pregnancy on physiological stress reactivity (cortisol) in 3-month-old infants. These data suggest that maternal nutrition (choline specifically) buffers stress responses among infants and thereby may prevent or reduce later neurodevelopmental or behavioral problems. Salem et al. will provide a detailed overview of studies on nutritional interventions for ameliorating mood symptoms in children and adolescents, with a specific focus on a recent RCT on omega-3 fatty acid supplementation in youth with mood disorders. Johnstone et al. will focus on the effects of broad spectrum micronutrient supplementation on mood and attention symptoms among disaster exposed youth. A discussion of the findings across these three presentations will be led by Dr. Paul Veugelers, Professor of nutrition and public health at the University of Alberta. Dr. Veugelers will address some of the 'big' questions in nutrition and mental health related to the relative merits and challenges of whole lifestyle interventions versus single or multi-nutrient interventions, the costs/benefits of whole population approaches versus targeted interventions, and the biological mechanism whereby nutrients may contribute to mental health/illness. In his discussion, Dr. Veugelers will also touch on his experiences with a school based program (APPLE Schools) that seeks to promote healthy lifestyles in children and youth.

Individual Abstract Number: 1164
Choline Intake During Pregnancy Buffers the Impact of Stress on Maternal and Infant Cortisol Reactivity
Jenna Thomas-Argyriou, MSc, Psychology, University of Calgary, Calgary, AB, Canada, Catherine Field, PhD, Agricultural Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada, Erin Lewis, PhD, USDA Jean Mayer Human Nutrition Research Center on Aging, Tufts University, Boston, MA, Niole Letourneau, PhD, Faculty of Nursing, Tavis Campbell, PhD, Psychology, Gerald

Giesbrecht, PhD, Pediatrics, University of Calgary, Calgary, AB, Canada
Background: The role of nutrition in regulating stress responses has been hypothesized (Monk et al 2012), and Jiang et al. (2012) found that choline alters placental function, with implications for both maternal and infant hypothalamic-pituitary-adrenal (HPA) axis. The aim of the current study was to determine whether maternal prenatal choline intake buffers the effects of stress on the maternal and/or infant HPA axis.
Methods: Participants were 236 mother-child dyads. During pregnancy, maternal choline intake was estimated by three 24-hour dietary recalls, maternal stress was assessed by self-report and cortisol was assayed from saliva collected in early (M=16 weeks) and late (M=32 weeks) pregnancy. At 3 months postnatal, infant cortisol reactivity was assessed by saliva samples at baseline and 20 min post laboratory stressor.
Results: Prenatal choline was not directly associated with maternal diurnal cortisol during pregnancy or infant cortisol reactivity postnatally. However, choline did moderate the association between exposure to stress and cortisol. In mothers, choline buffered the effects of early life adversity such that increased choline intake reduced the effects of adversity on the maternal cortisol awakening response, β=-.008, p=.03, and the effects of current stressors on the daytime slope, β=.001, p=.03. For infants, the effects of maternal choline depended on sex. There were significant and opposite interaction effects between prenatal choline intake and maternal cortisol levels to predict male, β = .0007, p = .002, and female, β = -.0005, p = .047, infant cortisol reactivity (Figure 1). When maternal choline intake was low, there was a positive association between maternal cortisol and infant cortisol reactivity for female infants, whereas there was a negative association for male infants. When maternal choline intake was high, male and female infant cortisol reactivity profiles became more similar regardless of maternal cortisol exposures during pregnancy.
Conclusion: Higher estimated prenatal choline intake reduced the impact of exposure to stress on the maternal HPA axis and there were sex differences in the way that choline buffers the effects of maternal cortisol on the infant HPA axis. Choline may represent a novel dietary factor to offset the impact of prenatal stress on the child development via changes to HPA axis function.

Individual Abstract Number: 1260
Nutritional and dietary interventions for mood disorders in youth
Taban Salem, Ph.D., Mary A. Fristad, Ph.D., L E. Arnold, MD, MEd, Department of Psychiatry and Behavioral Health, The Ohio State University, Columbus, OH
Background: Conventional treatments for mood disorders in youth have limited effectiveness, and pharmacotherapy can produce a range of side effects with negative health consequences. Increasing evidence suggests that the addition of nutritional interventions as an adjunct to mainstream treatments can reduce severity and chronicity of mood symptoms in youth and may help to lower the number and dosage of psychiatric medications needed.
Methods: A review of the literature on dietary and nutritional interventions for mood disorders in youth will be presented, including broad-spectrum micronutrient supplements, omega-3 fatty acids, and dietary changes. This review will include focused discussion of a recent randomized controlled trial (RCT) examining the benefits of omega-3 fatty acids alone or in combination with psychotherapy in a sample of youth with major depressive or bipolar spectrum disorders (BPSD).
Results: Diets high in vegetables and fruits and low in processed foods have been linked to better mental health in cross-sectional and prospective studies. A recent meta-analysis showed an inverse relationship between consumption of a Mediterranean diet and subsequent depression risk. No RCTs examining dietary changes as interventions for mood disorders have been carried out in youth, but a 12-week dietary intervention reduced depressive symptoms more than a matching social support protocol in depressed adults. In one RCT omega-3 fatty acids outperformed placebo in reducing symptoms of mania and depression in youth with BPSD, and another RCT found that omega-3s reduced behavioral and cognitive problems in youth with mood disorders. Case series and open-label trial results show benefits of broad-spectrum micronutrients for reducing manic and depressive symptoms in youth with mood disturbances.
Conclusions: Given the widespread use of nutritional and dietary interventions for mood disorders, it is important for professionals to be familiar with the literature regarding safety and efficacy of these treatments. Much more research is needed examining the therapeutic benefits and potential risks of nutritional supplements in youth, but early findings suggest they have potential to reduce mood symptoms, especially when combined with psychotherapy. Moreover, these interventions appear to be generally safe and well tolerated in children and adolescents.

Individual Abstract Number: 1261
Nutrient supplementation for irritability, inattention, and post-natural disaster stress in youth
Jeanette Johnstone, Ph.D., Child & Adolescent Psychiatry, Oregon Health & Science University, Portland, OR, Julia J. Rucklidge, Ph.D., Neville Blampied, Master of Science, Ellen Sole, Master of Arts, Department of Psychology, Heather Gordon, PhD, Psychology, University of Canterbury, Christchurch, New Zealand
Background: Attention Deficit Hyperactivity Disorder (ADHD) in youth is impairing, common, and often leads to poor long-term outcomes, even with standard treatment. Impairment and poor outcomes in these children are driven as much by emotion dysregulation and irritability as by the core characteristics of ADHD (inattention, impulsivity, and hyperactivity). Growing evidence suggests benefit for these impairing symptoms from broad spectrum micronutrient supplementation.
Methods: Research examining short term supplementation with micronutrients (vitamins and minerals) for mood, attention, and post-disaster stress in youth (7-12 years old) will be reviewed, including safety and tolerability of the supplement. Studies include randomized controlled trials (RCT), including one underway at present, and open-label data.
Results: In an RCT of children (n = 93) with ADHD and irritable mood, supplementation with micronutrients for 10 weeks improved clinical symptoms, compared to placebo. In blinded clinician ratings, 47% of those taking micronutrients were rated as treatment responders overall, compared to 28% on placebo (ES=0.46). Both clinicians and parents noted improvements in the children's emotion regulation and reductions in irritability and aggression (ES=0.46-0.66). In children with post-earthquake stress (n=14), micronutrient supplementation resulted in reduced stress and anxiety after eight weeks, as reported by clinicians, parents and the children themselves.
Conclusions: Micronutrient supplementation represents a modifiable treatment with some evidence of efficacy in treating attention, irritability and post-disaster stress. While more research is needed, particularly regarding the micronutrients' mechanisms of action, findings suggest micronutrients confer benefit, with few side effects, for a range of impairing symptoms. Moreover, they appear to be safe and well tolerated in children and adolescents.

Symposium 1155
Friday, March 8 from 1:30 to 2:45 pm

Biological Embedding of Early Life Adversity Across the Lifespan

Jennifer A. Sumner, PhD, Center for Behavioral Cardiovascular Health, Dept of Medicine, Division of Cardiology, Columbia University Medical Center, New York, NY, Shakira F. Suglia, ScD, Epidemiology, Emory University Rollins School of Public Health, Atlanta, GA, Maria E. Bleil, PhD, Family and Child Nursing, University of Washington, Seattle, WA, Jennifer A. Sumner, PhD, Center for Behavioral Cardiovascular Health, Dept of Medicine, Division of Cardiology, Columbia University Medical Center, New York, NY, Shakira F. Suglia, ScD, Epidemiology, Emory University Rollins School of Public Health, Atlanta, GA, Aoife O'Donovan, PhD, Psychiatry, University of California San Francisco, San Francisco, CA, Lisbeth Nielsen, PhD, Individual Behavioral Processes Branch, National Institute on Aging, Bethesda, MD

It has become increasingly clear over the last two decades that the mental and physical health disorders that onset over the lifespan often have their antecedents in early life experience. In particular, exposure to early life adversity (ELA)—experiences that represent a deviation from the expectable environment and require adaptation—has been associated with a wide range of deleterious consequences for emotional and physical health. Not only does exposure to ELA explain approximately 30% of the mental disorders that onset in childhood, adolescence, and adulthood in the United States population, but it is also linked to increased risk of a host of adult chronic diseases and premature mortality. Given the lifelong negative consequences of ELA, there has been interest in elucidating the mechanisms by which these experiences get "embedded under the skin" and have lasting effects on both mental and physical health. Such work has the potential to identify prevention targets in order to offset risk for mental disorders and chronic disease outcomes in vulnerable individuals.

This symposium features four research presentations that shed light on how ELA may become biologically embedded and contribute to poor mental and physical health outcomes. These presentations focus on a wide range of ELA experiences and how they relate to several biological metrics that can reflect altered physiology across body systems, including epigenetic (i.e., accelerated epigenetic age), inflammatory (i.e., C-reactive protein), stress-reactivity (i.e., IL-6 response to stress), and reproductive (i.e., pubertal timing, pubertal stage) markers. Furthermore, these projects take a life course perspective, studying these processes in children, adolescents, and adults. Implications of these indicators of disrupted physiology for mental and physical health will be highlighted as well, demonstrating the link from body to mind (and vice versa). The symposium will conclude with a discussion of future directions for research and clinical applications, led by a discussant with expertise in ELA and aging.

Individual Abstract Number: 1282

Do Early Life Adversity Exposures Predict Pubertal Timing?

Maria E. Bleil, PhD, Family and Child Nursing, University of Washington, Seattle, WA, Steven E. Gregorich, PhD, Medicine, Robert A. Hiatt, MD/PhD, Epidemiology & Biostatistics, University of California San Francisco, San Francisco, CA, Hailey B. Hagins, MSPH, Family & Child Nursing, University of Washington, Seattle, WA, Glenn I. Roisman, PhD, Psychology, University of Minnesota, Minneapolis, MN, Cathryn Booth-LaForce, PhD, Family & Child Nursing, University of Washington, Seattle, WA

Background: Evidence suggesting early life adversity (ELA) exposures have lasting effects on adulthood health has created intense interest in identifying the mechanisms that explain this link. In this context, the purpose of the current study was to characterize prospective relations between ELA indicators and pubertal timing, as earlier pubertal maturation itself has been shown to predict cardiovascular disease (CVD) risk factors, incident CVD/cancer, CVD/cancer-specific mortality, and all-cause mortality.

Methods: Subjects included 472 female participants in the NICHD Study of Early Child Care and Youth Development (SECCYD; 1991-2006), a prospective study of children followed from birth to age 15.5y. A path model examined 5 ELA indicators in relation to pubertal timing with simultaneous estimation of covariates (maternal menarcheal age, race/ethnicity) and candidate mediators representing pre-pubertal health factors (body mass index [BMI], sedentary behavior, mother-rated child health). The 5 ELA indicators included 1) childhood SES (composite: parental education and household income-to-needs ratio at 7 assessments, 1-60m); 2) mother-child attachment (proportion "secure" at 15, 24, and 36m); 3) maternal sensitivity (composite: observational ratings at 5 assessments, 1-60m); 4) father absence (proportion of time father not in the home at 15 assessments, 1-60m); and 5) negative life events (mother-reported life events at 54m). Pubertal timing was assessed by child/mother reports of child menarcheal age at annual physical health exams (9.5-15.5y).

Results: Predictors accounted for 21.5% of the variance in child menarcheal age. Among the 5 ELA predictors, only childhood SES predicted pubertal timing, with lower childhood SES related to younger child menarcheal age (β=-.199, $p<.01$). In addition, covariates, white (vs. non-white) race/ethnicity and older maternal menarcheal age, predicted older child menarcheal age (β=.101, $p<.05$ and β=.371, $p<.001$, respectively). Modeled indirect effects were nonsignificant suggesting effects of childhood SES on pubertal timing were not explained by pre-pubertal health factors.

Conclusion: Childhood SES emerged as the only ELA indicator to predict pubertal timing. Future directions include consideration of how SES-related impacts on pubertal development may explain known effects of earlier pubertal timing on adulthood health.

Individual Abstract Number: 1283

Early Experiences of Threat, Not Deprivation, Are Associated with Accelerated Biological Aging in Children and Adolescents

Jennifer A. Sumner, PhD, Center for Behavioral Cardiovascular Health, Dept of Medicine, Division of Cardiology, Columbia University Medical Center, New York, NY, Natalie L. Colich, PhD, Psychology, University of Washington, Seattle, WA, Monica Uddin, PhD, College of Public Health, University of South Florida, Tampa, FL, Don Armstrong, PhD, Psychology, University of Illinois at Urbana Champaign, Champaign, IL, Katie A. McLaughlin, PhD, Psychology, Harvard University, Cambridge, MA

Background: Recent conceptual models argue that early life adversity (ELA) accelerates development, which may contribute to poor mental and physical health outcomes. Evidence for accelerated development in youth comes from studies of telomere shortening or advanced pubertal development following circumscribed ELA experiences and neuroimaging studies of circuits involved in emotional processing. It remains unclear whether all ELA is associated with accelerated development across global metrics of biological aging or whether this pattern emerges following specific adversity types.

Methods: In a community-based sample of 247 children and adolescents aged 8-16 years with wide variability in ELA exposure, we evaluated the hypothesis that early environments characterized by threat, but not deprivation, would be associated with accelerated development across two global biological aging metrics: DNA methylation (DNAm) age and pubertal stage relative to chronological age. We also examined whether accelerated development explained associations of ELA with depressive symptoms and externalizing problems.

Results: Chronological age was positively correlated with DNAm age (r=.62, p<.0001) and Tanner stage (r=.79, p<.0001). Older DNAm age was also associated with higher Tanner stage (r=.52, p<.0001). Exposure to threat-related ELA (e.g., violence) was associated with accelerated DNAm age and advanced pubertal stage, but exposure to deprivation (e.g., neglect, food insecurity) was not. In models including both ELA types, threat-related ELA was uniquely associated with accelerated DNAm age ($ß$=0.18, p=.080) and advanced pubertal stage ($ß$=0.28, p=.002), whereas deprivation was uniquely associated with delayed pubertal stage ($ß$=-0.21, p=.022) (Figure 1). Older DNAm age was related to greater depressive symptoms ($ß$=0.16, p=.040), and a significant indirect effect of threat exposure on depressive symptoms was observed through DNAm age (indirect effect=0.045, 95% confidence interval: 0.001-0.125).
Conclusions: Early threat-related experiences are particularly associated with accelerated biological aging in youth, which may be a mechanism linking ELA with depressive symptoms.

Individual Abstract Number: 1284
Child Maltreatment and Inflamatory Response to Mental Stress
Shakira F. Suglia, ScD, Epidemiology, Emory University Rollins School of Public Health, Atlanta, GA, Shakia Hardy, PhD, Alison Cammack, PhD, Bradley Pearce, PhD, Amit Shah, MD, Epidemiology, J Douglas Bremner, MD, Psychiatry, Viola Vaccarino, MD, PhD, Epidemiology, Emory University, Atlanta, GA
Exposure to early life traumatic stress, including child abuse, is associated with several health outcomes through the life course and may be driven, in part, by inflammation-related processes. However, there are relatively few studies of inflammatory reactivity in response to acute social and/or cognitive stressors. We assessed relationships between retrospectively self-reported exposure to child abuse (emotional, physical, and sexual), as measured by the 75th percentile on the Early Trauma Inventory Self-Report Short Form, and inflammatory responses to mental stress in a population of adults (mean age=51 years) who recently had a myocardial infarction (N=268). Inflammation was assessed as blood IL-6 concentrations, which were measured prior to and following a standardized public speaking stress task. We used mixed linear regression models adjusting for cardiovascular disease severity, medication usage and psychosocial, demographic and lifestyle factors. Each of the three abuse exposures were modeled individually and models were stratified by sex. Overall, results showed that IL-6 levels increased in response to the stress task (p<.001). In women, increases in IL-6 levels were smaller in those exposed to sexual abuse, relative to those unexposed (geometric mean increases= 1.53 (95% CI: 1.22, 1.90) versus 2.04 (95% CI: 1.70, 2.46), p=0.053), and in those exposed to emotional abuse, relative to those unexposed (geometric mean increases= 1.58 (95% CI: 1.34, 1.87) versus 2.10 (95% CI: 1.77, 2.48), p=.020)), no associations were noted for physical abuse. By contrast in men, although effects were smaller in magnitude compared to women and not statistically significant, individuals exposed to either one of the three abuse subtypes had larger IL-6 responses than those not exposed to child abuse. These results suggest that exposure to child abuse, specifically sexual and emotional abuse, are associated with blunted inflammatory responses to mental stress among women with a recent history of myocardial infarction. These findings add to a growing body of work suggesting that blunted responses to stress may index physiological dysregulation related to chronic stress. They also underscore the importance of examining sex as an effect modifier of relationships between exposure to early life adversity and inflammatory responses to mental stressors in mid-life.

Individual Abstract Number: 1285
Early life adversity as a risk factor for ill health and elevated inflammation: Risk and protective factors
Aoife O'Donovan, PhD, Psychiatry, University of California San Francisco, San Francisco, CA, Joy Lin, MD, Neurology, Stanford University, Palo Alto, CA, David Buergin, BA, Psychology, University of Basel, Basel, Switzerland, Andrea Niles, PhD, Elissa Epel, PhD, Thomas Neylan, MD, Psychiatry, University of California, San Francisco, San Francisco, CA
Background: Early life adversity (ELA) is a risk factor for ill health in adulthood. Identifying mechanisms of ELA-related ill health as well as adulthood risk and protective factors will be critical for developing ameliorative interventions. Chronic inflammation is a mechanism of both mental and physical disease that may be shaped by ELA as well as by later life experiences and behaviors.
Methods: We examined associations of ELA (before age 18) with physical and mental health outcomes and levels of the inflammatory marker high sensitivity C-reactive protein in the population-based Health and Retirement Study (n = 11,198, mean age 69 ± 10). Health outcomes included hypertension, diabetes mellitus, cancer, chronic lung disease, heart conditions, stroke, arthritis, and psychiatric disorders. All models were adjusted for age, gender, race, education, and year of data collection. We also examined the role of potential risk and protective factors, including adulthood trauma exposure and health behaviors as indexed by body mass index (BMI) and self-report of smoking, physical inactivity, and alcohol use.
Results:A total of 3,261 (29%) of individuals had experienced ELA. ELA was associated with higher risk for more physical and mental health problems (p's < .001) and elevated levels of hsCRP (β = 0.03, p = 0.001). Those with ELA were more likely to experience trauma as an adult, smoke, and have higher BMIs (p's ≤ .001). There were no significant differences in hsCRP between those who had versus had not experienced later life adulthood trauma (p = 0.19). Moreover, the association between ELA and hsCRP remained significant when adjusting for smoking and BMI (β = 0.04, p = 0.005).
Conclusion: ELA increases risk for poor mental and physical ill health in late life, which may be accounted for by higher levels of inflammation. Neither adulthood trauma nor health behaviors appeared to account for the higher levels of inflammation observed in those who experienced ELA.

Symposium 1157
Thursday, March 7 from 2:30 to 3:45 pm

Stress and Resilience during the Postpartum Period: Implications for Maternal and Child Health Over the Life Course
Alyssa D. Cheadle, PhD, Psychology, Hope College, Holland, MI, Christine M. Guardino, PhD, Psychology, Dickinson College, Carlisle, PA, Alyssa D. Cheadle, PhD, Psychology, Hope College, Holland, MI, Kharah M. Ross, PhD, Alberta Children's Hospital Research Institute, University of Calgary, Calgary, AB, Canada, Christine M. Guardino, PhD, Psychology, Dickinson College, Carlisle, PA, Julia E. Morgan, MA, Psychiatry, University of California, San Francisco, San Francisco, CA, Molly Fox, PhD, Anthropology, UCLA, Los Angeles, CA
Emerging evidence supports the importance of the period after the birth of a child in influencing subsequent maternal and child health over the life course. Moreover, for women who subsequently have additional children, maternal mental and physical health after the birth of one child may influence outcomes of subsequent pregnancies. The goal of this symposium is to present new research using a life-course perspective and examining the importance of the postpartum period for the health of a family including not only the mother and

child, but also subsequent children. The symposium includes four papers with findings demonstrating that biopsychosocial factors before, during, and after pregnancy have implications for future outcomes including: (1) subsequent maternal biomarkers of health, with implications for a woman's health across the lifespan; (2) birth outcomes in subsequent pregnancies; (3) cognitive and neuroendocrine outcomes in subsequent children.
The first speaker will present data on an important maternal resilience factor, religiousness and spirituality, and inflammation, as indexed by c-reactive protein, from a large, racially diverse sample of women assessed during the year after the birth of a child. New data presented by the second speaker address associations between prenatal and postpartum stress and birth outcomes in a subsequent pregnancy, examining immune cell gene expression as a possible mechanism. The third speaker will describe associations between maternal stress during the postpartum period after the birth of one child and diurnal cortisol patterns in subsequent offspring. Our final speaker will present new work showing that maternal glycemic control, as indexed by HbA1C, during the postpartum period after the birth of a child predicts poorer cognitive flexibility in a subsequent child.
The discussant will summarize the impact of these findings for maternal and child health and discuss an agenda for future research using a life-course approach.

Individual Abstract Number: 1511
Religiousness and Spirituality Predict Lower Inflammation in Women Six Months after the Birth of a Child
Alyssa D. Cheadle, PhD, Psychology, Hope College, Holland, MI, Christine Dunkel Schetter, PhD, Psychology, UCLA, Los Angeles, CA
Background. Religion and spirituality are major forces in the lives of Americans and are especially salient for women and families in the time surrounding the birth of a child. A large and growing body of research indicates that specific aspects of religiousness and spirituality are associated with better physical and mental health. However, the mechanisms of these associations are not well understood, though many have been hypothesized. A few studies link religiousness to inflammation in healthy (non-clinical) samples (Bellinger et al., 2014; Ford, Loucks, & Berkman, 2006; King et al., 2001; Loucks, Berkman, Gruenewald, & Seeman, 2005; Lutgendorf, Russell, Ullrich, Harris, & Wallace, 2004). Inflammation levels during pregnancy and postpartum are important markers and predictors of health for mothers and babies. In this study, we investigated c-reactive protein (CRP) inflammation levels as a potential correlate of religiousness and spirituality in postpartum women.
Methods. Data came from the Community Child Health Network (CCHN) study. In CCHN, mothers were recruited from hospitals at five sites within the United States after the birth of a child and followed for up to 2.5 years. Mothers were interviewed individually in their homes using semi-structured interview protocols at one month (T1), six months (T2), and 12 months post birth (T3). Religiousness and spirituality were assessed at T2 and T3. Blood spots were collected at T2 and T3 and assayed for c-reactive protein (CRP) levels. The total analysis sample was 2,399 mothers. Data were analyzed using structural equation modeling with maximum likelihood estimation.
Results. Religiousness/spirituality as indexed by a latent factor was associated with lower levels of CRP at six months postpartum (β = -0.061, p = 0.015; CFI=0.953). Body mass index was included as a covariate. Spirituality alone did significantly predict lower CRP (β = -0.059, p = 0.020; CFI=0.980) whereas religiousness alone did not (β = -0.046, p = 0.083; CFI=0.970).
Conclusions. Higher religiousness and spirituality together and spirituality alone predicted lower C-reactive protein at six months postpartum. These findings contribute substantially to existing knowledge by demonstrating a link between spirituality and inflammation for the first time in postpartum women for whom inflammation may be especially important and impactful.

Individual Abstract Number: 1193
Preconception and prenatal stressful life events, third trimester inflammatory gene expression, and gestational length
Kharah M. Ross, PhD, Alberta Children's Hospital Research Institute, University of Calgary, Calgary, AB, Canada, Judith E. Carroll, PhD, Psychiatry and Biobehavioral Medicine, Christine Dunkel Schetter, PhD, Psychology, Steve W. Cole, PhD, Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA
Stress exposure predicts adverse pregnancy outcome risk, in part through dysregulated immune activity. Stress during pregnancy is associated with prenatal inflammation, consistent with preterm birth risk. However, research has not tested whether complementary changes are reflected in immune cell gene expression (i.e. upstream regulation of inflammation), or whether stress-associated immune cell gene expression in turn predicts gestational length. We examine associations between: 1. Preconception and prenatal stress exposure and third trimester immune cell gene expression, focusing on stress-associated genes validated in non-pregnant samples (conserved transcriptional response to adversity; CTRA): Pro-inflammatory, antiviral and antibody genes; and 2. Prenatal stress-associated immune cell gene expression and gestational length.
Methods. A sample of 116 low-income, diverse women was drawn from the Community Child Health Network, which followed women over 2-years postpartum. A subgroup became pregnant again over the follow-up, and provided information on stressful life events both preconception and during the third trimester of the second pregnancy. Dried blood spots were collected in the third trimester of that pregnancy, and used for gene expression analysis.
Results. Compared to women with fewer prenatal stressful events, those with more had higher pro-inflammatory gene expression, associated with bioinformatic indications of increased activation of pro-inflammatory transcription factors, NF-kB and AP-1. Preconception stress was not associated with inflammatory gene expression. No stress-related differences emerged for antiviral or antibody genes. When links to gestational length were tested, the *a priori* defined CTRA pro-inflammatory gene set did not emerge as a significant predictor. However, bioinformatically inferred NF-kB activity did predict shorter gestation.
Conclusions. Prenatal stress exposure predicted up-regulated pro-inflammatory gene expression during pregnancy, via inflammatory transcription factors NF-kB and AP-1. Preconception stress exposure did not predict gene expression. In addition, reduced gestational length was related to increased NF-kB prenatally, indicating activation of inflammatory pathways in late pregnancy. These findings highlight an inflammatory pathway linking both maternal stress in pregnancy and shorter gestational length.

Individual Abstract Number: 1536
Diurnal salivary cortisol patterns in preschool-aged children: Associations with maternal pre-pregnancy and prenatal stress
Christine M. Guardino, PhD, Psychology, Dickinson College, Carlisle, PA, Nicole E. Mahrer, PhD, Psychology, University of California Los Angeles, Los Angeles, CA, Elysia P. Davis, PhD, Psychology, University of Denver, Denver, CO, Sharon L. Ramey, PhD, Psychology, Virginia Tech Carilion Research Institute, Roanoke, VA, Madeleine U. Shalowitz, MD, MBA, Pediatrics, NorthShore University HealthSystem, Evanston, IL, Emma K. Adam,

PhD, Human Development and Social Policy, Northwestern University, Evanston, IL, Christine Dunkel Schetter, PhD, Psychology, University of California Los Angeles, Los Angeles, CA
Background: Do a mother's stressful experiences during or even before pregnancy affect stress physiology in offspring? A growing research literature provides evidence that maternal prenatal stress programs stress response systems in children, especially in the hypothalamic-pituitary-adrenal (HPA axis). However, prior studies have not considered the implications of maternal pre-pregnancy stress for offspring physiology.
Purpose: The current study examines diurnal cortisol in preschool-aged children and associations with pre-pregnancy or prenatal stress. We studied multiple potential sources of maternal psychosocial stress (self-reported life events, chronic life stressors, food security, interpersonal violence, racism/discrimination, parenting stress and perceived stress) during the pre-pregnancy and prenatal periods. We predicted that higher pre-pregnancy and prenatal maternal stressors would be associated with flatter diurnal cortisol slopes in their children.
Methods: Participants were predominantly low-income women in Illinois, North Carolina, and Washington, DC. Mothers were recruited after the birth of a child, and studied in their homes during the postpartum period. When mothers became pregnant again, home visits were conducted during and after that pregnancy. Thus, data collected during the postpartum period following the birth of one child served as prospective pre-pregnancy data predicting outcomes for a subsequent child. The present study examines diurnal cortisol production in these (subsequent) children when children are approximately 4 years of age. Saliva samples were collected from children 3 times per day (wake, wake +30, and bedtime) for 3 days.
Results: This presentation will include results of tests of hypotheses for 88 mother-child pairs. Regression models predicting cortisol slopes of children from individual and a composite of the stress measures including covariates will be presented.
Conclusions: This study offers a unique opportunity to examine how multiple indicators of maternal stress before and during pregnancy influences a central marker of stress physiology in low to middle income young children. Findings are relevant to a lifespan approach to maternal-child health that emphasizes the importance of preconception and interpregnancy periods as critical moments to promote optimal individual and family health.

Individual Abstract Number: 1435
Higher Maternal HbA_{1C} after the Birth of One Child Prospectively Predicts Executive Functioning Deficits in Subsequent Offspring
Julia E. Morgan, MA, Psychiatry, University of California, San Francisco, San Francisco, CA, Steve S. Lee, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Christine M. Guardino, PhD, Psychology, Dickinson College, Carlisle, PA, Sharon L. Ramey, PhD, Psychology, Virginia Tech Carilion Research Institute, Roanoke, VA, Madeleine U. Shalowitz, MD, MBA, Pediatrics, NorthShore University HealthSystem, Evanston, IL, Christine Dunkel Schetter, PhD, Psychology, University of California Los Angeles, Los Angeles, CA
Background. Pregestational and gestational maternal diabetes predict cognitive deficits in children, but it is unknown if they uniquely predict child executive functioning (EF). Moreover, it is unclear *when* maternal diabetes is most harmful to offspring neurodevelopment. This study evaluated postpartum maternal glycated hemoglobin (HbA_{1C}) after the birth of one child as a unique predictor of EF in subsequent offspring.
Methods. Participants were 89 children aged 4-6 years (M = 4.67, SD = 0.65; 60.67% female) whose mothers were followed prospectively since the birth of their older siblings as part of the Community Child Health Network, a prospective longitudinal study of maternal health and child development. Maternal HbA_{1C}, a diagnostic indictor of diabetes and reliable marker of glycemic control, was assayed during the postpartum period between the birth of the older sibling and conception of the subsequent child (i.e., interpregnancy period; M months before the date of conception of the subsequent child = 4.82; SD = 4.44, *range* = 0-21.59). Additional biomarkers of maternal metabolic conditions and inflammation, such as C-reactive protein (CRP) and blood pressure, were collected concurrently. Next, mothers who became pregnant again were followed prospectively and prenatal biomarkers were collected during the second and third trimesters. Finally, 89 children from these subsequent pregnancies were followed from birth and assessed for EF (i.e., cognitive flexibility, response inhibition) at ages 4-6 years using the Early Childhood version of the NIH Toolbox Cognition Battery.
Results. Controlling for relevant demographic factors and concurrent maternal CRP and blood pressure, maternal HbA_{1C} from the interpregnancy period inversely predicted cognitive flexibility in the subsequent children at ages 4-6 years (β = -0.24, p = .04). Interpregnancy maternal HbA_{1C} also inversely predicted child cognitive flexibility over and above prenatal HbA_{1C} from the second and third trimesters (β = -0.30, p = .02).
Conclusions. Findings reflect novel, prospective evidence that maternal hyperglycemia uniquely predicts the development of cognitive flexibility deficits in children, and that this association is specific to pregestational hyperglycemia. Findings also highlight the relevance of maternal physical health after the birth of one child to subsequent pregnancy outcomes.

Symposium 1182
Saturday, March 9 from 12:15 to 1:30 pm

A Mechanism-Focused Approach to Behavioral Intervention Research: Promoting Health by Engaging Key Underlying Processes
Lisbeth Nielsen, PhD, Individual Behavioral Processes Branch, National Institute on Aging, Bethesda, MD, Paige Green, PhD, Basic Biobehavioral and Psychological Sciences Branch in the Behavioral Research Program, National Cancer Institute , Bethesda, MD, Jennifer A. Sumner, PhD, Center for Behavioral Cardiovascular Health, Department of Medicine, Columbia University Medical Center, New York, NY, Talea Cornelius, PhD, Center for Behavioral Cardiovascular Health, Department of Medicine, Columbia University Medical Center, New York, NY, Emily K. Lindsay, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Eric Loucks, PhD, Epidemiology, Brown University School of Public Health, Providence, RI
Unhealthy behaviors—including smoking, overeating, medication nonadherence, and physical inactivity—account for over 40 percent of preventable, premature deaths in the US. For years, researchers, clinicians, and policy makers have sought to improve health outcomes by promoting behavior change, but it has proved challenging. In fact, *few interventions currently exist that produce reliable, long-lasting behavior change for large numbers of people*. Furthermore, even when an intervention brings about behavior change, we rarely know *why* or *how* the intervention was successful. Recently, behavioral scientists have been coalescing around promising approaches to advancing a more unified, mechanism-focused behavior change science that can accelerate progress in addressing this public health challenge.
This symposium will feature presentations from four scientists taking novel approaches to bringing about sustainable behavior change, with a focus on identifying and engaging key
underlying mechanisms. First, there will be an introduction to

the NIH Science of Behavior Change (SOBC) mechanism-focused approach to behavior change science, with an emphasis on the SOBC method and resources that are available to the scientific community. Next, three researchers both within and outside of the SOBC Research Network will provide examples of approaches to changing behavior by engaging psychological mechanisms such as self-regulation and interpersonal processes through mindfulness training and a couples-based approach to weight loss. These mechanisms are targeted as a means to promote changes in health behavior outcomes including behavioral determinants of hypertension and weight loss. The symposium will end with a panel discussion led by two NIH representatives involved in SOBC in which presenters will discuss future directions, highlight synergies between their work, and take questions from the audience.

Individual Abstract Number: 1379

The NIH Science of Behavior Change Mechanism-Focused Approach to Behavior Change Research

Jennifer A. Sumner, PhD, Jeffrey L. Birk, PhD, Talea Cornelius, PhD, Lilly Derby, BS, Donald Edmondson, PhD, Karina W. Davidson, PhD, Center for Behavioral Cardiovascular Health, Department of Medicine, Columbia University Medical Center, New York, NY

Behaviors are some of the most important factors for whether individuals live long, healthy lives. However, it is difficult for individuals to initiate and maintain healthy behavior changes over time. Supported by the National Institutes of Health (NIH) Common Fund, the Science of Behavior Change (SOBC) program seeks to make behavior change research more impactful, targeted, and systematic by promoting a common, mechanism-focused, experimental medicine approach. In these efforts, SOBC is opening up the "black box" of behavior change and shedding light on how behavior change works. To identify key mechanisms of behavior change, SOBC's experimental medicine approach involves 1) identifying a hypothesized mechanism of behavior change, 2) measuring the mechanism in reliable and valid ways, 3) manipulating that mechanism experimentally, and then 4) determining whether engaging the mechanism results in behavior change. SOBC has advancing research measurement at its core, and the program is developing resources for the global scientific community to use to improve measurement of key mechanisms that are relevant to behavior change and health, including stress, self-regulation, and interpersonal and social processes. Furthermore, revealing how and why people make and sustain healthy behaviors will be used to inform the development of more efficient and effective behavioral interventions.

This presentation will illustrate the SOBC experimental medicine approach to behavior change research and introduce attendees to the SOBC Measures Repository, a free, online resource of behavioral sciences measures that have been validated (or are undergoing documented validation testing) with the SOBC method. The SOBC Measures Repository offers researchers a way to advance, and engage with, behavior science research tools that have been tested using the SOBC experimental medicine approach. An essential and unique feature of the repository is the documentation of a measure's status through the steps of the SOBC method. Attendees will learn about these SOBC resources and how they can incorporate them into their work.

Individual Abstract Number: 1382

Increasing Autonomy Support to Promote Weight Loss in Couples

Talea Cornelius, PhD, Center for Behavioral Cardiovascular Health, Department of Medicine, Columbia University Medical Center, New York, NY, Katelyn Gettens, MA, Psychological Sciences, University of Connecticut, Storrs, CT, Theodore Powers, PhD, Psychology, University of Massachusetts Dartmouth, Dartmouth, MA, Amy A. Gorin, PhD, Psychological Sciences, University of Connecticut, Storrs, CT

Background. Social support from a romantic partner is associated with weight-loss (WL) success. Yet, not all support is created equal. In particular, consistent with Self-Determination Theory (SDT), autonomy support (AS) tends to be associated with greater WL, whereas more directive forms of support can be ineffective or harmful. The present work followed the steps of the Science of Behavior Change experimental medicine approach using a couples-based intervention to (1) increase AS for WL and (2) observe whether an increase in AS was associated with greater WL 6- and 12-months later.

Method. Couples (N = 64) were recruited via local advertising (both members had to have a body mass index between 25-45 kg/m^2) and attended an orientation session where they provided written informed consent, and were randomized either to 6 months of standard behavioral WL treatment (BWL) or to 6 months of standard treatment supplemented by training designed to increase AS (SDT-WL). Standard treatment consisted of weekly group sessions and information about diet and physical activity. AS training included perspective taking, minimizing control, non-critical language, supporting change, and empathic responding. Couples completed assessments of AS and were weighed at baseline, 3, 6, and 12 months.

Results. Participants were a mean of 53.45 years old (SD = 10.04), majority heterosexual, (96.9%), and majority white (92.2%). Change in AS did not differ across condition at 3, 6, or 12 months, p = .31. However, post-hoc moderation analysis suggested that this may be contingent upon baseline levels of AS, p = .017. When baseline AS was low (-1SD), SDT-WL couples (v. BWL couples) experienced a larger increase in AS from baseline to 12 months, B = 0.31, p = .015. Higher baseline AS predicted greater 6-month percent WL, B = -2.31, p = .004, as did increases in AS from baseline to 3 months, B = -2.12, p = .020. This pattern replicated at 12 months. Baseline AS, B = -3.84, p < .001, and increase in AS from baseline to 6 months, B = -3.60, p < .001, also predicted greater 12-month percent WL.

Conclusion. AS is a potential mechanism of behavior change that could be targeted to promote WL in couples. Indeed, increases in AS reliably predict WL success. Although SDT-WL did not lead to significant increases in AS, this could be due to high levels of AS at baseline.

Individual Abstract Number: 1380

Mindfulness training engages interpersonal processes: A randomized controlled trial

Emily K. Lindsay, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Shinzen Young, PhD, Psychiatry, University of Vermont, Burlington, VT, Kirk W. Brown, PhD, Psychology, Virginia Commonwealth University, Richmond, VA, Joshua M. Smyth, PhD, Biobehavioral Health, Penn State University, University Park, PA, J. David Creswell, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA

Background: Loneliness and social isolation are among the most robust known risk factors for poor health and accelerated mortality. Improvements in these interpersonal processes may be a key mechanism of behavioral interventions that promote health behaviors and influence health and mortality over time. Mindfulness interventions in particular have shown promise for engaging these interpersonal mechanisms, but the active ingredients of mindfulness interventions that drive these improvements are unclear. Developing mindfulness-specific skills, namely *monitoring* present-moment

experiences with an orientation of *acceptance*, may change the way people perceive and relate toward others. We predicted that acceptance skills are critical for reducing loneliness and increasing social contact, and tested whether removing acceptance training from a mindfulness intervention would eliminate these social benefits.
Methods: In this randomized controlled dismantling trial, 153 adults were randomly assigned to a 14-lesson smartphone-based intervention: (a) training in both monitoring and acceptance (Monitor+Accept), (b) training in monitoring only (Monitor Only), or (c) active control training. For three days before and after the interventions, ambulatory assessments were used to measure loneliness and social contact in daily life.
Results: As predicted, Monitor+Accept training significantly reduced daily life loneliness by 22% (d=.44, p=.0001) and increased social contact by two more interactions each day (d=.47, p=.001) and one more person each day (d=.39, p=.004) compared to both Monitor Only and control.
Conclusions: Following the Science of Behavior Change experimental medicine framework, we *identified* loneliness and social isolation as mechanisms that might influence health behaviors, *measured* loneliness and social contact in daily life, and *influenced*these interpersonal processes through mindfulness intervention. Further work is needed to test whether these changes in loneliness and social contact promote health behavior change over time. Importantly, acceptance training is a critical component of mindfulness interventions that engages these social mechanisms. Overall, experiential acceptance is a novel behavioral therapeutic target for improving social relationship processes that may in turn improve health behaviors.

Individual Abstract Number: 1381
Mindfulness-Based Blood Pressure Reduction: Stage 1 Single-Arm Clinical Trial
Eric Loucks, PhD, Epidemiology, Brown University School of Public Health, Providence, RI, William Nardi, BSc, Behavioral and Social Sciences, Brown, Providence, RI, Ian Kronish, MD, Medicine, Columbia University, New York, NY, David Vago, PhD, Pschiatry and Behavioral Sciences, Vanderbilt University, Nashville, TN
BACKGROUND AND OBJECTIVES: Impacts of mindfulness-based interventions on blood pressure remain equivocal, possibly because interventions are not customized to engage with determinants of hypertension. Primary objectives were to create a customized Mindfulness-Based Blood Pressure Reduction (MB-BP) intervention, and evaluate acceptability, feasibility, and effects on hypothesized proximal self-regulation mechanisms.
METHODS: This was a Stage 1 single arm trial with one-year follow-up. Focus groups and in-depth interviews were performed to evaluate acceptability and feasibility. Self-regulation and health behavior outcomes were assessed using validated questionnaires or objective behavioral assessments. The MB-BP curriculum was adapted from Mindfulness-Based Stress Reduction to direct participants' mindfulness skills towards modifiable determinants of blood pressure.
RESULTS: Acceptability and feasibility findings showed that of 53 eligible participants, 48 enrolled (91%). Of these, 43 (90%) attended at least 7 of the 10 MB-BP classes; 43 were followed to one year (90%). Focus groups (n=19) and semi-structured interviews (n=7) showed all participants viewed the delivery modality favorably, however logistic considerations concerning program access were barriers. Participants identified several intervention attributes as positive, including (1) intervention's experiential, didactic approach to mindfulness and hypertension education; (2) course length and number of contact hours. *A priori* selected primary self-regulation outcomes showed improvements at one-year follow-up *vs*. baseline, including attention control (Sustained Attention to Response Task correct no-go score, p<0.001), emotion regulation (Difficulties in Emotion Regulation Score, p=0.02), and self-awareness (Multidimensional Assessment of Interoceptive Awareness, p<0.001). Several determinants of hypertension were improved in participants not adhering to American Heart Association guidelines at baseline, including physical activity (p=0.02), Dietary Approaches to Stop Hypertension-consistent diet (p<0.001), and alcohol consumption (p<0.001).
CONCLUSION: Findings suggest that MB-BP may engage with self-regulation and behavioral determinants of hypertension. Threats to causal inference remain with the study being single-arm. A Stage 2a randomized controlled trial is underway to address limitations.

Symposium 1186
Thursday, March 7 from 11:00 am to 12:00 pm

Identifying intervention targets to simultaneously reduce posttraumatic stress disorder and secondary cardiovascular disease risk: The REACH studies
Donald Edmondson, PhD, MPH, Medicine, Columbia University Medical Center, New York, NY, Bernard P. Chang, MD, PhD, Emergency Medicine, Columbia University Medical Center, New York, NY, Jeffrey L. Birk, PhD, Medicine, Columbia University Medical Center, New York, NY, Laura Meli, MS, Clinical Psychology, Columbia University, Teachers College, New York, NY, Ian Kronish, MD, MPH, Medicine, Columbia University Medical Center, New York, NY
This symposium will present data from the largest study to date of posttraumatic stress (PTS) reactions to cardiovascular disease (CVD) events and their association with risk for recurrent CVD events. The REactions to Acute Care and Hospitalizations (REACH) studies began enrolling acute coronary syndrome (ACS) patients in 2013, and the founding study completed enrollment (n=1,744) in 2018. Presenters will include early career and senior psychologists and physicians, who will present findings on (1) the influence of interoceptive biases on trajectories of PTSD symptoms over 1 year in confirmed ACS patients and those who rule out, (2) evidence that interventions to reduce interoceptive bias and fear of recurrence may offset PTSD risk, (3) the momentary influence of interoceptive bias on autonomic dysregulation (i.e., from 2 weeks of ambulatory ECG, physical activity, and EMA assessment of cardiac threat perceptions), and (4) the relationship between perceived threat and patient treatment preferences during evaluation following acute stroke.

Individual Abstract Number: 1641
The Association of Threat Perception and Patient Treatment Preferences in Acute Stroke
Bernard P. Chang, MD, PhD, Emergency Medicine, Donald Edmondson, PhD, MPH, Jeffery L. Birk, PhD, Medicine, Columbia University Medical Center, New York, NY, Laura Meli, MS, Clinical Psychology, Columbia University, Teachers College, New York, NY, Jennifer A. Sumner, PhD, Lilly Derby, BS, Talea Cornelius, PhD, MSW, Ian Kronish, MD, MPH, Medicine, Columbia University Medical Center, New York, NY

Introduction: Understanding patient preferences may help guide decision making around discharge timing after TIA or minor stroke (TIAMS) and may lead to treatment algorithms with higher patient satisfaction and adherence. Psychological stress, particularly a sense of helplessness and vulnerability (defined as "threat perception") may be associated with adverse psychological outcomes following TIAMS, including the development of post-traumatic stress. We hypothesized that TIAMS patients with higher threat perception would be more likely to prefer inpatient care over early emergency department (ED) discharge.
Methods: We analyzed ED patients in a large urban academic medical center with suspected TIAMS (defined as National Institutes of Health Stroke Scale (NIHSS) score of ≤5). Patients reported discharge preferences and completed a validated 7 item self-report scale of threat perception (e.g. "I am worried I am going to die. I feel helpless").
Results: 302 suspected TIAMS patients were evaluated (mean age: 63.7±15.1, 52% female, 24.8% Black, 48% Hispanic, median NIHSS= 2). 217 patients (70.7%) preferred hospital admission compared to ED discharge. In unadjusted analysis, those who preferred admission had similar ED threat scores compared to those who preferred early discharge (8.1 ±5.2 vs 7.2±4.8; p=0.24). In the adjusted model, threat perceptions remained unassociated with discharge preference, however, women and Hispanics were more likely to prefer inpatient admission (Table)
Conclusion: Overall, TIAMS patients preferred inpatient admission over early discharge. Discharge preference was not associated with higher threat perception. Further research examining potential drivers of patient preferences may inform patient discussions and optimize patient satisfaction with rapid outpatient TIAMS care.

Individual Abstract Number: 1688
An Examination of Diurnal Heart Rate and Cardiac-Related Intrusive Thoughts in Acute Coronary Syndrome Patients with and without Posttraumatic Stress Symptoms
Jeffrey L. Birk, PhD, Jennifer A. Sumner, PhD, Ari Shechter, PhD, Talea Cornelius, PhD, Medicine, Columbia University Medical Center, New York, NY, Joseph E. Schwartz, PhD, Applied Behavioral Medicine Research Institute, Stony Brook University, New York, NY, Donald Edmondson, PhD, MPH, Medicine, Columbia University Medical Center, New York, NY
Background. Acute coronary syndrome (ACS) can lead to posttraumatic stress symptoms (PSS) that increase the risk of recurrent cardiovascular events. Physiological hyperarousal, as reflected by increased heart rate (HR), is a component of PSS that poses a serious health risk, especially if evident during nighttime hours. Research is needed to test whether ACS patients with v. without PSS show higher HR. Heart-related intrusive thoughts may occur for patients with PSS. Research should test whether this re-experiencing symptom is related to HR in patients' daily lives.
Method. Participants were ACS patients (unstable angina or non ST-elevated myocardial infarction) enrolled 1 month after hospital discharge with (n = 24) or without (n = 55) PSS symptoms. Heart rate was assessed continuously for up to 2 weeks via a wearable chest patch (ZioPatch, iRhythm Technologies, Inc, San Francisco, CA). Wrist actigraphy worn 24 hours/day and self-reported intrusive thoughts were measured via ActiWatch Spectrum Pro (Philips Respironics, Murrysville, PA). Participants were asked 5 times a day between 10 am and 8 pm to report the occurrence and severity of intrusive thoughts with two items: (1) "In the past 2 hours, did any distressing intrusive images or thoughts about your heart problem come to mind?" (1 *yes*; 0 *no*); (2) "How distressing were the thoughts or images you experienced?" (scale: 0 to 6). Group differences in 24-hour HR patterns were tested using multilevel modeling, accounting for demographic characteristics and random effects (person, day, and sinusoidal curve).
Results. Diurnal HR patterns differed for patients with v. without PSS, $p < .05$, as characterized by less nighttime dipping and a 50% smaller peak-trough amplitude (see Figure). PSS were positively correlated with the proportional occurrence (r = .33, p = .004) and severity (r = .30, p = .009) of intrusive thoughts. However, neither the occurrence nor severity of intrusive thoughts was associated with concurrent 2-hour mean HR, and this association was not moderated by PSS group, ps > .05.
Conclusion. Elevated ACS-related PSS symptoms at 1 month post-discharge were associated with disrupted 24-hour diurnal pattern of HR as well as more frequent and severe intrusive cardiac-related thoughts. Future research should further investigate whether and for whom ACS-related intrusive thoughts and HR are associated.

Individual Abstract Number: 1696
Trajectories of Posttraumatic Stress Symptoms in Patients with Confirmed and Rule-Out Acute Coronary Syndrome
Laura Meli, MS, Clinical Psychology, Columbia University, Teachers College, New York, NY, Jeffrey L. Birk, PhD, Donald Edmondson, PhD, MPH, Medicine, Columbia University Medical Center, New York, NY, George A. Bonanno, PhD, Clinical Psychology, Columbia University, Teachers College, New York, NY
Background. Acute coronary syndrome (ACS) is a life-threatening, potentially traumatic event (PTE) associated with elevated risk for posttraumatic stress disorder (PTSD). ACS-induced PTSD has been connected to cardiac event recurrence and mortality. However, little is known about variations in psychological stress response after ACS. Our study estimated longitudinal trajectories of posttraumatic stress symptoms (PTSS) after emergency department (ED) evaluation for suspected ACS.
Method. 1000 adults enrolled in an observational cohort study of patients presenting to the ED with suspected ACS were approached in the ED where they reported on demographics and ED threat perceptions. Upon transfer to an inpatient bed, measures of cardiac-related PTSS were completed. After discharge, medical information and discharge diagnosis was extracted from medical records. At 1-, 6-, and 12-months, participants reported on cardiac-related PTSS. We performed Latent Growth Mixture Modeling (LGMM) to identify PTSS trajectories over a one-year period. The effect of demographic, medical, and psychosocial covariates on trajectory class was examined using one-way ANOVA and Chi-Square analyses. The effect of discharge diagnosis was examined using Chi-Square and a known-class analysis.
Results. PTSS trajectories were identified in an unconditional model. Significant covariates, including gender and ED and cardiac threat perceptions, were entered as predictors of class membership in a conditional model. Three trajectories demonstrated strongest model fit: *Resilient* (81.75%), *Chronic-Worsening* (13.69%), and *Acute-Recovering* (4.56%). The *Chronic-Worsening* and *Acute-Recovering* classes reported higher ED (b = 0.13, SE = 0.03, p < .001; b = 0.29, SE = 0.06, p < .001) and cardiac threat perceptions (b = 0.24, SE = 0.04, p < .001; b = 0.35, SE = 0.08, p < .001) than the *Resilient* class. The *Acute-Recovering* class reported significantly higher ED threat perceptions (b = 0.15, SE = 0.06, p = .008) than the *Chronic-Worsening* class. Discharge diagnosis did not vary significantly across trajectories ($\chi^2(2) = 2.93$, p = .231).
Conclusion. ED treatment for suspected ACS events is a PTE resulting in heterogenous patterns of PTSS. Our findings suggest that ED experiences that are perceived as more threatening may be associated with higher PTSS and worse clinical course, regardless of diagnosis.

Symposium 1212
Friday, March 8 from 1:30 to 2:45 pm

Beyond panic: An update on the prognosis, risk factors and treatment of patients with non-cardiac chest pain.

Guillaume Foldes-Busque, PsyD, PhD, Psychology, Universite Laval, Quebec, QC, Canada, Marie-Andrée Tremblay, B.A., Psychology, Universite Laval, Quebec, QC, Canada, Stéphanie Hamel, B.A., Psychology, Universite Laval, Quebec, QC, Canada, Joanne Castonguay, B.A., Psychology, Universite Laval, Quebec, QC, Canada

Non-cardiac chest pain (NCCP) can be defined as chest pain without a clear and sufficient medical explanation. Up to 33% of the general population will experience non-cardiac chest pain at some point in their life. The high prevalence of NCCP, combined with the frequent and resource-intensive medical investigations associated with this condition, result in societal costs that exceed those of angina and myocardial infarction combined. While generally medically benign, NCCP tends to recur over time and is associated with significant impairment in daily functioning and high levels of psychological distress.

NCCP has received significant attention from researchers since the 1980s, most notably following the observation of a high prevalence of panic disorder and panic attacks (14%-43%) in this population. Further studies have investigated the prognosis of NCCP and aimed at identifying the implicated psychosocial risk factors. This knowledge has led to the development of psychological interventions for patients with NCCP which generally yield moderate results. Even with this progress, knowledge on all aspects of NCCP, from its evolution to its treatment, remains limited.

This symposium will present novel findings that aim to bridge several knowledge gaps on NCCP. The first speaker will present results from a large prospective cohort study of emergency department patients with NCCP to address the knowledge gaps on its prognosis. The second speaker will describe how patients with NCCP can be classified in clinically relevant subgroups according to psychological variables and how these subgroups differ in terms of prognosis. The third study will further explore the mechanisms linking pathological anxiety and the burden of NCCP with the aim of providing insight on how to improve interventions aimed at patients with this comorbidity. The last presentation reports the results from the preliminary investigation of a novel intervention for patients with recurrent NCCP without comorbid psychiatric disorders.

Overall, this symposium present findings that will further our understanding of NCCP and provide data to guide clinical practice.

Individual Abstract Number: 1213

Prognosis of non-cardiac chest pain in the 12 months following a consultation in an emergency department.

Guillaume Foldes-Busque, PsyD, PhD, Psychology, Universite Laval, Quebec, QC, Canada, Stephane Turcotte, MSc, Research Centre, CISSS de Chaudière-Appalaches, Levis, QC, Canada, Clermont Dionne, PhD, Rehabilitation, Richard Fleet, MD, PhD, Patrick Archambault, MD, Family and emergency medicine, Isabelle Denis, PsyD, PhD, Psychology, Universite Laval, Quebec, QC, Canada

Background: Despite a generally favorable medical prognosis, between 45 and 80% of patients with non-cardiac chest pain (NCCP) still experience chest pain episodes up to 10 years after the initial medical consultation. The proportion of patients for which NCCP is a source of functional impairment is estimated at 17 to 63% of patients over the same time period. In light of the limited overlap between recurrence rates of NCCP recurrence and its impact in patients' lives as well as the significant variability in rates across studies, further prospective, longitudinal studies are needed to clarify the prognosis of NCCP.

Objective: To prospectively describe the course of NCCP and its resulting impairments in the 12 months following an emergency department consultation.

Method: A total of 791 (M = 54, SD = 15.2; 50.7% female) consecutive emergency department patients with NCCP were followed over a 12-month period. Patients completed a phone interview to assess NCCP frequency, intensity and associated impairments in social, family, work and physical functioning at baseline and at 6- and 12-month follow-ups.

Results: At baseline, 41.4% of patients experienced NCCP episodes at least monthly, while 30.6% and 24.6% respectively did so at the 6-month and 12-month follow-ups. Overall, 47.0% of patients still experienced NCCP at some frequency one year after the emergency department consultation. Significant NCCP-related impairment in daily functioning was reported by 42.0% of patients at baseline. Over the course of the study, 15.3% of the sample either remained impaired by their NCCP or developed NCCP-related impairment. The majority of patients (75.8%) stayed or became impairment-free at 12 months. For 8.8% of patients, the evolution of NCCP-related impairment was unstable.

Conclusions: While the current results show rates of NCCP-related impairment and recurrence that are lower than previously estimated, they highlight that this condition has significant and long-lasting consequences for a sizable proportion of patients.

Individual Abstract Number: 1314

Psychological profiles of patients with non-cardiac chest pain: a 1-year follow-up study

Marie-Andrée Tremblay, B.A., Psychology, Universite Laval, Quebec, QC, Canada, Isabelle Denis, Ph.D., Psychology, Université Laval, Québec, QC, Canada, Stéphane Turcotte, M.Sc., Research Center, Centre intégré de santé et de services sociaux de Chaudière-Appalaches, Québec, QC, Canada, Richard Fleet, MD, Ph.D., Patrick Archambault, MD, Family and Emergency Medicine, Clermont Dionne, Ph.D., Rehabilitation, Guillaume Foldes-Busque, Ph.D., Psychology, Universite Laval, Québec, QC, Canada

Background: Over the past decades, several psychological variables have been associated with the development, maintenance and exacerbation of non-cardiac chest pain (NCCP). Among them, panic disorder (PD) has been consistently associated with poor outcomes in patients with NCCP. However, other forms of pathological anxiety, such as heart-focused anxiety (HFA), have been found to contribute to increased psychological distress, functional impairment and healthcare utilization in these patients. Identifying how psychosocial constructs cluster together and influence prognosis in patients with NCCP is an essential step to improve our understanding of this problem and improve clinical care.

Objectives: To identify the psychological profiles of patients with NCCP and to prospectively assess the differential course of NCCP-related impairment and quality of life associated with these profiles.

Method: Patients who consulted in two emergency departments with NCCP completed a phone interview and questionnaires assessing the presence of anxiety disorders (AD), HFA and other relevant psychosocial variables, NCCP-related impairment and quality of life. Follow-up phone interviews and questionnaires were administered 6 and 12 months later.

Results: Among the 706 participants (M = 55.2, SD = 15.1; 52.7% females), a multiple correspondence analysis identified 3 mutually exclusive groups: the AD group, the elevated HFA group and the low HFA group. There was a significant difference between groups on the level of NCCP-related impairment (AD group > elevated HFA group > low HFA group, $p<0.01$). A significant time x group interaction was found on both quality of life measures ($p<0.01$). At baseline,

physical quality of life (PQOL) (AD/elevated HFA group > low HFA group, p<0.01) and mental quality of life (MQOL) (AD group > elevated HFA group > low HFA group, p<0.01) differed between groups. The AD group did not significantly improve over time on PQOL (p=0.22) but did so on MQOL (p<0.01), although both scores remained lower than that of the other groups. The elevated HFA group improved on both scales over time (p<0.01) while the low HFA group remained stable (p>0.05).
Conclusion: Patients with NCCP can be classified in clinically relevant subgroups based on the presence of AD and the level of HFA. This data could guide the development of interventions targeting their specific needs.

Individual Abstract Number: 1352
Explaining non-cardiac chest pain related impairment in patients with comorbid anxiety disorder
Stéphanie Hamel, B.A., Isabelle Denis, Psy.D., Ph.D., Psychology, Universite Laval, Quebec, QC, Canada, Stéphane Turcotte, M.Sc., Research Centre, CISSS de Chaudière-Appalaches, Lévis, QC, Canada, Richard Fleet, M.D., Ph.D., Patrick Archambault, M.D., Family and Emergency medicine, Clermont Dionne, Ph.D., Rehabilitation, Guillaume Foldes-Busque, Psy.D., Ph.D., Psychology, Universite Laval, Quebec, QC, Canada
Background. One of the main factors associated with a negative prognosis of non-cardiac chest pain (NCCP) is the presence of panic disorder (PD) or generalized anxiety disorder (GAD). A closer look at the theoretical models of NCCP, PD and GAD indicates that their association may be explained by mutual maintenance and aggravating factors such as anxiety sensitivity (AS), heart-focused anxiety (HFA) and alexithymia. This study aims to assess how these factors interact to explain clinically significant NCCP related impairment in patients with comorbid PD or GAD as presented in our explanatory model (see Figure 1).
Objectives. (1) Assess the course of clinically significant NCCP related impairment in patients presenting comorbid PD or GAD six months following the consultation at the emergency department and (2) empirically test the explanatory model of NCCP related impairment in these patients.
Methods. This prospective cohort study includes 124 emergency department patients with NCCP and PD or GAD. NCCP related impairment was assessed at baseline and six-month follow-up with a structured phone interview while PD and GAD were assessed with the *Anxiety Disorders Schedule for DSM-IV* at baseline. Self-reported questionnaires were used to assess anxiety severity, AS, HFA and alexithymia at baseline.
Results. The sample included 65 women (52.4%) with a mean age of 53.6 years (SD = 15.3). At baseline, 58.5% (n = 72) of patients reported clinically significant NCCP related impairment and 34.7% (n = 43) did so at six-month follow-up. Patients with PD, with or without comorbid GAD, were more likely to report persistent clinically significant NCCP related impairment than those with GAD alone (p = 0.04). A positive causal effect was found between anxiety severity, AS, HFA and NCCP related impairment (p< 0.05). HFA was the only factor directly associated with NCCP related impairment at six-month follow-up. The effect of anxiety severity on HFA was fully mediated by AS which in turn was only associated with NCCP related impairment through its association with HFA.
Conclusions. HFA is central in the relationship between PD/GAD and clinically significant NCCP related impairment. Interventions that specifically target HFA would be a promising strategy to promote remission of NCCP following treatment of PD or GAD in patients with both conditions.

Individual Abstract Number: 1316
Feasibility and impact of a brief cognitive-behavioral intervention in conjunction with an aerobic exercise program for managing non-cardiac chest pain: A pilot study.
Joanne Castonguay, B.A., Psychology, Universite Laval, Quebec, QC, Canada, Paul Poirier, M.D., Ph.D., FRCPC, FCCS, FACC, FAHA, Research Centre, Quebec Heart and Lung Institute, Quebec, QC, Canada, François Grondin, M.D., Cardiology, Centre intégré de santé et de services sociaux Chaudière-Appalaches, Quebec, QC, Canada, Jean Doré, M.D., Kinesiology, Isabelle Denis, Psy. D., Ph.D., Guillaume Foldes-Busque, Psy. D., Ph.D., Psychology, Universite Laval, Quebec, QC, Canada
Backround: Cognitive-behavioral therapy (CBT) has shown significant but limited effectiveness in reducing the burden of non-cardiac chest pain (NCCP). Recent studies have shown that aerobic exercise (AE) can improve quality of life and reduce pain intensity in patients with different chronic pain conditions. Furthermore, AE also have a positive effect on factors, such as fear of bodily symptoms and general anxiety, that are associated with the recurrence and severity of NCCP. Combining CBT and AE could result in significant improvement in NCCP symptoms and the associated morbidity.
Objectives: To evaluate the impact of a brief CBT intervention in conjunction with a 10-week AE program on the frequency and intensity of NCCP and on the participants' quality of life. A second objective is to assess the impact of this intervention on anxiety as well as fear of and vigilance to physical sensations.
Method: This study involved 22 patients with recurrent NCCP who were recruited following a treadmill exercise stress test in two Cardiology Departments. Patients were randomized to one of the intervention condition (3 session CBT + 10 weeks AE program) or control condition (treatment as usual) after they underwent an interview and a battery of self-report questionnaires. These measure were readministered following the intervention and 3 months later.
Results: The sample consisted of 9 women and 13 men with a mean age of 57 years. The treatment group (n=12) experienced significantly greater reduction in pain catastrophization than the control group (n=10) at post treatment and 3-month follow-up (p = 0.048). The participants of both conditions reported significant reduction in the intensity of NCCP and in the intensity of fear of physical sensations (p < 0.05). Both groups also reported improved quality of life (p = 0.011). These gains could be explained by the marked increase in exercise in both groups: at 3-month follow-up, the number of minutes of weekly exercise increased significantly in the control (mean of 164.02 minutes ± 81.34) and the treatment group (M = 164.23 minutes, SD = 85.43).
Conclusion: Promoting regular exercise on a regular basis may be a promising option in the treatment of NCCP. Adding CBT to AE seems to make it possible to specifically target pain catastrophizing.

Symposium 1241
Thursday, March 7 from 2:30 to 3:45 pm

Psychosocial Resources and Risk for Cardiovascular Disease: Findings from Across the Life Course
Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Kristen Nishimi, MPH, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA, Jennifer Boylan, PhD, Health and Behavioral Sciences, University of Colorado Denver, Denver, CO, Tara Gruenewald, PhD, Psychology, Chapman University, Orange, CA
Cardiovascular disease (CVD) is the leading cause of death worldwide. Recent evidence suggests that older adults with high

levels of psychosocial resources—including positive thoughts and feelings such as optimism—have reduced risk of incident CVD. However, less research has investigated whether psychosocial resources are associated with cardiovascular risk factors or when the protective effects of psychosocial resources may begin. This symposium brings together research from across the life course to investigate how psychosocial resources may protect cardiovascular-related functioning. Numerous psychosocial resources will be considered including optimism, purpose in life, psychological resilience, conscientiousness, and supportive social relationships. Across studies, psychosocial resources are evaluated not only by self-report, but also via novel methods. Moreover, a variety of outcomes relevant for CVD will be discussed. The first speaker will present findings suggesting that 11-year-old British children with high levels of optimism and supportive social relationships may have healthier weight status 30 years later. The second speaker will present findings exploring whether lower versus higher psychological resilience to childhood adversity is related to dysregulated salivary cortisol levels in young adults. The third speaker will present findings from a cohort of more than 100,000 U.S. Army active duty soldiers in which more optimistic soldiers had a reduced risk of developing hypertension across an average of 3.5 years. The fourth speaker will present findings that examine whether purpose in life, conscientiousness, and optimism buffer the effects of childhood socioeconomic disadvantage on inflammation levels in Whites and Blacks during midlife. Finally, an expert on the role of psychosocial resources in health and aging will integrate findings and offer suggestions for future research. Taken together, this symposium explores whether psychosocial resources can protect against cardiovascular risk using empirical evidence from unique cohorts at different points in the lifespan. Such work not only contributes to a deeper understanding of the psychosocial resources that may promote cardiovascular functioning across the life course, but may also have implications for the implementation of prevention and intervention strategies to reduce risk of CVD.

Individual Abstract Number: 1315

Psychosocial Resources in Childhood and Weight Status Thirty Years Later

Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Wendy Berry Mendes, PhD, 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

Background: The prevalence of obesity continues to increase worldwide. Although researchers have identified factors in childhood that confer risk for adult obesity, less work has evaluated protective factors in childhood that increase the likelihood of having healthy weight status in adulthood. We hypothesized that children with higher versus lower levels of psychosocial resources would have healthier weight status in midlife.

Methods: Data were from the 1958 National Child Development Study, an ongoing birth cohort. At age 11 participants wrote an essay about their imagined life at age 25. Four trained coders rated the essays for the presence of positivity, optimism, purpose in life, and supportive social relationships. For every essay, ratings for each resource were first averaged across coders and then summed to create total psychosocial resources (higher scores indicated more resources). Weight status at age 45 was clinically assessed via waist to hip ratio (WHR). Intraclass coefficients (ICCs; two-way random effects with absolute agreement) were calculated to assess interrater agreement. Linear regression analyses evaluated associations between psychosocial resources and WHR in 404 participants with legible essays and biomedical data. Models were first unadjusted and then statistically controlled for sex, child social class, and child cognitive ability.

Results: ICCs indicated good interrater agreement (≥0.75), but purpose in life ratings were lower (0.65). In unadjusted models, higher total psychosocial resources were significantly associated with smaller WHR (p<.0001; r=-0.22). The association was attenuated after adjusting for gender (p<.10) and was not significant when also adjusting for social class and cognitive ability. The pattern was similar when considering resources individually. Positivity, optimism, and social relationships were each associated with smaller WHR in unadjusted models (r=-0.12 to -0.26), but associations were attenuated with further adjustment. Purpose in life was not related to WHR.

Conclusions: This study is one of the first of its kind to predict adult weight status from childhood psychosocial resources across more than 30 years. Findings were based on a novel method of assessing psychosocial resources and indicate that protective factors in childhood may put individuals on a trajectory towards achieving healthy weight status.

Individual Abstract Number: 1476

Association Between Psychological Resilience Following Childhood and Adolescent Adversity and Diurnal Salivary Cortisol in Young Adulthood

Kristen Nishimi, MPH, Social and Behavioral Sciences, Karestan C. Koenen, PhD, Epidemiology, Brent Coull, PhD, Biostatistics, Harvard T.H. Chan School of Public Health, Boston, MA, Suzanne C. Segerstrom, PhD, Psychology, University of Kentucky, Lexington, KY, S. Bryn Austin, ScD, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Background: Psychological resilience is characterized by the relative resistance to psychological damage that can occur with exposure to adversity. Both adversity exposure and psychological sequelae have been implicated in deteriorative physiological processes, like dysregulated circulating cortisol. While little research has examined resilience and cortisol, it is plausible that psychologically resilient young adults exposed to early adversity may manifest more normative diurnal cortisol relative to those with psychological distress. Using data from the Growing Up Today Study I (GUTS1), a cohort of individuals followed from adolescence, we assessed the association between psychological resilience and mean salivary cortisol in young adulthood.

Methods: Data are from GUTS1 participants with information on psychological resilience and salivary cortisol (N=870). Using self-report questionnaires, we defined categorical psychological resilience by two domains: 1) adversity exposure before age 18 (yes/no), and 2) psychological health in young adulthood (defined by reporting low psychological distress and high positive affect). Individuals were classified as: *resilient* (adversity exposed with psychological health), *less resilient* (adversity exposed without psychological health), *vulnerable* (no adversity exposure without psychological health), and *psychologically healthy* (no adversity exposure with psychological health; reference). The outcome was mean log-transformed diurnal salivary cortisol across 4 samples from one day. Sex-stratified linear regression evaluated associations of resilience with mean diurnal cortisol, adjusting for a range of covariates.

Results: Based on early adversity exposure and psychological health, 20.6% of the sample were *resilient*, 58.5% were *less resilient*, 13.2% were *vulnerable* and 7.7% were *psychologically healthy*. Adjusting for all covariates, *resilient* versus *psychologically healthy* individuals did not significantly differ in mean log cortisol. However, among women, mean log cortisol was higher among those *vulnerable* relative to those *less resilient* (p=0.04, age adjusted).
Conclusions: Mean diurnal salivary cortisol in young adults did not meaningfully differ among those who exhibited *psychological resilience* versus *psychological health*. Findings hinted at differences by adversity exposure among women with low psychological health.

Individual Abstract Number: 1312
Optimism and Risk of Hypertension: A Target for Primordial Prevention
Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA, Julia K. Boehm, PhD, Psychology, Chapman University, Orange, CA, Andrew R. Allen, MS, Loryana L. Vie, PhD, Tiffany E. Ho, MPH, Psychology, University of Pennsylvania, Philadelphia, PA, Claudia Trudel-Fitzgerald, PhD, Hayami Koga, MD, Social and Behavioral Sciences, Harvard T. H. Chan School of Public Health, Boston, MA, Lawrence M. Scheier, PhD, Martin E. Seligman, PhD, Psychology, University of Pennsylvania, Philadelphia, PA
Background: Optimism is associated with reduced cardiovascular disease risk. However, few prospective studies have investigated whether optimism is specifically associated with lower hypertension risk and whether the relationship differs by gender or race/ethnicity. Certain populations have been identified as having elevated risk of high blood pressure early in life. One at-risk population is U.S. service members. We investigated whether optimism was associated with lower risk of developing hypertension in an initially healthy sample of soldiers; we tested age, gender, and race/ethnicity as potential effect modifiers.
Methods: Participants were 101,825 hypertension-free adults from a cohort of U.S. Army Active Duty soldiers. We assessed optimism, sociodemographic factors, and health behaviors and conditions in 2009-2010. Incident hypertension was defined by clinical measures of systolic/diastolic blood pressure, physician-diagnosed hypertension, or use of antihypertensive medication. Follow-up assessments of hypertension occurred annually through 2014. We used Cox proportional hazards regression models to estimate hazard ratios (HR) and 95% confidence intervals (CI), while considering covariates including army rank, number of deployments, and health-related factors.
Results: 15,837 incident hypertension cases occurred over a mean follow-up of 3.49 years. The highest vs. lowest optimism level was significantly associated with a 32% reduced risk of incident hypertension when adjusting for age (HR=0.68; 95% CI=0.64-0.72). This relationship remained statistically significant after adjusting for all covariates (HR=0.82; 95% CI=0.77-0.87). A dose-response relationship was evident with each increase in optimism associated with lower relative risk (p for trend < 0.001). Higher optimism was associated with lower risk of developing hypertension in both men and women; effects were somewhat stronger in blacks vs. whites and soldiers older vs. younger than 30.
Conclusions: In a diverse cohort of men and women service members potentially at risk for early onset hypertension, greater optimism was associated with reduced hypertension risk independently of sociodemographic and health factors. Such protective associations are remarkable, given the young and healthy population. Findings suggest optimism is a health asset and a potential target for public health interventions.

Individual Abstract Number: 1779
Childhood Disadvantage and Inflammation: An Examination of Psychological Buffers Among Black and White Americans
Jennifer Boylan, PhD, Health and Behavioral Sciences, University of Colorado Denver, Denver, CO, Jenny M. Cundiff, PhD, Psychogy, University of Alabama, Tuscaloosa, AL, Thomas Fuller-Rowell, PhD, Human Development and Family Studies, Auburn University, Auburn, AL, Carol D. Ryff, PhD, Psychology, University of Wisconsin Madison, Madison, WI
Background: The socioeconomic environment in childhood has lasting impacts on health into adulthood, and chronic inflammation is a biological mechanism posited to link low socioeconomic status (SES) in childhood to disease outcomes in midlife. Prior research has shown that positive psychological factors mitigate the association between low SES and inflammation, although these associations have been demonstrated in largely non-Hispanic White samples. The current study tests race differences in the links between childhood socioeconomic disadvantage and inflammation in midlife. Purpose in life, conscientiousness, and optimism are also tested as buffers of the associations between childhood disadvantage and inflammation in both Whites and Blacks.
Methods: Data were from Midlife in the United States (MIDUS) participants who participated in biological data collection as part of MIDUS 2 and the MIDUS Refresher Survey. Socioeconomic disadvantage in childhood was measured as a composite of parental education, perceived financial status relative to others, and welfare status. Higher values reflect more disadvantage in childhood. Outcomes include IL-6 and CRP.
Results: Childhood disadvantage predicted higher IL-6 and CRP among Whites, but not Blacks. For Black participants, higher conscientiousness and purpose in life, but not optimism, predicted lower IL-6. For White participants, all psychological resources were correlated with lower IL-6, and purpose in life also predicted lower CRP. Patterns for psychological factors buffering associations between childhood disadvantage and inflammation were largely similar across race. For inflammatory outcomes, childhood disadvantage was associated with elevated IL-6 and CRP only among individuals with low purpose in life, conscientiousness, and optimism. Disadvantage and inflammation were not associated among those with high purpose in life, conscientiousness, and optimism.
Conclusions: Results suggest that psychological resources are similarly, or even more strongly, protective against childhood disadvantage in both Blacks and Whites. These findings add to a growing literature documenting physiological dysregulation associated with experiencing socioeconomic disadvantage early in life and point to the protective role of psychological resources as mitigating factors in the context of socioeconomic disadvantage across race.

Symposium 1247
Thursday, March 7 from 9:30 to 10:45 am

From body to mind (and vice versa) via heart rate variability
Luca Carnevali, PhD, Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, , Italy, Elena Makovac, PhD, Centre for neuroimaging sciences, King's college London, London, , United Kingdom, Andy Schumann, Dipl-Ing., Department of Psychiatry and Psychotherapy, Jena University Hospital, Jena, , Germany, Elena Makovac, PhD, Centre for Neuroimaging Sciences, King's College London, London, , United Kingdom, Luca Carnevali,

PhD, Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, , Italy, Lisa Quadt, PhD, Psychiatry, Brighton and Sussex Medical School, Brighton, , United Kingdom, Cristina Ottaviani, PhD, Department of Psychology, Sapienza University of Rome, Rome, , Italy

The body and the mind are closely linked and affect each other. Not only can psychological factors precipitate several physical disorders, but also our thoughts and emotions change, and respond to, the state of the body. The existence of this bidirectional association suggests that common physiological pathways may be involved. Recently, at the forefront of psychophysiological research into the body–mind connection has been the study of heart rate variability (HRV), a surrogate measure of cardiac autonomic influences. Evidence suggests that people are more resilient – physically and emotionally – when their resting measures of HRV are higher. Moreover, HRV is considered a promising measure of autonomic reactivity to nociceptive stimulation. Notably, an increase in HRV has been observed in healthy individuals during non-invasive stimulation of the prefrontal cortex and stimulation of the vagal afferent system (such as via HRV biofeedback), which are two promising interventions for the treatment of clinical depression and chronic pain disorders. This symposium illustrates the view that HRV measures of autonomic function are a crucial factor to consider in the study of the reciprocal influences between the mind and the body in healthy and clinical populations. First, changes in functional connectivity of the brain are investigated following HRV-biofeedback training in healthy subjects to reveal potential neural mechanisms underlying the mood-enhancing effects of this intervention. Second, the association between HRV and descending pain inhibition is explored in a healthy sample to investigate the neural mechanisms of intrinsic pain regulation. Then, the effects of HRV enhancement via excitatory stimulation of the prefrontal cortex during psychosocial stress exposure is evaluated in the context of successful coping in healthy subjects. As for clinical populations, autonomic correlates of the negative affective consequences of loneliness are explored in autistic individuals. Overall, the present symposium suggests that the study of autonomic function through HRV may increase knowledge about the mechanisms of the bidirectional body-mind link and may elucidate potential avenues of intervention for conditions in which psychological factors impact on the expression of physical symptoms and vice versa.

Individual Abstract Number: 1448

The influence of an 8-week biofeedback intervention on heart rate variability and functional brain connectivity

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Previous studies have indicated that biofeedback interventions influence heart rate (HR) and its variability (HRV). However, underlying mechanisms are still elusive. Here, we investigated whether changes in HRV induced by a HRV-biofeedback training (HRVBF) are accompanied by altered functional brain connectivity in healthy subjects. HRVBF was applied over eight weeks in order to enhance HRV in 14 healthy subjects (7 females; 30.4±9.3y). HR was assessed by a chest belt (H10; Polar Electro) and displayed on their mobile phone (EliteHRV 4.2.1, Elite HRV LLC). In four sessions per week, subjects trained at home to synchronize their breathing pattern with their cardiac rhythm. Once weekly, participants performed another training session in our lab after assessment of autonomic function at rest. A control group with 10 subjects (5 females; 30.0±12.6y) played three different *jump'n'run* games instead of performing the biofeedback training. Functional magnetic resonance imaging sessions were conducted before and after the intervention in both groups. Resting state functional connectivity (RSFC) of the ventromedial prefrontal cortex (PFC) to other brain regions was compared before and after the intervention. The HRVBF group showed a drop of HR by 5.5 beats/min and an increased RMSSD as a measure of HRV by 10.1ms (33%). RSFC of the PFC increased mainly to the right anterior insula, the dorsal anterior cingulate cortex and the dorsolateral PFC due to HRVBF when compared to changes in the control group. Decreases of HR after HRVBF correlated with increases of PFC-connectivity to the right anterior insula (R^2=.33, $p<.05$). Our results show that increased vagal modulation induced by HRVBF is accompanied by changes in functional connectivity of the brain during resting state.

Individual Abstract Number: 1471

The association between pain-induced autonomic reactivity and conditioned pain modulation is mediated by the periaqueductal grey

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The interaction between the autonomic nervous system (ANS) and pain is an important component of intrinsic pain regulation. Acute pain increases autonomic arousal. By contrast, high blood pressure and greater low-frequency heart rate variability (LF-HRV) are linked to higher pain tolerance, highlighting the existence of a homeostatic regulative mechanism of pain perception. Nociception is also modulated by 'top-down' processes occurring in brain, brainstem and spinal cord. Diffuse noxious inhibitory control (DNIC) is engaged by a tonic painful conditioning stimulus, which can suppress incoming nociceptive signals arising from a second acute stimulus at a different body site. Conditioned pain modulation (CPM) is a widely-used paradigm for assessing DNIC in humans. An association has been also described between autonomic arousal and CPM. Although the periaqueductal grey (PAG) is involved both in DNIC and autonomic regulation, its role in mediating the relationship between the ANS and pain has not yet been explored. Here, 18 healthy volunteers took part in two experimental sessions. In session one, participants underwent two six-minute resting state fMRI scans: i) pain-free; ii) cold-pain (2?C) applied to the forearm. Heart rate data were also simultaneously acquired. In session two, participants performed a CPM task, during which they rated painful pressure stimuli applied to their thumbnail, either alone or in the presence of contralaterally-applied simultaneous painful cold stimulation. A PAG region-of-interest was used for seed-based fMRI analyses. Inter-beat-intervals were artifact-corrected and LF-HRV was extracted for further correlation analyses. We demonstrate that LF-HRV is negatively associated with CPM response; while experiencing simultaneous cold pain, the magnitude of the reduction in subjective responses to evoked pressure pain was greater in individuals with higher LF-HRV. PAG- ventral-medial prefrontal cortex (vmPFC) functional connectivity correlated positively with LF-HRV. Connectivity in these regions negatively correlated with the magnitude of the CPM response. Importantly, PAG-vmPFC connectivity mediated the HRV-CPM association. These complex inter-relationships offer preliminary support for linkages between the brain, ANS and endogenous pain control which may be insightful for future therapeutic development.

Individual Abstract Number: 1248

The effects of excitatory tDCS over the left dorsolateral prefrontal cortex on autonomic and neuroendocrine responses to psychosocial stress

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Prolonged or repeated activation of the stress response can have harmful psychological and physical effects. Recent evidence has supported the notion that autonomic and neuroendocrine stress response systems receive inhibitory influences by cortical structures such as the prefrontal cortex. This top-down modulation may play a major role in the autonomic and neuroendocrine changes associated with stressful events. In this study, we aimed at further investigating this hypothesis by increasing prefrontal cortex excitability using transcranial direct current stimulation (tDCS) - a non-invasive, neuromodulatory tool that induces polarity-dependent changes in cortical excitability. Thirty healthy right-handed male participants were randomized to receive either active anodal (excitatory) tDCS (n = 15) or sham stimulation (n = 15) over the left dorsolateral prefrontal cortex (DLPFC) immediately before and during the performance of a psychosocial stress test. Short- and long-lasting autonomic and neuroendocrine changes induced by psychosocial stress exposure were assessed using heart rate variability (HRV) and salivary cortisol measures, respectively. We found that one single session of excitatory tDCS over the left DLPFC (i) reduced heart rate and increased HRV prior to stress exposure, (ii) moderated stress-induced heart rate acceleration and HRV reduction, but (iii) had no effect on stress-induced cortisol release. However, excitatory tDCS over the left DLPFC prevented stress-induced long-lasting changes in the cortisol awakening response. Finally, participants receiving excitatory tDCS reported a reduction in their levels of state anxiety upon completion of the psychosocial stress test. In conclusion, the present study provides first insights into the efficacy of one single session of excitatory tDCS over the left DLPFC in attenuating autonomic and neuroendocrine effects of psychosocial stress exposure. These findings might be indicative of the important role of the left DLPFC, which is a cortical target for non-invasive brain stimulation treatment of depression, for successful coping with stressful stimuli. Because an exaggerated stress response is known to precipitate mental and physical disorders, these results might have important clinical implications.

Individual Abstract Number: 1543

Loneliness in autism: Autonomic and affective correlates

Lisa Quadt, PhD, Hugo D. Critchley, PhD, Sarah N. Garfinkel, PhD, Psychiatry, Brighton and Sussex Medical School, Brighton, United Kingdom

Background

Feelings of loneliness can have detrimental effects on both physical and mental health. Previous studies show that rates of loneliness are higher in autistic individuals compared to control groups. It is possible that loneliness in this population may reflect feelings of 'solitude' and may not be associated with distress. In this study, we used a large sample of autistic adults to quantify the relationships between levels of loneliness, distress at being lonely, affective symptomatology and physiological measures, with a particular focus on heartrate (HR) and heartrate variability (HRV).

Methods

Participants (N=62) were high functioning autistic individuals (average IQ 112 ± 7.89) between the ages of 18-64 (average age 35 ± 12.71). Self-report measures assessed state and trait anxiety severity (STAI), depression severity (PHQ-9), feelings of loneliness (UCLA Loneliness Scale), and distress about loneliness (questions added to UCLA-LS to signal distress for each item). Additionally, we calculated average HR and measures of HRV. We used two separate multivariate linear regression analyses to quantify the relationship between the loneliness scales (loneliness and loneliness distress) and our affective and physiological variables.

Results

A multivariate regression with two predictors explained 52,6% of the variance of loneliness-distress (R^2=.526, F=26.084, p<.001). Specifically, loneliness-distress had a significant positive relationship with trait anxiety (β=.70, t=6.97, p<.001) and a significant negative relationship with average heartrate (β=-.23, t=-2.30, p=.02). Furthermore, a separate multivariate regression with two predictors explained 40,5 % of the variance of feelings of loneliness (R^2=.405, F=18.374, p<.001). Loneliness has a significant positive relationship with both depression (β=.30, t=2.22, p=.03) and trait anxiety (β=.39, t=2.83, p=.006).

Conclusion

Our findings indicate levels of loneliness and loneliness-distress are strongly coupled to affective symptomatology in ASC individuals. Loneliness-distress is furthermore related to heartrate as an autonomic physiological trait, which may indicate a physiological manifestation of the negative affective consequences of loneliness. Together these findings highlight the need to find effective therapeutic interventions that focus on co-morbid diagnoses in ASC individuals.

Symposium 1306
Friday, March 8 from 4:10 to 5:25 pm

Respiration at the mind - body interface: Basic findings and treatment applications

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Respiration is essential in maintaining the gas exchange of the organism, which is vital for the functioning of peripheral organs and the brain. It is also the only basic vital function that is both involuntary and can be manipulated at will. This makes it an exquisite target for the study of mind - body relationships in basic research and treatment applications. Through its connection with the somatic nervous system maladaptive breathing patterns such as hyperventilation can be learned, but also unlearned, through corrective training. The mechanics and immunology of the respiratory system can also be affected in respiratory illnesses such as asthma. Although the exploration of mind - body relationships in asthma has made progress in recent years, its interactions with brain function, chemistry, and structure has only just begun. Similarly, treatments for psychosocial influences on asthma are in their infancy. This symposium aims to shed light on some of these perspectives of inquiry into respiration at the mind-body interface. Hyperventilation associated with anxiety and stress occurs in health and many clinical conditions, including cases in which individuals faint in medical procedures such as blood draws. Evidence is presented for potential benefits of brief instructions to reduce ventilation. Breathing at a particular slow rate appears to confer a wide range of emotional, cognitive, and clinical benefits across a multitude of chronic conditions, as suggested by a meta-analysis to be presented. Brain

imaging findings suggest a specific burden of asthma, and its management, on gray matter of subcortical structures and on neuronal health. There are indications that asthma also alters the central nervous system processing of emotional stimuli, and identification of mechanisms involved in such influences presents major research challenges for coming years. Finally, identification of the parasympathetic pathway of bronchoconstriction in negative affect has opened up perspectives on treatment of stress-induced asthma symptoms with agents that modify vagal outflow to the airways.

Individual Abstract Number: 1320

Effects of Hyperventilation and Brief Respiratory Training on Vasovagal Reactions to Blood Donation

Blaine Ditto, Ph.D., Serena Mennitto, B.S., Johanna Harrison, B.S., Psychology, McGill University, Montreal, QC, Canada, Thomas Ritz, Ph.D., Psychology, Southern Methodist University, Dallas, TX, Pierre Robillard, M.D., Medicine, Hema-Quebec, Montreal, QC, Canada, Christopher France, Ph.D., Psychology, Ohio University, Athens, OH

Background: People undergoing medical procedures are often advised to "take a deep breath" to deal with stress. Many use this strategy without instruction, which is to some degree supported by research. On the other hand, excessive exhalation of carbon dioxide, i.e., hyperventilation, can be produced by increased tidal volume as well as respiration rate, and may lead to cerebral vasoconstriction. Hyperventilation may contribute to stress-related vasovagal symptoms such as dizziness and syncope.

Method: 547 young adult blood donors at mobile university clinics wore portable respiratory capnometers that measured respiration rate and end tidal CO_2. Self-report ratings of anxiety were obtained following registration and in the post-donation recovery area. A number of indices of vasovagal symptoms were assessed including self-report ratings of vasovagal symptoms of dizziness, etc. and whether or not the nurse initiated treatment for a vasovagal reaction. One-fourth of the participants underwent blood donation-as-usual with no intervention aimed at reducing vasovagal symptoms. Another ¼ were asked to breathe in a regular but shallow manner during blood donation following a brief, 5-minute pre-donation intervention (RESP). One-fourth practiced the muscle-tensing technique Applied Tension (AT) and another ¼ practiced both RESP and AT.

Results: Controlling for age, gender, body mass index, and baseline CO_2, the degree of decrease in average CO_2 from the registration area to the donation chair was significantly negatively associated with anxiety reported in the waiting area but not the post-donation recovery area. Donors who had greater decreases in CO_2 also had higher vasovagal symptom scores and were more likely to be treated by the nurses for a vasovagal reaction. Respiration rate was not associated with these variables, suggesting that changes in tidal volume were involved. On the other hand, the effects of the respiration intervention were mixed. RESP produced significant reductions in both vasovagal symptoms scores and nurse-initiated treatment, but only in donors with lower Medical Fear Survey scores. The most likely explanation is that the brief intervention was insufficient for somewhat more fearful donors.

Conclusion: In general, the results suggest that the "vasovagal" response is not purely a cardiovascular event and may involve interactions between cardiovascular and respiratory processes.

Individual Abstract Number: 1376

Effects of depression on airway function in asthma: exploring neural and immune pathways

Bruce D. Miller, MD, Psychiatry and Pediatrics, Heather K. Lehman, MD, Pediatrics, Beatrice L. Wood, PhD, Psychiatry and Pediatrics, University at Buffalo, Buffalo, NY

Background: Depression is seen more frequently in asthmatics compared to the general population, and is associated with unfavorable asthma outcomes. These include increased emergency room visits, hospitalizations, and asthma-related death. There is evidence that comorbid depression is associated with decreased responsiveness of asthma to traditional bronchodilators or corticosteroids. There is also evidence that depressed children with asthma show increased vagal/cholinergic mediated airway reactivity to stress. The purpose of this study is to test the following hypotheses: 1. Asthmatic children with depression show less atopic/immune sensitization; 2. Asthmatic children with depression will show greater responsiveness to anticholinergic brocholidators, and less response to albuterol.

Methods: Twenty-five asthmatic children ages 7 to 17 years were evaluated for depressive symptoms using the Child Depression Inventory (CDI). Markers of inflammation included exhaled nitric oxide (FeNO) and peripheral blood eosinophils (PBE). Atopic status and allergic sensitization were evaluated by total serum IgE (TSE) and skin prick testing (SPT) to environmental allergens.Children performed spirometry before and after ipratropium and before and after albuterol to assess their differential response to anticholinergic vs beta-adrenergic treatment, respectively.

Results: There was no association between CDI scores and skin tests, FeNO, and absolute eosinophils. Higher CDI scores trended towards decreased Total IgE ($r=-0.329;p=0.183$). Higher CDI scores were associated with greater spirometry response to ipratropium, ($r=0.361;p=0.076$). Furthermore higher CDI scores trended towards decreased spirometry response to albuterol ($r=-0.266;p=0.285$). There was no difference between depressed and non-depressed asthmatic children with respect to markers of inflammation or atopic status. However, depressed asthmatic children appeared to show less allergic sensitization. Depressed asthmatic children showed preferential airway response to anticholingeric inhaled treatment over traditional beta-adrenergic treatment.

Conclusion: These findings demonstrate that the vagal/cholinergic pathway importantly mediates the effect of depression on airway function in asthma. This indicates the importance of screening for depression in order to target treatments for asthmatic children.

Individual Abstract Number: 1552

Exploring central nervous system processing of emotion in asthma: potential for a blunted neural response

Juliet L. Kroll, MA, Psychology, Southern Methodist University, Dallas, TX, Amy E. Pinkham, Ph.D., School of Brain and Behavioral Sciences, The University of Texas, Dallas, Dallas, TX, Dave A. Khan, MD, Internal Medicine, Changho Choi, PhD, Radiology, E. Sherwood Brown, MD, PhD, Psychiatry, The University of Texas Southwestern Medical Center, Dallas, TX, Thomas Ritz, PhD, Psychology, Southern Methodist University, Dallas, TX

Background: While affective and emotional states are identified as relevant to the exacerbation, duration, and frequency of asthma disease processes, the role of the central nervous system in processing affect in asthma remains relatively unknown. First studies with asthma samples observe within group associations of increased neural activation in the hippocampus and amygdala during stress associated with greater cortisol response to a stressor and airway inflammation. Yet, in response to stressors, asthma samples have demonstrated cortisol hyporesponsiveness compared to non-asthmatic controls. Along these lines, reduced activity in limbic regions during the processing of negative affect has been associated with greater airway inflammation in asthma. To date, replication studies have not been conducted and it is unclear if these neural responses are distinct to asthma.

Methods: We therefore examined, with a combined HPA-axis, functional magnetic resonance imaging and magnetic resonance

spectroscopy study, potential brain mechanisms involved in the processing of negative films in asthma patients and non-asthmatic controls.
Results: There were no group differences on self-report measures of affect; however, asthma patients demonstrated lower activation in the right lingual and left inferior frontal gyri compared to non-asthmatic controls, while watching negative films. We also observed a blunted cortisol awakening response (CAR) in asthma participants compared to controls, controlling for medication use. Exploratory analyses identified that higher CAR was associated with smaller gray matter volume in the left nucleus accumbens in the entire sample, which was no longer significant when examining asthma patients only. Furthermore, patients with higher CAR demonstrated higher levels left hippocampal Cho/Cr, an indicator of increased cellular turnover.
Conclusion: Together, these findings indicate the potential for a generally dampened neural response to negative films and HPA-axis activity in asthma patients compared to controls. Exploratory analyses highlight the potential for reduced strength in neuro-endocrine associations in asthma. Future study with larger samples and a broader range of affective stimuli is necessary to explore differential asthma specific neural responses. Partial funding was provided by the National Institute of Aging R24AG048024.

Individual Abstract Number: 1591
Subcortical gray matter volume in asthma: Associations with disease history, fear of asthma, clinical outcomes, and anxiety response to stress-induction
Thomas Ritz, Ph.D., Juliet L. Kroll, MA, Psychology, Southern Methodist University, Dallas, TX, Sina Aslan, Ph.D., Radiology, David A. Khan, M.D., Internal Medicine, UT Southwestern Medical Center, Dallas, TX, Amy E. Pinkham, Ph.D., Psychology, UT Dallas, Dallas, TX, E. Sherwood Brown, M.D., Ph.D., Psychiatry, UT Southwestern Medical Center, Dallas, TX
Background: Chronic obstructive pulmonary disease and anxiety have been linked to reduced volumes of gray matter in subcortical structures of the limbic system and basal ganglia. However, studies are missing that have examined such effects in asthma specifically. In this chronic inflammatory condition with variable episodes of airway obstruction such effects are likely to unfold over the course of the illness.
Method: We therefore studied in a sample of individuals with asthma (age: 18-45 years) associations between subcortical gray matter volumes and illness duration, medical control of the illness, catastrophic fears of asthma and its exacerbations, and anxiety responses to stress-induction by films. High-resolution T1-weighted MRI structural scans were processed with FSL's FIRST program to determine gray matter volumes of amygdala, hippocampus, putamen, pallidum, caudate nucleus, nucleus accumbens, and thalamus.
Results: Compared to age and gender-matched healthy controls, no deficits in subcortical gray matter volume were detected. Controlling for gender, age, and corticosteroid inhaler use in those with asthma, longer illness duration, lower asthma control, higher exhaled nitric oxide (as a proxy for airway inflammation), and more catastrophic thoughts about asthma and asthma exacerbations were associated with lower gray matter volumes in amygdala, putamen, and pallidum. Similarly, lower volumes of the pallidum were associated with stronger anxiety responses to stressful film sequences.
Conclusion: Already in a mostly young group of asthma patients, aspects of the illness, including history, clinical control, and emotional responding to the illness and to stressful stimuli are reflected in gray matter volumes of limbic and basal ganglia structures. Although causal inferences cannot be drawn, the findings are partly suggestive of an influence of the illness on the integrity of subcortical structures.

Individual Abstract Number: 1647
Training in slow (6/min) breathing improves general resilience
Paul M. Lehrer, PhD, Psychiatry, Rutgers Robert Wood Johnson Medical School, Piscataway, NJ, Karenjot Kaur, BA, Psychology, Ferkauf Graduate School Yeshiva University, Bronx, NY
Background: Breathing at the resonance frequency of the cardiovascular system, about 6 times/minute on average, is known to strengthen the baroreflexes and improve respiratory gas exchange efficiency. These events occur because of phase relationships among breathing, heart rate, and blood pressure that occur when people breathe at this unique frequency, thereby affecting limbic system centers connected to baroreflex control. Training in this method by heart rate variability biofeedback or simple paced breathing has been found to produce significant improvements in a number of conditions and measures including hypertension, asthma, COPD, pain, anxiety, depression, and various signs and symptoms of stress. It also has been found to improve athletic performance.
Method: In order to test the effect of these procedures on general resilience, we performed a meta analysis on all controlled studies of this method, from Medline, PsycInfo, The Rutgers University library of databases.
Results: Forty-seven studies met criteria for random assignment to treatment and control groups and report of sufficient data on at least one outcome measure. The wide variety of measures ranged from human performance to negative emotion and functional aspects of physical disease. Averaged across studies of all conditions and across all measures taken in each study, we found a highly significant ($p <$ .0001) low to medium effect size (Hedges g = 0.266). Although heterogeneity was highly significant p < .0001 there sere no influential outlying studies. When only inactive control groups were included the effect size was slightly higher (g = 0.388).
Conclusion: The results of this analysis suggest that training in paced breathing at resonance frequency can improve general resilience. Meta analyses on specific outcome measures will also be presented.

Symposium 1335
Saturday, March 9 from 1:45 to 3:15 pm

LGBT Health
Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, Mark L. Hatzenbuehler, PhD, Sociomedical Sciences, Columbia University, New York, NY, Travis Salway, PhD, Public Health, University of British Columbia, Vancouver, BC, Canada, Wilson Figueroa, PhD, Psychology, The Ohio State University, Columbus, OH, Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, L. Zachary DuBois, PhD, Anthropology, University of Oregon, Eugene, OR
Lesbian, gay, bisexual, and transgender (LGBT) people are vulnerable to stress and disease because of the stigma. As a whole, adolescent and adult LGBT people are anywhere from 1.5 to 4 times more likely to self-report depression, anxiety, suicidal ideation/attempts, substance abuse, eating disorders, risky sexual behaviors, homelessness, and victimization than heterosexuals. To date, however, the biological mechanisms associated with these health disparities have rarely been studied among LGBT populations using biopsychosocial approaches.
Sexual minority stress models propose that the stress of living in environments that stigmatize minority sexual orientations contribute to later health disparities. At the macro-level, structural stigma represents the social conditions, cultural norms, and institutional policies that constrain the opportunities, resources, and wellbeing of the stigmatized. Sexual minority stress also applies to the

understudied experiences of gender minorities like transgender and gender fluid people who face unique challenges in societies that often denigrate gender non-conformity. Indeed, transgender people are at ultra-high risk of health problems. For all members of society, stressful environments can damage physiological health. Emerging research on LGBT health has focused on assessing stress physiology among LGBT individuals to identify targets of intervention, but also as a means of furthering our understanding of how LGBT-related stigma, stress, and strain can 'get under the skin and skull' or be resisted among resilient individuals.
The goal of our symposium is review sexual and gender minority stress models and emerging findings that assess LGBT health using stress biomarkers. Our first presentation will review the state of the literature related to sexual minority stress model in relation to health behaviors. Our second empiricial presentation by Dr. Zoccola will present new findings that tease apart LGBT stress and non-LGBT stress in relation to diurnal cortisol. Our third presentation by Dr. Juster will review the state of the literature on stress biomarkers in LGBT health research. This sympsium will be rejoined by remarks by Dr. Hatzenbuehler who has led this field forward with his pioneering research on structural stigma.

Individual Abstract Number: 1684
Minority stress theory turns 15: A systematic review of associations between minority stress constructs and mental health outcomes among sexual minorities
Travis Salway, PhD, Public Health, University of British Columbia, Vancouver, BC, Canada, Shayan Asadi, N/A, Unknown, York University, Toronto, ON, Canada, Martin Plöderl, PhD, Psychology, Paracelsus Medical University, Salzburg, Austria
In 2003, Meyer published a seminal theory attributing the elevated risk of mental distress and related outcomes among sexual minorities to a stress process model, which includes distal (e.g., enactments of stigma) and proximal (internalized stigma, expectations of rejection, concealment of sexuality) sexual minority-specific stressors. Over the subsequent 15 years, multiple empirical studies applied minority stress models to sexual minority samples. The magnitudes of resultant measures of association between specific minority stress constructs and outcomes have varied widely—likely owing to between-study differences in sample characteristics, settings, and measures used. The objective of this systematic review is to synthesize empirical studies of minority stress in sexual minority samples in order to: (a) identify consistency in associations between minority stress constructs and specific mental health outcomes; (b) explore variables that moderate associations between minority stress and mental health outcomes; (c) quantify the proportion of variability in outcomes explained by minority stress; and (d) suggest changes to the minority stress model.
A three-pronged search strategy is used to identify sexual minority stress literature: (1) keyword database searches (PubMed, PsycInfo, Scopus, Google Scholar, CINAHL, EMBASE); (2) reference lists of resultant articles; (3) contacting key experts. Quantitative studies that test minority stress constructs in association with depression, anxiety, suicide ideation/attempts, or substance use, in sexual minority samples, will be included. Two independent reviewers will screen and select texts. Magnitude of effects will be estimated used Cohen's *d*, correlation coefficients, and binary ratios, as appropriate; effect measures will be tabulated by construct and outcome (objective a). Between-study variability in associations will be examined using stratification by gender, age, country, and other available covariates (objective b). The proportion of within-study variability in mental health outcomes explained by minority stress will be quantified using R^2, where reported (objective c). Data extraction and analysis are ongoing and will be completed by March 2019. We will offer reflections on empirically-informed amendments to the minority stress model (objective d).

Individual Abstract Number: 1666
LGBT Stress, non-LGBT Stress, and Diurnal Cortisol: Examining the Effects of Daily Stressors on Diurnal Cortisol in a Sample of Sexual Minority Young Adults
Wilson Figueroa, PhD, Psychology, The Ohio State University, Columbus, OH, Peggy Zoccola, PhD, Andrew Manigault, MS, Psychology, Katrina R. Hamilton, MS, MPH, Psychology and Osteopathic, Matt C. Scanlin, Ms, MPH, Ryan C. Johnson, PhD, Psychology, Ohio University, Athens, OH
Stigma and discrimination are prevalent in the lives of sexual minorities and may contribute to existing health disparities between sexual minorities and heterosexual persons. Minority stress may contribute to poor health by dysregulating stress response systems, including diurnal cortisol rhythms. However, few studies have examined the association between sexual minority stress and diurnal cortisol in lesbian, gay, bisexual, and transgender (LGBT) individuals. The aim of the current investigation was to test whether the daily experience of minority stressors is uniquely related to diurnal cortisol above and beyond general stressors. One hundred and twenty-one sexual minority young adults (aged 18-35, 54.5% female, free of major psychiatric or endocrine disorders) completed initial and daily evening questionnaires for seven consecutive days. A randomly selected subset (n = 58) also provided salivary cortisol samples at wake, 45 minutes post-wake, 12 hours post-wake, and at bedtime. All participants reported on daily general stressors and LGBT stressors as part of the nightly surveys. Controlling for covariates (sex, wake time, bed time, and day of the week) and general stressors, individuals who reported more LGBT stressors across the week displayed elevated cortisol levels at wake ($t(491) = 9.68$, $p = .002$) and 45 minutes post-wake ($t(492) = 6.41$, $p = .011$), relative to individuals who reported fewer LGBT stressors. When only controlling for covariates (not other forms of daily stress), frequency of LGBT stressors continued to predict waking cortisol levels ($t(508) = 5.87$, $p = .015$) but not cortisol levels 45 minutes post-wake ($t(509) = 2.65$, $p = .10$). In contrast, after controlling for covariates, the frequency of general stressors did not predict either waking ($t(506)=.11$, $p= .73$) or 45 minutes post-wake cortisol ($t(506) = .36$, $p = .53$). Diurnal cortisol was unrelated to day-to-day LGBT and general stressors (comparing each day to a person's weekly average). Results imply that the daily experience of everyday minority stressors is uniquely related to diurnal cortisol and may have implications for the mental and physical health of LGBT adults.

Individual Abstract Number: 1336
Stress Biomarker Research Among Lesbian, Gay, Bisexual, and Transgender People
Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Montreal, QC, Canada, ALi Weinstein, PhD, Global and Community Health, George Mason University, Farfax, VA, Eli Puterman, PhD, Kinesiology, University of British Columbia, Vancouver, BC, Canada, Mark Hatzenbuehler, PhD, Sociomedical Sciences, Columbia University, New York, NY
In 2011, the Institute of Medicine published a timely report on the health inequalities of lesbian, gay, bisexual, and transgender (LGBT) individuals that effectively galvanized research on stress-disease processes. Across the board, LGBT individuals are more vulnerable to various physical and mental health problems due to stigma. And yet, the health and well-being of LGBT populations has rarely been investigated using psychobiological methods commonly applied in Psychosomatic Medicine. In this presentation, we provide a scoping literature review of the existing literature on stress biomarkers among

LGBT individuals. A review was conducted using PubMed, Google Scholar, and Scopus search engines. The majority of studies have focused on diurnal cortisol, with some studies assessing immune, cardiovascular, and metabolic biomarkers that are often used in allostatic load studies. This is a small but growing literature of relevance to members of the American Psychosomatic Society. To summarize, emerging research assessing LGBT-related stigma has fallen into two camps: (1) between group analyses whereby LGBT profiles are assumed to differ from heterosexuals because of sexual/gender minority stress that is not actually measured or (2) within-group analyses only among sexual minorities who differ in their self-reports of sexual/gender minority stress. Between-groups analyses of young adults from Canada and the United States have found no disparities in diurnal cortisol profiles when contrasting sexual minorities to heterosexual individuals. In contrast, within-groups analyses of internalized stigma have consistently been associated with hypersecretion of diurnal cortisol among LGBT individuals with one exception. In conclusion, measuring LGBT-specific stigma may be a prerequisite to detecting variability in diurnal cortisol profiles and perhaps also other stress-related biomarkers.

Individual Abstract Number: 1842
Geopolitical and Psychosocial Indicators of Perceived Distress, Mental Health, and Allostatic Load Among Transgender Men
L. Zachary DuBois, PhD, Anthropology, University of Oregon, Eugene, OR, Robert-Paul Juster, PhD, Psychiatry and Addiction, University of Montreal, Monreal, QC, Canada
As a result of social inequality and stigma, transgender individuals endure high rates of discrimination and distress that may adversely effect their physical and mental health. Only recently has the connection between social experience and health been assessed using stress biomarkers among transgender individuals. To further address this, transgender men (N = 65; age: M = 31.8, SD = 9.1) were recruited from Vermont and Massachusetts. Based on in-depth interview data, we coded indices representing (1) progressive geopolitical climate based on rural/suburban/urban/college town location and conservative/progressive political inclination (4 items); (2) socio-demographic advantage (8-items); (3) social support and resources (10 items); (4) transgender-specific stressors (11-items); and (5) unhealthy behaviors (6 items). The Perceived Stress Scale and an index of psychological symptoms was also assessed. Allostatic load indexed neuroendocrine (cortisol awakening response, diurnal area under the curve with respect to ground until bedtime), immune (C-reactive protein, Epstein-Barr virus), cardiovascular (24-hour systolic and diastolic blood pressure and heart rate), and metabolic (body mass index, fat, triceps) functioning. Regressions revealed that perceived stress and psychiatric symptoms were negatively correlated with progressive geopolitical climate (respectively B = -1.47, p = 0.19; B = -.77, p < .001) but positively correlated with more transgender-specific stressors (respectively B = 1.51, p < .001; B = .38, p = .005). Allostatic load was negatively associated with progressive geopolitical climate (B = -.55, p = .007) and socio-demographic advantage (B = -3.2, p = .001). These preliminary findings suggest that experiencing more transgender-specific stressors (e.g., stress/challenges with health professionals, public restrooms, legal name changes) is linked to more perceived distress and poorer mental health. Despite recruitment from liberal states in the U.S., those living in less progressive geopolitical climates and with less socio-demographic advantage evidenced higher allostatic load. Our findings support the notion that nuancing multi-level factors that contribute to physical health and psychological wellbeing among transgender individuals shows promise to help us better understand health disparities among highly marginalized populations.

Symposium 1346
Thursday, March 7 from 1:15 to 2:15 pm

Emotional Awareness and Chronic Pain: Theoretical, Basic Science, and Treatment Advances
Mark A. Lumley, PhD, Psychology, Wayne State University, Detroit, MI, Richard D. Lane, M.D., Ph.D., Psychiatry, University of Arizona, Tucson, AZ, Alla Landa, PhD, Psychiatry, Columbia University Medical Center, New York, NY, Mark A. Lumley, PhD, Psychology, Wayne State University, Detroit, MI, Christoph Herrmann-Lingen, M.D., Psychosomatic Medicine and Psychotherapy, University of Göttingen Medical Center, Göttingen, , Germany
Chronic pain and other somatic symptoms are related to dysfunctional emotional processes. Deficits in people's emotional awareness and experiencing can lead to problems in emotional identification, expression, and processing, which appear to trigger or augment somatic symptoms. Advances in theory, basic science, and applied research are needed to help translate our knowledge of these affective processes to the improvement of patients' health. This symposium brings together a diverse group of scholars to address various aspects of the link between emotional unawareness and chronic pain. The first speaker will present on a theoretical model explaining neurobiological mechanisms underlying possible biased competition between physical and emotional pain, and how these mechanisms may be involved in the link between early adversity and chronic pain. The second speaker will present her Developmental Theory of Somatoform/Centralized Pain and data from research demonstrating the dynamics of interpersonal distress, autonomic functioning (heart rate variability), and verbal emotional expressiveness/alexithymia among patients with centralized chronic pain, which has implications for treatment. The third speaker will present the results of several clinical trials of a therapy designed to enhance emotional awareness and expression for people with centralized chronic pain, and data on alexithymia and emotional awareness as moderators of the treatment's effects. Finally, a discussant will examine the presentations from the perspective of both an international scholar with a broad view of psychosomatic medicine as well as that of a practicing psychosomatic physician. This symposium will advance the field's recognition and understanding of the vital role of emotional unawareness in chronic pain and other somatic symptom disorders, and encourage the development, testing, and implementation of interventions to improve emotional awareness and reduce such symptoms.

Individual Abstract Number: 1487
Biased Competition Favoring Physical Over Emotional Pain: Possible Neurobiological Mechanisms Explaining the Link Between Early Adversity and Chronic Pain
Richard D. Lane, M.D., Ph.D., Psychiatry, University of Arizona, Tucson, AZ, Frances S. Anderson, Ph.D., Trauma Studies Program, Manhattan Institute for Psychoanalysis, New York, NY, Ryan Smith, Ph.D., Laureate Institute for Brain Research, University of Tulsa, Tulsa, OK
Background: Early adversity predisposes to chronic pain, but a mechanistic explanation is lacking. Survivors of early adversity with chronic pain often appear impaired in their ability to be aware of, understand, and express distressing emotions such as anger and fear in social contexts. It has been proposed that pain may at times serve as a "psychic regulator" by preventing awareness of more intolerable emotions.
Method: A foundational premise is that physical and emotional pain are conscious experiences that can compete for selective attention.

We highlight mechanisms whereby the consequences of early adversity may put emotional pain at a competitive disadvantage. An evidence-based neurobiological model is presented.
Results: A cognitive-developmental model of levels of emotional awareness will be reviewed. It is proposed that abuse or neglect in childhood is associated with impaired emotional awareness, i.e. limitations in the adult capacity to attend to and/or conceptualize the emotional meaning of felt distress. This may be associated with impaired engagement of the default network and impaired top-down modulation of affective response generation processes. Persistent and poorly conceptualized affective distress may be associated with reduced emotion regulation ability, reduced vagal tone, increased inflammation, and amplified nociceptive signals. Attention to physical pain may be reinforced by the temporary reduction in negative emotions that it causes.
Conclusions: These processes jointly promote biased competition favoring attention to physical pain and away from one's own emotions. They may constitute an unintentional analogue of the phenomenon of self-injury in patients with borderline personality disorder in whom the intentional infliction of physical pain serves to down-regulate intense emotional distress. Attending to, expressing, and understanding previously unacknowledged psychological distress unrelated to pain may facilitate recovery from chronic pain following early adversity.

Individual Abstract Number: 1363
Can Expressed Interpersonal Distress Reverse the Effects of Early Interpersonal Adversity on Somatoform/Centralized Pain? On Neuropsychophysiologic Mechanisms of Symptom Formation and Implications for Treatment
Alla Landa, PhD, Psychiatry, Columbia University Medical Center, New York, NY, Anthony Bossis, PhD, Psychiatry, Laura Boylan, MD, Neurology, NYU School of Medicine, New York, NY, Andrew Hartz, MA, Clinical Psychology, Long Island University, Brooklyn, NY, John Dall'Aglio, BA candidate, Psychiatry, Columbia University, New York, NY, Philip Wong, PhD, Clinical Psychology, Long Island University, Brooklyn, NY
Background: Research based Developmental Theory of Somatoform/Centralized Pain (S/CP) (Landa et al., 2012) suggests that early interpersonal adversity(EIA) interacts with multigenerational factors leading to neural predisposition to S/CP. Interpersonal affect regulation between infant and caregiver is crucial for optimal maturation of nervous system; EIA may impede development of capacities for emotion-somatic sensation differentiation, awareness, expression and regulation of emotions, leading to experiencing distress in somaticaly. These mechanisms of symptom formation suggest that psychotherapies targeting development of these capacities can help treat S/CP; studies show that psychotherapies that focus on emotion expression and working through interpersonal traumas can alleviate S/CP. However, the exact neurophysiologic mechanisms underlying these effects are not yet fully understood. In our previous study, 90% of S/CP patients (vs 10% of controls) presented with the Unmet Need for Closeness with Others (UNCO) as main representation of relationships. We now present the data on autonomic regulation (HRV) and verbally expressed emotions/alexithymia during patient's interviews on interpersonal relationships.
Methods: Twenty patients with S/CP from Pain, Neurology, and Primary Care clinics, and 20 age-, sex-, ethnicity-, and level of education-matched healthy controls completed the Relationship Anecdotes Paradigm (RAP)-a semi-structured interview coded for representations of relationships (Core Conflictual Relationship Theme method). HRV was measured continuously during RAP. RAP narratives were coded for Verbally Expressed Emotion using coding method adapted from Levels of Emotional Awareness Scale.
Results: S/CP patients had higher levels of UNCO and RAP alexithymia, and significant increase in HRV during RAP vs controls. Relationship between these dimensions and history of interpersonal traumas will be explored.
Discussion: Talking about interpersonal relationships and expressing UNCO to others was associated with HRV increase among S/CP patients, which has direct implications for psychophysiologic mechanisms underlying change in psychotherapeutic interventions for S/CP, therefore helping reverse effects of EIA suggested by the Developmental Theory of S/CP. Implications for diagnosis and treatment of S/CP will be discussed.

Individual Abstract Number: 1347
Emotional Awareness and Expression Therapy for Chronic Pain: Outcomes and Emotion-focused Moderators
Mark A. Lumley, PhD, Psychology, Wayne State University, Detroit, MI, Howard Schubiner, MD, Internal Medicine, Ascension Health / Providence Hospital, Southfield, MI, David Williams, PhD, Anesthesiology, University of Michigan Medical Center, Ann Arbor, MI, Elyse Thakur, PhD, Medicine, Baylor University, Houston, TX, Maisa Ziadni, PhD, Pain Medicine, Stanford University, Palo Alto, CA, Hannah A. Holmes, MA, Psychology, Wayne State University, Detroit, MI, Jennifer Carty, PhD, Family Medicine, Michigan State University, Flint, MI
Background: Patients with somatoform or centralized pain conditions have elevated levels of adverse life events, psychological conflicts, and subsequent deficits in adaptive emotional awareness and expression. The most popular treatments for chronic pain, however, do not address these risk factors. Therefore, we developed Emotional Awareness and Expression Therapy (EAET), which directly targets these affective deficits with the goal of reducing pain and other symptoms.
Methods: Our team has conducted several recent randomized, controlled trials of EAET for patients with pain conditions. These trials vary in target population, control / comparison conditions, and EAET format and duration. Secondary analyses of pre-treatment alexithymia, emotional awareness, and emotional expressivity are tested as potential moderators of EAET's effects.
Results: We found that: a) 8-session group EAET was superior to education control and partially superior to CBT for fibromyalgia; b) 3-session individual EAET was superior to wait-list control and equal or superior to relaxation training for irritable bowel syndrome; and c) 1-session individual EAET was superior to wait-list control for primary care patients with somatoform pain disorders. EAET reduced pain/ somatic symptoms in all of these trials. Secondary moderator analyses indicate that alexithymia interfered with EAET's effects in the fibromyalgia trial, but that EAET effects were not dependent on baseline emotional expressivity in the IBS trial. Ongoing analyses of baseline emotional awareness and alexithymia as potential moderators will be presented.
Conclusions: EAET is a potentially powerful novel treatment for patients with somatoform or centralized pain conditions because it directly addresses the emotional awareness and expression deficits that are commonly found in these patients. It remains unclear whether EAET is especially useful for patients who have sufficient baseline emotional abilities, or is more generally helpful to a wide range of patients.

Symposium 1362
Saturday, March 9 from 1:45 to 3:15 pm

Mechanisms of Posttraumatic Stress Disorder and Cardiovascular Disease: Is It the Chicken or the Egg?

J. Douglas Bremner, M.D., Psychiatry & Behavioral Sciences and Radiology, Emory University School of Medicine, Atlanta, GA, Viola Vaccarino, M.D., Ph.D, Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, Donald Edmondson, Ph.D., Behavioral Medicine, Columbia University, New York, NY, Viola Vaccarino, M.D., Ph.D, Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, Beth Cohen, M.D., Medicine, University of California San Francisco, San Francisco, CA, Zahi A. Fayad, M.D., Medicine (Cardiology), Icahn School of Medicine at Mount Sinai, New York, NY

Posttraumatic Stress Disorder (PTSD) is highly prevalent among patients with Coronary Artery Disease (CAD) and is associated with worse outcomes, but the underlying mechanisms for this association are unclear. This panel examines new research in the emerging field of CAD and PTSD which can inform research in these two areas, both in terms of understanding physiology as well as advancing clinical science. Dr. Edmondson will present data from Emergency Room settings showing an increase in PTSD in patients who present with acute cardiovascular events, addressing issues of cause and effect. Dr Vaccarino will present cardiac imaging data from twins discordant for PTSD showing an increase in CAD in PTSD patients and examining sleep and autonomic function, as well as data on mechanistic factors involved the phenomenon of mental stress-induced myocardial ischemia using cardiac and brain imaging and measurement of stress-induced biomarkers. Dr Cohen will present longitudinal data on the relationship between CAD and PTSD. Dr Fayad will present his work innovative work combining multiple imaging modalities of the brain, peripheral vasculature, and cardiovascular system to understand mechanisms by which stress and PTSD increase risk for CAD, with applications to patients with comorbid disorders. This symposium represents the latest research on the topic of CAD and PTSD from the leaders in the field of this emerging and exciting new area which has potential implications for patients suffering from both disorders.

Individual Abstract Number: 1364

"PTSD in Patients with Acute Coronary Syndromes and Cardiovascular Disease: What Comes First?"

Donald Edmondson, Ph.D., Behavioral Medicine, Columbia University, New York, NY

Background: The Enduring Somatic Threat (EST) model of posttraumatic stress disorder (PTSD) due to life-threatening medical events suggests that PTSD-like symptoms reflect, in large part, patients' sensitization to cues of ongoing threat in the body. Meta-analyses suggest that 12-30% of survivors of acute life-threatening cardiovascular disease (CVD) events screen positive for PTSD due to the CVD event, and that CVD-induced PTSD is associated with increased secondary CVD and mortality risk. Emergency department (ED) factors such as overcrowding and poor clinician-patient communication influence PTSD risk, but no study has tested whether CVD management strategies influence PTSD risk. The EST model suggests that perceived CVD recurrence risk is the core determinant of CVD-induced PTSD, so interventions that reduce patients' perceived CVD risk may reduce PTSD. Invasive coronary revascularization procedures are commonly used to reduce secondary ACS risk, and may reduce patients' EST perceptions, as revascularized patients are 4 times more likely to report being "cured" compared to medically managed patients (i.e., no invasive procedure; prescribed medications to reduce secondary CVD risk).
Methods: To test the association of patients' threat perceptions during ED evaluation and CVD management strategy with subsequent PTSD, we enrolled 143 patients during ED evaluation for their first acute coronary syndrome (ACS; i.e., non-ST elevation myocardial infarction or unstable angina- colloquially, "heart attack"). We assessed participants' initial threat perceptions (e.g., fear of dying, feelings of vulnerability, lack of control) during ED evaluation using the ED perceptions questionnaire (Cornelius et al., in press), and followed them for 1 month for PTSD symptoms (PCL-specific for ACS, by telephone). We compared PTSD symptoms in participants who were revascularized (N = 65), catheterized but not revascularized (N = 35), or medically managed (N = 43); abstracted from the electronic medical record. Linear regression models were adjusted for age, sex, ACS type (NSTEMI vs unstable angina), GRACE cardiac risk score, Charlson medical comorbidity index, EDWIN ED crowding score, pre-existing PTSD due to pre-hospital trauma by PCL-C, and pre-existing depression by PHQ-9.
Results: Unadjusted 1-month CVD-induced PTSD symptoms were lower for revascularized versus medically managed participants, B = -5.32, 95% CI [-9.77, -0.87], p = .020, and ED threat perceptions strongly predicted CVD-induced PTSD in the full sample, B = 0.59, 95% CI [0.13, 1.05], p = .012. In a multiple regression model adjusted for clinical and psychosocial covariates, the interaction of threat perception in the emergency department (ED) and ACS management group was significant (greater ED threat predicted greater 1-month PTSD symptoms only in medically managed participants).
Conclusions: Our findings offer further support for the EST model, and suggest that psychological interventions to preempt patients' development of EST (and thereby PTSD) should be considered in-hospital. High resting state amygdala activation is associated with incident CVD risk, partly through inflammatory pathways, and patients with PTSD evince high rs-amygdala activation. Future studies should test whether revascularization procedures reduce patients' secondary CVD risk perceptions, and whether low risk perceptions are associated with reduced rs-amygdala activation and secondary CVD risk.

Individual Abstract Number: 1365

Posttraumatic Stress Disorder after Myocardial Infarction: Onset and Pathways of Risk

Viola Vaccarino, M.D., Ph.D, Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, Bruno Lima, M.D., Muhammad Hammadah, M.D., Medicine (Cardiology), Emory University School of Medicine, Atlanta, GA, Amit J. Shah, M.D., Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, Paolo Raggi, M.D., Medicine (Cardiology), University of Alberta, Edmonton, AB, Canada, Arshed A. Quyyumi, M.D., Medicine (Cardiology), J. Douglas Bremner, M.D., Psychiatry & Behavioral Sciences and Radiology, Emory University School of Medicine, Atlanta, GA

Background: Posttraumatic Stress Disorder (PTSD) is prevalent among patients who survived an acute myocardial infarction (MI), and is associated with adverse outcomes. It is unclear whether PTSD is a cause or a consequence of the MI, and the mechanisms linking PTSD to adverse outcomes are similarly unknown. We examined these questions among young and middle-aged MI patients and community controls. We hypothesized that PTSD would be more prevalent in the MI patients than in controls, and that MI patients with PTSD would have higher levels of stress-induced inflammatory biomarkers and a higher probability of abnormal myocardial perfusion (ischemia).
Methods: We studied 303 patients ≤60 yrs who were hospitalized for MI in the previous 8 months and 112 community controls matched for sex and age to the MI patients. A clinical diagnosis of PTSD (lifetime and current) was obtained using the Structured Clinical Interview (SCID) for DSM IV and the date of PTSD onset was recorded. Mental stress was induced by a speech task, and interleukin 6 (IL-6) was measured at rest and 90 minutes after mental stress.

Patients received ^{99m}Tc-sestamibi myocardial perfusion imaging at rest, with mental (speech task) and with conventional (exercise/pharmacological) stress. A summed difference score (SDS), the difference between stress and rest scores, was used to quantify ischemia under both stress conditions. Mental stress-induced ischemia (MSIMI) was defined as an SDS ≥3, and conventional stress ischemia (CSIMI) as an SDS ≥4. The number of ischemic segments was also obtained. Linear and Poisson models were used for analysis.
Results: The sample was 50% female and 59% black, with mean age of 50 yrs. The lifetime prevalence of PTSD was three times higher in patients (14.5%) than controls (4.5%, p<0.005), and PTSD was mostly current (10.9% in patients and 3.6% in controls). For all patients except one, PTSD onset was before the MI, and in most cases (70%) it begun > 10 years prior to the MI. PTSD was related to early life and adult trauma, but not to MI severity indicators. Patients with PTSD had an enhanced IL-6 response to mental stress, which was more marked for current PTSD (127% increase from rest) than remitted PTSD (72% increase) compared with no PTSD (63% increase), p
Conclusions: In young and middle-aged individuals, PTSD is more likely a risk factor than a consequence of MI. Higher inflammatory and ischemic responses to mental stress represent potential pathways that may link PTSD status to adverse outcomes post-MI.

Individual Abstract Number: 1366
Longitudinal Assessment of PTSD and Cardiovascular Disease"
Beth Cohen, M.D., Medicine, Thomas Neylan, M.D., Psychiatry, Mary Whooley, M.D., Medicine, University of California San Francisco, San Francisco, CA
Background: Patients with posttraumatic stress disorder (PTSD) are at increased risk of developing cardiovascular disease, leading to decreased quality of life, impaired function, and early mortality. However, some have questioned whether the association of PTSD and CVD is truly causal and the potential mechanisms linking these two conditions remain unclear.

Methods: To prospectively evaluate the association of PTSD and cardiovascular disease, we recruited 746 patients from San Francisco area Veterans Affairs Medical Centers between 2008 and 2010 to participate in a longitudinal cohort, the Mind Your Heart Study. We assessed PTSD with the Clinician Administered PTSD scale (CAPS) and evaluated baseline cardiovascular status with resting echocardiography and exercise treadmill testing. To evaluate potential mechanisms, we collected information on demographics, medical history, and health behaviors with standardized questionnaires. We measured multiple inflammatory biomarkers from fasting blood draws and catecholamines from 24-hour urine collection. At Year 5, a subset of participants (n=112) returned to repeat baseline procedures. They also completed a standardized assessment of brachial artery flow mediated vasodilation as an additional objective measure of cardiovascular risk. We contact participants each year for telephone interviews to measure PTSD symptoms and assess cardiovascular disease events, including myocardial infarction, unstable angina, stroke, congestive heart failure, revascularization, or emergency room visits for chest pain. We collect medical records for all reported events as well as review VA medical charts to evaluate unreported events. All potential events are adjudicated by two physicians blinded to PTSD status.
Results: At baseline, patients with PTSD were significantly more likely to have myocardial ischemia on exercise treadmill testing than those without PTSD (17% vs. 10%, p=.006). We also observed a dose-response relationship between PTSD symptom severity and prevalence of myocardial ischemia, with risk increasing substantially at a CAPS score of 80, corresponding to moderate to severe PTSD. The association of PTSD and myocardial ischemia remained significant after adjusting for traditional cardiovascular risk factors, behavioral and psychosocial factors (OR=2.02, p=.005). However, additional adjustment for inflammatory biomarkers and catecholamines did reduce the association of PTSD and ischemia (OR=1.80, p=.05). In the sample of patients that returned for Year 5 visits, those with PTSD at baseline were more likely to have incident ischemia (37% among PTSD, 16% among controls, p=.11; age-adjusted OR 3.09, p=.12) and had lower flow-mediated vasodilation (age-adjusted β -1.11, p=.21). Patients with PTSD have also reported significantly more prospective cardiovascular events (93 vs. 54 events per 1,000 person-years, p=.03). We are currently adjudicating all potential events and plan to present these updated results.
Conclusions: This study provides objective and longitudinal evidence supporting PTSD as a causal risk factor for cardiovascular disease. Greater inflammation and sympathetic nervous system activity may play a role in increasing risk. We will discuss the implications of these findings for prevention of cardiovascular disease in patients with PTSD.

Individual Abstract Number: 1367
Novel Multi-modality Imaging of the Brain, Peripheral Vasculature and Cardiovascular System in Patients with PTSD on Cardiovascular Disease
Zahi A. Fayad, M.D., Medicine (Cardiology), Icahn School of Medicine at Mount Sinai, New York, NY
Psychological or psychosocial stress can negatively impact quality of life by causing maladaptive physiological immunological, and behavioral alterations. Recent studies have shown that psychological stress can activate neuroendocrine pathways and consequently alter immune responses. Recent basic work has shown that stress caused by, for example, myocardial infarction or psychosocial dynamics, promotes inflammation in atherosclerotic mice. These stressors increase hematopoietic progenitor cell migration and proliferation, thereby increasing the systemic monocytes/macrophage supply. Sympathetic nervous signaling changes the hematopoietic milieu in the bone marrow and thereby elevates monocyte production in the spleen and marrow. Studies have also shown that stress-induced alterations in microglia phenotype and monocyte priming lead to aberrant peripheral and central inflammation. Post-traumatic stress disorder (PTSD), triggered by exposure to extreme psychosocial stress, has been linked to elevated inflammation, including rheumatoid arthritis. Its relationship with coronary heart disease and other cardio-metabolomic findings have also been previously examined. PTSD is associated with dysregulation in microRNA expression and immune function and is associated with autonomic dysfunction as well. I will present work on how we plan to examine extreme psychosocial stress in individuals afflicted with PTSD. We will examine vascular inflammation non-invasively using 18-F-fluorodeoxyglucose (18F-FDG) positron emission tomography (PET), and we will measure atherosclerotic burden by MRI. Moreover, we will evaluate the links among the brain, the hematopoietic system, and atherosclerosis. Specifically, we will compare how resting activity versus fear circuit activation in the brain (using 18F-FDG-PET and fMRI) influence cellular metabolic activity in both the vasculature and hematopoietic organs using non-invasive positron emission tomography combined with magnetic resonance imaging (PET/MRI). These observations will be correlated with both circulating inflammation biomarkers and multi-parametric FACS that will provide insights into cell trafficking. This innovative approach to evaluating the cardiovascular system, brain and hematopoietic organs and their connections should provide breakthrough insights into how psychosocial stress causes atherosclerosis.

Symposium 1384
Friday, March 8 from 11:30 am to 12:30 pm

Unpacking the Influence of Stress on Sleep: Do Emotion and Stressor Characteristics Play a Role?
Kate A. Leger, PhD, Psychology, University of Kentucky, Lexington, KY, Brooke N. Jenkins, PhD, Psychology, Chapman University, Orange, CA, Kate A. Leger, PhD, Psychology, University of Kentucky, Lexington, KY, Brooke N. Jenkins, PhD, Psychology, Chapman University, Orange, CA, Aric A. Prather, PhD, Psychiatry, University of California, San Francisco, San Francisco, CA, Martica H. Hall, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA
Poor sleep is predictive of a broad number of negative health outcomes such as coronary heart disease, diabetes, major depressive disorder, and even mortality. Given the importance of this health behavior, understanding the psychosocial factors that impact sleep could produce critical health benefits. For example, stress and emotion have been shown to shape how well someone sleeps. Consequently, a growing literature is beginning to dissect associations between both laboratory-based and daily life stressors and sleep behavior, but questions remain regarding the role of emotion in shaping the connection between stress and sleep, as well as the directional nature of these effects. Further, specific types of stressors (e.g., discrimination, laboratory-based stressors, exam stress) have not been examined individually. In this symposium, speakers will present data exploring different facets of the relationship between stress, emotions, and sleep. The first speaker uses a laboratory-based study to examine the relationship between self-reported sleep and prolonged positive and negative affective recovery from a stressful task. The second speaker will elaborate on the stress buffering nature of positive affect in the context of stress and sleep in daily life. The third speaker will further explore associations between stress and sleep in daily life by examining longitudinal effects of discrimination stress on sleep quality in Latinx college students. The discussant, a distinguished sleep researcher, will facilitate a discussion integrating the findings from the three presentations and highlight implications for future directions in stress and sleep research. In conclusion, this symposium brings together both experimental and daily diary research designs to elaborate on the impacts of stress and emotion on sleep.

Individual Abstract Number: 1386
Affective Recovery from Stress and its Associations with Sleep
Kate A. Leger, PhD, Psychology, University of Kentucky, Lexington, KY, Susan Charles, PhD, Psychological Science, University of California, Irvine, Irvine, CA
Prolonged affective recovery from stress is detrimental to physical health. One way through which prolonged affective recovery from stress may shape health outcomes is through its relationship with sleep. Deficiencies in fundamental aspects of sleep have been shown to influence a broad range of negative health outcomes. The current study examined both positive and negative affective recovery from a laboratory-induced stressor and their associations with self-reported sleep behavior. Participants were 118 undergraduate students (age range 18 to 25) who engaged in a laboratory psychosocial stress task. Participants reported their affect at baseline, during the procedure, and after a 6-minute recovery period. Results revealed that both positive and negative affective recovery were related to sleep, although different aspects of sleep. Prolonged negative affect recovery was associated with worse sleep quality (b = -0.14, p = .04) whereas prolonged positive affect recovery was associated with worse sleep efficiency (b = -0.17, p = .04). Findings suggest that prolonged affective recovery from stress is associated with poor sleep and point to the relationship between affective recovery from stress and sleep and their implications for physical health as an important avenue of future research.

Individual Abstract Number: 1449
The Stress Buffering Effect of Positive Affect on Sleep: Considering Arousal Level of Positive Affect
Brooke N. Jenkins, PhD, Psychology, Chapman University, Orange, CA, Marie P. Cross, MA, Alison Goldstein, MA, Psychological Science, University of California, Irvine, Irvine, CA, Tara Kraft-Feil, PhD, Psychology, CHI St. Alexius Medical Center, Bismarck, ND, Heather Rasmussen, PhD, Educational Psychology, University of Kansas, Lawrence, KS, Michael F. Scheier, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA, Sarah D. Pressman, PhD, Psychological Science, University of California, Irvine, Irvine, CA
Positive affect, encompassing emotions such as joy and happiness, has been shown to promote resilience in a multitude of health contexts, including the health behavior of sleep. Further, positive affect has been shown to buffer against the detrimental effects of stress on sleep. However, one characteristic of positive affect that is often disregarded in the positive affect, stress, and health literature is the arousal level of positive affect. Positive affect is characterized by emotion words (e.g., vigor, full of pep, energetic, lively, happy, pleased, cheerful, at ease, calm, relaxed) and these emotions may be subdivided based on arousal level (e.g., high arousal vigor vs. low arousal calm). However, analyses examining the effects of positive affect type based on arousal level are typically not done. It is possible that arousal level of positive affect could influence sleep differentially and depend on stress level. To test this, we first used confirmatory factor analysis through a structural equation modeling framework to examine the factor structure of a commonly used positive affect scale (Study 1) and then applied this factor structure to affect, stress, and sleep data (Studies 2 and 3). In study 1 (N = 605), we found that the best model for the positive affect subscale was a three-factor structure with vigor (high arousal), well-being (mid arousal), and calm (low arousal) as the three factors (CFI = 0.986, RMSEA = 0.060). In study 2 (N = 99), we applied this factor structure to positive affect to assess the impact of arousal level on sleep during stress (a college exam). Results demonstrated that the night before a college exam, students with higher vigor and well-being experienced better sleep efficiency. Surprisingly, calm led to *worse* sleep in terms of duration of minutes slept. In study 3 (N = 83), we used daily diary data and found that at high levels of stress, high trait vigor and well-being were associated with better sleep efficiency and quality. In contrast, it was day-to-day state calm that led to better sleep efficiency on days with higher stress. In conclusion, we uniquely demonstrate that arousal types of positive affect as well as trait versus state are differentially associated with better sleep outcomes at night.

Individual Abstract Number: 1422
Impact of perceived and anticipated discrimination on global sleep quality among Latinx young adults
Aric A. Prather, PhD, Amie M. Gordon, PhD, Psychiatry, University of California, San Francisco, San Francisco, CA, Tessa Dover, PhD, Applied Social Psychology, Portland State University, Portland, OR, Kathy Espino-Perez, PhD, Psychology, Wake Forest University, Winston-Salem, NC, Payton Small, BA, Brenda Major, PhD, Psychological and Brain Sciences, University of California, Santa Barbara, Santa Barbara, CA
The experience of discrimination is associated with impairments in physical and mental health outcomes, including decrements in sleep quality. However, prior investigations have largely been cross-

sectional in nature, have failed to account for concurrent negative affect, and rarely tested differential influences of perceived vs. anticipated (race-based vigilance) discrimination. The present study investigated prospective associations between perceived and anticipated discrimination on global sleep quality in a sample of 273 Latinx undergraduates (age range 18-20 years; 70.8% female; 64.4% first generation college student). at the beginning of their freshman year of college and followed over the academic year. Using a cross-lagged panel model with latent variable, prospective analyses revealed that participants who reported greater perceived discrimination during their first quarter of college showed a significant decline in their global sleep quality over their academic year (B=0.14, p<0.05). Importantly, this association held after adjusting for correlations between perceived discrimination and global sleep quality at each study time point and concurrent measures of negative affect, including neuroticism and symptoms of anxiety and depression. Notably, anticipation of discrimination (i.e., vigilance) also predicted poor global sleep quality over time supporting unique effects of perceived and anticipated discrimination on sleep quality (B=0.15, p<0.02). Finally, there was significant, albeit less robust, prospective association between poor global sleep quality predicting increases in the perceptions of discrimination over time (p=0.04). Taken together, these data indicate that greater perceptions and anticipation of discrimination are related to longitudinal decrements in global sleep quality, which may help explain racial disparities in academic success, as well as mental and physical health outcomes observed among young adults.

Symposium 1385
Thursday, March 7 from 2:30 to 3:45 pm

The Future of Smartphones and Mobile Devices in Biobehavioral Science

Carissa A. Low, PhD, Medicine, University of Pittsburgh, Pittsburgh, PA, Charles Jonassaint, PhD, Medicine, University of Pittsburgh, Pittsburgh, PA, Carissa A. Low, PhD, Medicine, University of Pittsburgh, Pittsburgh, PA, Charles Jonassaint, PhD, Medicine, University of Pittsburgh, Pittsburgh, PA, John Hunter, MA, Psychological Science, University of California - Irvine, Irvine, CA, Emily K. Lindsay, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Eva Szigethy, MD, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA

The majority of American and Canadian adults own a smartphone, and the average user spends over four hours per day interacting with their device. Smartphones have dramatically transformed the way we spend our time, access information, and communicate with others. The implications of these changes for health care and behavioral research are just beginning to be examined. The presentations in this symposium will highlight novel ways that smartphones and other mobile devices can be used to assess patient-reported and behavioral processes as well as how they may be used to buffer stress and deliver evidence-based interventions. The first presenter will describe how smartphone and wearable sensor data may be useful in monitoring postoperative symptoms, inflammatory activity, and readmission risk. The second presenter will present a novel tablet-based tool that uses graphic visualizations and animations to assess pain quality, intensity, and course. The third presenter will discuss how smartphone presence or use influences physiological stress recovery. Finally, the fourth presenter will show comparable efficacy of smartphone-based and traditional in-person mindfulness interventions for boosting daily positive affect. Together this work highlights the vast potential of smartphones to provide new insights into health and resilience as well as opportunities and challenges in this area.

Individual Abstract Number: 1387

Relationships between Smartphone and Wearable Sensor Data, Symptoms, Quality of Life, and Inflammation after Pancreatic Surgery

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Background: Smartphone and wearable sensor data may provide insight into dynamic behavior patterns indicative of health status. In the context of surgical recovery, these sensors offer a way to monitor sickness behavior such as reduced mobility that may be related to subjective health, inflammatory activity, and clinical outcomes such as readmission.

Objective: The goal of this study was to examine between-subject relationships between smartphone and wearable sensor data, patient-reported symptoms and quality of life, serum interleukin-6 (IL-6), and readmission after pancreatic surgery.

Methods: A total of 51 patients scheduled for pancreatic surgery completed this longitudinal study (M = 64 years, range 39-81, 57% male). Participants carried an Android smartphone, wore a Fitbit Charge2, and completed daily symptom ratings from before surgery until 60 days after hospital discharge, and they provided blood samples and completed quality of life (FACT-Hep) measures at postoperative clinic visits as feasible. Day-level features were extracted from raw smartphone and Fitbit data and included features related to activity and mobility, phone usage patterns, and sleep; the mean of each feature during the first 30 days home after surgery was computed. Information about readmissions within 60 days of index discharge was extracted from electronic medical records. Sample sizes varied across analyses due to missing data for some measures.

Results: Consistent with a sickness behavior model, higher mean postoperative symptom burden was associated with more time at home ($r(34) = .37$, $p = .03$) and shorter active bouts ($r(45) = -.30$, $p < .05$) as well as higher IL-6 levels ($r(19) = .59$, $p = .008$). Higher serum IL-6 levels were associated with longer interactions with the smartphone ($r(19) = .69$, $p = .001$). 28% of patients were readmitted, and those who were readmitted had shorter active bouts ($p < .05$), longer sedentary bouts ($p < .05$), and lower sleep efficiency ($p = .001$).

Conclusion: These preliminary results suggest that some smartphone and wearable sensor data may correlate with other measures of health during surgical recovery. These relationships could be harnessed to develop remote monitoring systems for postoperative patients.

Individual Abstract Number: 1391

I see your pain! Design and development of a novel technology-based tool for communicating and assessing pain that uses animations.

Charles Jonassaint, PhD, Enrico M. Novelli, MD, Medicine, University of Pittsburgh, Pittsburgh, PA

Pain is the #1 reason adults with sickle cell disease (SCD) seek medical care, yet, pain is often poorly assessed and treated in SCD. Accurate assessment of pain is necessary for providing the correct treatment but current paper-pencil measures have limited clinical utility for guiding care; measures that are reliant on word descriptors and numeric scales that don't accurately capture the pain experience.

Our team set out to develop and test a pain assessment tool that leverages technology and allows patients to more effectively communicate their pain.
METHODS. We first conducted qualitative interviews to understand how patients communicate their pain to clinicians and use traditional pain scales. From this work, we concluded that an effective pain assessment tool requires a highly visual, abstract, and expressive mode of communication—animations. Working with user-centered designers and animators, we developed a preliminary set of 8 pain animations based on frequently used adjectives for describing pain. We then developed a tablet-based app called Painimation that uses graphical images and animations to assess pain location, quality and intensity.
The feasibility and usability of Painimation is being tested in a clinical study that includes traditional, validated pain measures: the McGill Pain Inventory and PainDETECT, a measure of neuropathic pain. This study is targeting 60 adults with sickle cell disease and has already enrolled 52 participants. The study hypothesizes that Painimation is 1) rated by patients as easy to use and useful and 2) equally as effective for discriminating pain types as traditional pain scales.
RESULTS. From patient interviews, we learned that the pain experience is almost impossible to communicate and interaction with medical providers regarding pain is often frustrating due to misunderstandings. Patients find the 0-10 scale "inadequate" and "useless" while they found the traditional multi-dimensional pain scales difficult to use. Quantitative data results from the cross-sectional survey study of Painimation are forthcoming.
CONCLUSION. Painimation is potentially an easy-to-use tablet-based tool that removes barriers of age, culture, language and literacy level in pain assessment. We will report our design process, development and preliminary data evaluating Painimation alongside other validated patient-reported outcomes measures.

Individual Abstract Number: 1392
Is it your phone or how you use it? An investigation of the benefits smartphones may provide when recovering from stress
John Hunter, MA, Psychological Science, University of California - Irvine, Irvine, CA, Sarah Pressman, PhD, Psychological Science, University of California, Irvine, Irvine, CA
Objectives: Smartphones may provide benefits during times of stress, but how and why they do so is still unknown. Past research has demonstrated that simply having one's phone present procures greater benefits than using one's phone in the context of stress.We go further in this study by examining *how* having a phone present or using a phone freely may influence stress recovery compared to using a specific stress-reducing application on a phone.
Methods: Participants (pilot N=20, target N=150) underwent the Trier Social Stress Task (TSST) and then interacted with their phone in a particular way depending on condition. Those in the *No Phone (control)* condition had no access to their phone. Those in the *Phone Presence* condition had their phone but were restricted from using it. Those in the *Phone Use* condition used their phone in any manner they chose. Those in the *Guided Phone Use* condition used a Heart Rate Variability Biofeedback training application. Participants self-reported stress and provided saliva samples for cortisol and alpha amylase assessments during stress recovery. Change scores from peak stress to 10 minutes after the TSST were considered the primary dependent variables of interest.
Results: Preliminary results from the pilot sample indicate that individuals in the *Guided Phone Use* condition exhibited greater reductions of salivary cortisol salivary cortisol (*M*= -0.13 ug/dl), salivary alpha amylase (*M*=-42.16 U/ml), and self-reported stress (*M*=-14.75) than those in the *Phone Use* condition (*M*=-0.06 ug/dl, *M*=-21.60 U/ml, *M*=-13.40), *Phone Presence* condition (*M*=0.01 ug/dl, *M*=11.63 U/ml, *M*=-5.80), and No *Phone* condition (*M*=-0.02 ug/dl, *M*=-33.12 U/ml, *M*=12.60), respectively.
Conclusions: Results suggest that engaging in Heart Rate Variability Biofeedback training on a smartphone application is more effective at aiding in recovery from stress than using a phone freely, having a phone present, or doing nothing at all. The full study will investigate pathways by which each condition imparts its effects by considering distraction, perceived support, received support, social media use, and feelings of calm as mediators. These results are a critical step in a deeper understanding of how, why, and when smartphones might be good for us in times of stress, which may inform future interventions.

Individual Abstract Number: 1393
Smartphone and in-person mindfulness interventions boost positive emotions through acceptance mechanisms: Evidence from two randomized controlled trials
Emily K. Lindsay, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Shinzen Young, PhD, Psychiatry, University of Vermont, Burlington, VT, Carol Greco, PhD, Psychiatry, University of Pittsburgh, Pittsburgh, PA, Joshua M. Smyth, PhD, Biobehavioral Health, Penn State University, University Park, PA, Kirk W. Brown, PhD, Psychology, Virginia Commonwealth University, Richmond, VA, Aidan Wright, PhD, Psychology, University of Pittsburgh, Pittsburgh, PA, Brian Chin, BA, J. David Creswell, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA
Background: Millions of people use smartphone-based mindfulness training programs to enhance well-being. These programs are more accessible, inexpensive, and scalable than in-person mindfulness interventions, yet few studies have explored their efficacy or active ingredients. We conducted parallel RCTs in smartphone-based and in-person training contexts that experimentally tested the active ingredients of mindfulness interventions. Mindfulness interventions train basic skills in *monitoring* present-moment experiences with a lens of *acceptance*. We hypothesized that learning acceptance skills helps people notice more positive experiences in daily life, and tested whether removing acceptance training from mindfulness interventions would eliminate boosts in positive emotions.
Methods: In two RCTs of stressed adults, mindfulness skills were dismantled into two structurally equivalent interventions: (a) training in both monitoring and acceptance (Monitor+Accept) and (b) training in monitoring only (Monitor Only) without acceptance training. Study 1 tested 8-week in-person Monitor+Accept and Monitor Only interventions compared to a no treatment control group. Study 2 tested 2-week smartphone-based Monitor+Accept and Monitor Only interventions compared to an active control training. For three days before and after the interventions, ambulatory assessments were used to measure positive emotions in daily life.
Results: As predicted, both smartphone-based and in-person Monitor+Accept training significantly increased daily life positive emotions compared to both Monitor Only and control groups. Monitor+Accept boosted positive emotions by 21% after two weeks of smartphone training (d=.70, p<.0005) and by 22% after eight weeks of in-person training (d=.70, p<.0005).
Conclusions: Together, these studies show that smartphone-based mindfulness interventions can be equally effective as traditional in-person mindfulness interventions for boosting positive emotions in daily life. Moreover, across intervention contexts, developing an orientation of acceptance toward present-moment experiences is a central mechanism of mindfulness interventions for these effects. Overall, smartphone-based mindfulness programs hold value for increasing well-being in hard-to-reach populations; they reduce barriers associated with intensive in-person programs while delivering similar benefits.

Symposium 1394
Saturday, March 9 from 12:15 to 1:30 pm

Linked lives, bodies, and minds: Health consequences and boundary conditions of physiological similarity and synchrony in close relationships

Stephanie J. Wilson, PhD, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH, Kuan-Hua Chen, PhD, Psychology and Institute of Personality and Social Research, University of California, Berkeley, Berkeley, CA, Kuan-Hua Chen, PhD, Psychology and Institute of Personality and Social Research, University of California, Berkeley, Berkeley, CA, Theresa Pauly, MA, Psychology, University of British Columbia, Vancouver, BC, Canada, Stephanie J. Wilson, PhD, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH, Melissa Gerald, PhD, Division of Behavioral and Social Research, National Institute on Aging, Bethesda, MD

Close relationships profoundly shape how we grow and age—through *linked lives*, according to life course theory. Past work has shown that close dyads can share common health fates, e.g., the same chronic disease diagnoses, all the way down to momentary changes in emotions, brain activity, and autonomic activity during interaction. Yet, many questions remain: under what conditions do physiological synchrony and similarity emerge, and with what consequences for health? This symposium of three papers will probe the moderators and health outcomes of physiological synchrony and similarity at three timescales in caregiving dyads and couples of all ages.

The first presentation examines second-by-second physiological linkage across six autonomic and somatic indices during a conversation between three types of dyads: Alzheimer's disease or behavioral variant frontotemporal dementia patients and their caregivers, as well as healthy control pairs. Provocative results demonstrate the possible role of frontal lobe integrity and patients' anxiety symptoms for caregiving pairs' synchronization.

The next presentation explores the relationship and health implications of daily cortisol synchrony among healthy older couples. Pairing serial saliva samples over seven days with two yearly follow-up assessments, the research links dyadic cortisol synchrony to prospective changes in relationship satisfaction and cholesterol; intriguing findings suggest that cortisol synchrony may have divergent effects on relationship quality and health.

Seeking to bridge work on dyads' momentary synchrony with that on couples' ultimate shared disease risks, the final presentation probes healthy young and middle-aged couples' similarity in cardiometabolic health—fasting glucose, metabolic data, and resting blood pressure. Findings point to the importance of age, closeness, and marital satisfaction in couples' preclinical cardiometabolic similarity, with health behavior concordance and emotional dynamics as possible mechanisms.

The discussant, program director of the Division of Behavioral and Social Research at the National Institute on Aging, will integrate the findings using her relevant expertise in the roles of families and interpersonal relationships on health and well-being in midlife and older age. She will cast results in larger view of high-priority future directions in aging research.

Individual Abstract Number: 1431
Diminished physiological linkage between patients with behavioral variant frontotemporal dementia and their caregivers

Kuan-Hua Chen, PhD, Psychology and Institute of Personality and Social Research, Alice Verstaen, PhD, Casey L. Brown, M.A., Sandy J. Lwi, PhD, Casey J. James, PhD, Marcela C. Otero, M.A., Dyan E. Connelly, M.A., Psychology, University of California, Berkeley, Berkeley, CA, Bruce L. Miller, MD, Neurology, University of California San Francisco, San Francisco, CA, Robert W. Levenson, PhD, Psychology and Institute of Personality and Social Research, University of California, Berkeley, Berkeley, CA

Physiological linkage refers to the degree that physiological responding in two interacting individuals changes in coordinated ways. Increased physiological linkage implies enhanced social engagement, through which individuals can exchange thoughts, intentions, and emotions. Behavioral variant frontotemporal dementia (bvFTD) is a form of dementia associated with profound socioemotional impairment. We hypothesized that, compared to Alzheimer's disease patients (AD; $n = 36$) and healthy controls ($n = 14$), bvFTD patients ($n = 42$) would have diminished physiological linkage with their caregivers during a 10-minute conversation about an area of disagreement. Six peripheral and somatic physiological measures were recorded from both the patients and caregivers. For each measure, we computed the *mean* of the absolute values of second-by-second correlations between patient's and caregiver's physiological responses during the conversation (using a 15-second rolling window). These six *mean* scores were aggregated to form a single physiological linkage index for each dyad. Results indicated that physiological linkage was lower in bvFTD than in AD and control dyads ($ps < .038$). Additionally, within the bvFTD and AD dyads, lower linkage was associated with greater patient anxiety ($r = -.33$, $p = .003$) rated by clinicians using the neuropsychiatric inventory. These effects were robust as they largely remained statistically significant when the analyses adjusted for patient's dementia severity (assessed by Clinical Dementia Rating), medication, disease diagnosis, and patient's and caregiver's overall physiological arousal. These findings provide preliminary evidence that interpersonal connections between patients and their caregivers can be weakened by bvFTD, perhaps through increased anxiety symptoms in the patients.

Individual Abstract Number: 1432
Long-term health and relationship outcomes of physiological synchrony in older couples

Theresa Pauly, MA, Victoria I. Michalowski, MA, Psychology, University of British Columbia, Vancouver, BC, Canada, Denis Gerstorf, PhD, Psychology, Humboldt University of Berlin, Berlin, Germany, Maureen C. Ashe, PhD, Department of Family Practice, Kenneth M. Madden, PhD, Medicine, University of British Columbia, Vancouver, BC, Canada, Christiane A. Hoppmann, PhD, Psychology, University of British Columbia, Vancouver, BC, Germany

Background. Growing research demonstrates that various physiological indices are closely intertwined among partners. Yet, the longer-term consequences of physiological synchrony between partners are not well understood. Some previous work has demonstrated that synchrony is associated with positive relationship indices such as connectedness (Chatel-Goldman, Congedo, Jutten, & Schwartz, 2014). However, other investigations have suggested that frequent transmission of physiological stress responses could undermine partners' health (Ditzen, Hahlweg, Fehm-Wolfsdorf, & Baucom, 2011; Slatcher, 2014).

Methods. Eighty-three older couples (aged 60-87 years) provided saliva samples five times daily for 7 days that were assayed for cortisol. They further reported their relationship quality and provided a blood sample which was analyzed for cholesterol levels up to three times in one-year intervals. Nested data were analyzed using multilevel modelling.

Results. Everyday salivary cortisol was significantly associated between partners across daily life assessments (b = 0.08, p < .01). Higher dyadic cortisol synchrony was associated with higher relationship quality in men at baseline (b = 1.00, p < .05), and a stronger increase in relationship quality among men two years later (b= 0.97 p < .01). In contrast, higher dyadic cortisol synchrony was also related to higher cholesterol levels at baseline (b = 1.73, p = .02), and a stronger increase in cholesterol levels over time (follow-up 1: b = 1.58, p = .04; follow-up 2: b = 1.97, p = .01).
Conclusions. Synchrony may be important for perspective-taking, bonding, and relationship maintenance, particularly in men (Chatel-Goldman et al., 2014; Sbarra & Hazan, 2008). However, being strongly linked to a romantic partner's physiology may also have costs and put older adults at risk of experiencing negative health outcomes due to repeated stress responses (Timmons, Margolin, & Saxbe, 2015). More research is needed to examine the everyday mechanisms of transmission, and to investigate factors that may help older adults capitalize on the (well-being) benefits of physiological synchrony while minimizing the health risks associated with repeated stress exposure through close others.

Individual Abstract Number: 1430
For better and worse? The importance of closeness, satisfaction, and age in spouses' cardiometabolic similarity
Stephanie J. Wilson, PhD, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH, Juan Peng, MS, Biostatistics, Rebecca Andridge, PhD, Public Health, The Ohio State University, Columbus, OH, Lisa M. Jaremka, PhD, Psychological and Brain Sciences, University of Delaware, Newark, DE, Christopher P. Fagundes, PhD, Psychological Sciences, Rice University, Houston, TX, William B. Malarkey, MD, Internal Medicine, The Ohio State College of Medicine, Columbus, OH, Martha A. Belury, PhD, Human Sciences, The Ohio State University, Columbus, OH, Janice K. Kiecolt-Glaser, PhD, Institute for Behavioral Medicine Research, The Ohio State University College of Medicine, Columbus, OH
Spouses share cardiometabolic disease risks: a person's diabetes or hypertension raises the partner's odds for developing the same condition. Many factors likely account for these overlapping risks—choosing a similar partner and sharing health habits, for example. To examine whether partners' physiological similarity extends to preclinical cardiometabolic health and to probe the importance of marital satisfaction, partners' closeness, and age, 43 healthy couples ages 24 to 61 provided fasting glucose, metabolic data (fat and carbohydrate oxidation), and resting blood pressure at two study visits. They also rated marital satisfaction using the Couple Satisfaction Index and closeness with the Inclusion of Other in Self measure. After accounting for the fixed effects of sex, age, and abdominal fat, partners who felt more connected to each other also had more similar rates of carbohydrate oxidation (p < .05) and diastolic blood pressure (DBP, p < .01), compared to those who felt less close. Likewise, happier couples had more similar systolic and diastolic blood pressure (ps < .05), as well as more similar carbohydrate oxidation at a trend level (p = .06), compared to less happy couples. Finally, fasting glucose and DBP (ps < .05) were more similar within older couples compared to younger pairs. In follow-up analyses, greater similarity in activity levels predicted stronger glucose and metabolic resemblance between partners (ps < .001), which partially explained the effect of closeness on metabolic similarity but did not explain the effect of age on closer glucose values. In sum, our data captured preclinical similarities in cardiometabolic health among disease-free couples, which may form the basis for their joint disease risks down the road. Closer, happier, and older couples shared more similar fasting glucose, metabolic data, and blood pressure, and the fact that activity concordance only partially explained these associations suggests that other health behaviors, as well as stress and emotional dynamics, may be at work. Findings suggest that closer, happier relationships may confer both larger health risks and benefits, and increasing age may also raise the stakes.

Symposium 1397
Friday, March 8 from 3:00 to 4:00 pm

New Perspectives on Reducing Stress
Keely A. Muscatell, PhD, Department of Psychology & Neuroscience, UNC Chapel Hill, Chapel Hill, NC, Janine M. Dutcher, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA, Mona Moieni, PhD, Departments of Psychology and Psychiatry & Biobehavioral Sciences, UCLA, Los Angeles, CA, Keely A. Muscatell, PhD, Department of Psychology & Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC, Erica A. Hornstein, PhD, Psychology, UCLA, Los Angeles, CA
Psychological stress has long been recognized in psychosomatic medicine as a major risk factor for a variety of negative physical and mental health outcomes. As such, much previous research has examined how we might reduce stress to enhance these health outcomes. The talks in this interdisciplinary symposium will build on foundational prior work to offer new insights into the mechanisms by which stress reduction interventions may operate, on a neural, physiological, and psychological level. A variety of stress-reduction interventions, from the psychological to the biological, will be discussed, and presentations will focus on a diverse set of mechanisms and stress-related outcomes. First, new work on the neural mechanisms underlying the stress buffering and performance enhancing effects of self-affirmation will be discussed. Next, the psychological and immunological consequences of a novel generativity intervention for older individuals will be presented. Third, data from a recent randomized, double-blind, placebo controlled trial of the beta-adrenergic receptor blocker propranolol and its effects on psychological and physiological responses to acute social evaluative threat will be presented. Finally, a recent project exploring the effects of physical warmth on threat conditioning and the concomitant implications for social support during stress will be discussed. Together, this exciting recent work by four emerging leaders in psychosomatic medicine will bring together a variety of methods and mechanisms to shed new light on ways to reduce stress.

Individual Abstract Number: 1575
Self-Affirmation Reduces Neural Threat Responding and Self-Reported Stress, and Enhances Performance to an Evaluative Stressor
Janine M. Dutcher, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA, Naomi I. Eisenberger, PhD, Psychology, UCLA, Los Angeles, CA, J. David Creswell, PhD, Psychology, Carnegie Mellon University, Pittsburgh, PA
Self-affirmation leads to a variety of benefits under threatening contexts, from reduced physiological stress responding to greater weight loss. Previous work has found that self-affirmation leads to increased neural reward activity, but the effects on neural stress responding have not yet been investigated. Here, we explored the neural mechanism for self-affirmation's stress buffering effects using previously validated self-affirmation and evaluative stress fMRI tasks. In previous work, this stress task led to increased threat-related neural activity in anterior insula and dorsal anterior cingulate cortex, so we hypothesized that self-affirmation (vs. control) would lead to less activity in these regions. Furthermore, we examined whether self-affirmation reduced self-reported stress and improved

performance. 27 undergraduate students completed a 2 (intervention: self-affirmation or control) x 2 (math difficulty: practice or test) within-subjects design. The task included self-affirmation blocks (important personal values) or control blocks (an alphabetize task). After each intervention block, a math block was presented. Practice blocks presented simple math problems, and test blocks presented difficult multiple choice math problems under time pressure. After each test block, participants were also shown purported feedback that they were underperforming relative to their peers. Participants reported how stressful they found each math block. This allowed us to test, within-subjects, if self-affirmation led to less stress, higher math performance, and less neural threat activity compared to control. Consistent with prior work, participants rated test problems as more stressful than practice problems. Furthermore, self-affirmation (vs. control) led to lower stress ratings on test math problems, and more correct answers to test math problems. fMRI analyses revealed that self-affirmation led to significantly less left anterior insula activity to the test math blocks than did control. Taken together, these results suggest that self-affirmation may lead to reduced feelings of stress and enhanced performance because it leads to less neural threat responding. These results are the first to extend self-affirmation's threat buffering effects to neural responding, highlighting a potential neural mechanism for self-affirmation's benefits.

Individual Abstract Number: 1398

Effects of a Generativity Intervention on Inflammation and Well-Being in Older Women

Mona Moieni, PhD, Departments of Psychology and Psychiatry & Biobehavioral Sciences, Michael R. Irwin, M.D., Psychiatry & Biobehavioral Sciences, Teresa E. Seeman, Ph.D., Medicine & Epidemiology, Theodore F. Robles, Ph.D., Matthew D. Lieberman, Ph.D., Psychology, Elizabeth C. Breen, Ph.D., Psychiatry & Biobehavioral Sciences, Stephanie Okimoto, B.A., Clinical & Translational Research Center, Clara Lengacher, B.S., Psychology, Steven W. Cole, Ph.D., Psychiatry & Biobehavioral Sciences, Naomi I. Eisenberger, Ph.D., Psychology, UCLA, Los Angeles, CA

Generativity, or feeling that one has contributed to the well-being of others, particularly younger generations, is associated with better health outcomes, including decreased risk for morbidity and mortality. Despite the importance of generativity for successful aging, it has been understudied in geriatric populations, with limited intervention work and no work examining the impact of generativity on inflammation, an important stress-related physiological outcome. Thus, the aim of this study was to test the first writing-based social psychological intervention aimed at increasing feelings of generativity and examine the impact of such an intervention on inflammatory outcomes, as well as self-reported health and well-being. Older women (aged 60 and over; n=73) were randomly assigned to complete a 6-week generativity condition (sharing life experiences and advice with others) or control condition (writing about neutral, descriptive topics). Blood was drawn pre- and post-intervention to examine pro-inflammatory gene expression. The generativity intervention led to improvements in health and well-being, including decreases in inflammatory biology (as assessed by pro-inflammatory gene expression), decreases in psychological distress, increases in participation in social activities, and more positive expectations regarding aging in the physical health domain. These results suggest that generativity is an important psychosocial factor to study in older adults and that enhancing feelings of generativity may lead to benefits, including the dampening of physiological stress-related responses such as inflammation.

Individual Abstract Number: 1567

Effects of Beta-Adrenergic Receptor Blockade on Psychological and Physiological Responses to Acute Social Stress

Keely A. Muscatell, PhD, Jennifer K. MacCormack, MS, Department of Psychology & Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC, Emma Armstrong-Carter, BS, Department of Education, Stanford University, Stanford, CA, Monica M. Gaudier-Diaz, PhD, Department of Psychology & Neuroscience, Samantha Meltzer-Brody, MD, Department of Psychiatry, Kristen A. Lindquist, PhD, Department of Psychology & Neuroscience, University of North Carolina at Chapel Hill, Chapel Hill, NC

Stress is a well-established risk factor for chronic disease and psychopathology. A large body of evidence has documented that the sympathetic nervous system (SNS), the hypothalamic-pituitary-adrenal axis, and the immune system are key physiological mediators of the link between psychological stress and health outcomes. However, very little experimental work in humans has *manipulated* the activation of these systems to examine their causal role in driving biological and psychological responses to stress. To fill this critical gap in our knowledge, the present study examined the effects of beta-adrenergic receptor (b-AR) blockade on a comprehensive battery of physiological and psychological stress reactivity measures, thus, providing the most thorough test to-date of the role of the SNS in driving stress responses. In a pre-registered, randomized, double-blind, placebo-controlled trial, 90 healthy young adults were given either a 40 mg dose of the b-AR blocker propranolol, or a placebo, before being exposed to an acute psychological stressor (the Trier Social Stress Test). Results indicated that b-AR blockade significantly blunted participants' emotional responses to the stressor, an effect that was mediated by b-AR blockade-induced reductions in SNS reactivity. Further, exposure to the stressor was associated with increases in cortisol and interleukin-6, but propranolol did not attenuate these responses. Together, these results suggest that the SNS plays a critical role in driving psychological responses to stress, while indicating that other mechanisms likely contribute to HPA and inflammatory responses. Data from this project all provide evidence that "body to mind" processes play a critical role in contributing to affective responses to acute stress.

Individual Abstract Number: 1454

Prepared safety as a buffer against stress: Examining the role of physical warmth during fear learning

Erica A. Hornstein, PhD, Naomi Eisenberger, PhD, Psychology, UCLA, Los Angeles, CA

Learning about threatening and safe cues is crucial for navigating the world, yet the process by which this learning occurs is inexact, often resulting in disruptive fears that lead to persistent fear-induced stress. Given the well-known link between stress and negative health outcomes, understanding the characteristics of naturally safe cues and how they may buffer against harmful fear is of paramount importance. Yet, although much is known about prepared fear stimuli--objects or cues that have typically posed a threat to survival, and thus have come to be more easily associated with fear and more resistant to fear extinction--much less is known about the category of prepared safety and what might belong in it. In contrast to prepared fear stimuli, prepared safety stimuli are likely stimuli that have historically enhanced survival, and thus have come to be less easily associated with fear and able to inhibit the fear response. Recently, some of the first-ever research to explore this category revealed that social support figures, who throughout history have provided care, resources, and security, are prepared safety stimuli. Specifically, images of social support figures were shown to less easily become associated with fear and to inhibit the fear response. Interestingly, social support figures also lead to enhanced fear extinction, an effect that is in direct opposition to the effects of typical, learned safety

signals, which are known to prevent fear extinction from occurring. In the current research, two tests were run to determine if another survival-enhancing stimulus, physical warmth, is also a member of the prepared safety category. Results of this work show that this is the case; specifically, physically warm stimuli cannot become associated with fear (n=30) and preliminary findings suggest physically warm stimuli inhibit the fear response (data collection on-going: current n=15, target n=30). Additionally, like social support figures, physically warm stimuli enhance fear extinction, suggesting that members of the prepared safety category may hold properties distinct from typical, learned safety signals, allowing them to not only reduce fear while they are present, but also lead to lasting fear reduction following their removal. Thus, prepared safety stimuli may be uniquely poised to benefit interventions designed to reduce fear and stress.

Symposium 1401
Thursday, March 7 from 2:30 to 3:45 pm

Diet Across the Lifespan: Stress, Metabolic Health, and Cognition

Matt Lehrer, MS, Kinesiology and Health Education, The University of Texas at Austin, Austin, TX, Janet Tomiyama, PhD, Psychology, The University of California, Los Angeles, Los Angeles, CA, Daryl B. O'Connor, PhD, Psychology, University of Leeds, Leeds, , United Kingdom, Matt Lehrer, MS, Kinesiology and Health Education, The University of Texas at Austin, Austin, TX, Ruth M. Barrientos, PhD, Institute for Behavioral Medicine Research, The Ohio State University, Columbus, OH, Misty Hawkins, PhD, Psychology, Oklahoma State University, Stillwater, OK

Suboptimal dietary intake is a leading risk factor for morbidity and mortality. Psychological stress is considered to promote unhealthy eating behaviors, but the manifestation and magnitude of this association is equivocal among both adults and children. Whether stress-induced eating predicts long-term cardiovascular and metabolic health also remains to be seen. In addition to mind-to-body effects on physical health, this symposium also addresses body-to-mind aspects of diet, examining how certain diets may be particularly detrimental to the aging brain, and how effects of unhealthy diets such as weight gain and metabolic dysregulation may in turn impair cognition and the ability to make healthy food choices. Speaker one examines how stress impacts eating behavior in meta-analyses of adults and children. Associations between stress and amount of food consumption, unhealthy food consumed, and healthy consumption are examined for both age groups, and findings indicate that elevated stress is associated with unhealthy eating patterns for both adults and children. Speaker two builds on this research by examining the impact of stress-induced eating on cardiovascular and metabolic health conditions in a prospective cohort study, and whether consumption of specific food types mediates this association. Results suggest that stress eating predicts cardiometabolic conditions nearly 10 years later. Fitting with this year's theme of "Body to Mind," Speaker three examines dietary consequences from an aging perspective, using a rodent model to study the effects of a high-fat diet on amygdala microglia morphology and function in young and aged rats. Results show that a high-fat diet exacerbates the effects of aging on amygdala-dependent memory impairments. The final speaker integrates aspects of these studies by examining the association of adiposity, metabolic function, executive function, and self-regulation among overweight/obese adults, showing that larger waist circumference is associated with compromised glucoregulatory and insulin function, which in turn predicts poorer executive function and self-regulation. These findings suggest a body-to-mind mechanism by which obesity and impaired glucose metabolism undermine the ability to control food choices, perhaps perpetuating a cycle of weight gain, metabolic complication, cognitive deficit, and unhealthy diet.

Individual Abstract Number: 1402

Effects of Stress on Eating Behavior in Adults and Children: Two Systematic Reviews and Meta-analyses

Daryl B. O'Connor, PhD, Deborah Hill, MSc, Rachael Moss, MSc, Faye Clancy, MSc, Bianca Sykes-Muskett, PhD, Psychology, University of Leeds, Leeds, United Kingdom

Background: Research shows that high levels of stress can be associated with increased, decreased or no change in food intake. However, the size and nature of this relationship remains unclear. In addition, the relationship between stress and eating behavior in children and adolescents remains uncertain. Two meta-analytic reviews aimed: (i) to estimate the strength and variability of the association between stress and eating behavior in children and adolescents (aged 8 to 18 years), and in adults and ii) to identify moderators of this relationship.
Methods: Studies were included if they measured stress and included a measure of food consumption (and did not exclusively consist of a clinical or disordered eating sample). All unique studies retrieved were assessed for their eligibility at title, abstract and full text levels following the PRISMA guidelines. The review protocols were registered on PROSPERO.
Results: In the adult review, 45 studies were included (n = 102,655). Preliminary analyses using random-effects modelling found a significant, positive association between stress and overall food intake (g = 0.123, p< .001). Moreover, sub-group analyses showed that stress was positively associated with the consumption of unhealthy foods (g = 0.148, p <.001). Conversely, a negative association was found between stress and healthy food consumption (g = -0.092, p < .001). In the children and adolescent review, 13 studies were included (n = 28,070). The main analyses found that stress was not associated with a change in overall eating behaviors. However, additional analyses showed stress was positively associated with unhealthy eating behaviors in both younger (g =0.283, p < 0.001) and older (g = 0.274, p < 0.001) children. In contrast, stress was negatively associated with healthy eating behaviors in older children (g = 0.384, p < 0.001). Gender, obesity/overweight status, eating style, type of stress measure, type of eating outcome, number of measurement points, study quality and age will be examined as potential moderators.
Discussion: These preliminary findings confirm that higher levels of stress are associated with increased consumption of unhealthy foods and decreased consumption of healthy foods in adults and children. These findings are also concerning as they suggest the impact of stress on unhealthy eating may begin as early as 8 or 9 years.

Individual Abstract Number: 1406

Stress Eating Predicts Cardiometabolic Conditions Over a 7-9 Year Follow-Up

Matt Lehrer, MS, Mary A. Steinhardt, EdD, Kinesiology and Health Education, The University of Texas at Austin, Austin, TX

Introduction: Stress-induced eating is associated with adverse short-term changes in cardiometabolic risk factors, but it is not known whether this coping behavior confers elevated disease risk over time. If it does, it is assumed to be due to promoting unhealthy dietary intake patterns, but this mechanism remains to be tested empirically. This study examined whether stress eating predicted the development of cardiovascular and metabolic conditions 7-9 years later, and whether consumption of certain types of food mediated that association.

Methods: Participants (N = 950) were from Wave 2 (2004-2009) and Wave 3 (2013-2015) of the Midlife in the United States study. Stress eating and dietary intake (fast food intake, fruit/vegetable intake, fatty meat intake) were self-reported via questionnaire at Wave 2. Presence of cardiometabolic conditions (heart disease, stroke, hypertension, type 2 diabetes, and central adiposity) were self-reported at Wave 2 and Wave 3 and summed. Path models estimated direct effects of stress eating on dietary intake variables and Wave 3 cardiometabolic conditions, and indirect effects from stress eating to Wave 3 cardiometabolic conditions through dietary intake variables. All paths were adjusted for age, sex, race, educational attainment, smoking history, alcohol intake, exercise frequency, sleep quality, and Wave 2 cardiometabolic conditions.
Results: Stress eating was positively associated with Wave 3 cardiometabolic conditions (β = .09, p = .001) and with fast food intake (β = .07, p = .04), but was not associated with fatty meat intake or fruit/vegetable intake. When included in the same model, stress eating (β = .09, p = .002) and fast food intake (β = .07, p = .02) both predicted Wave 3 cardiometabolic conditions, but fast food intake did not mediate the association of stress eating on Wave 3 cardiometabolic conditions (indirect effect: β = .002, p = .12).
Conclusions*:* Stress eating appears to be a tangible predictor of future cardiometabolic health, independent of traditional demographic and behavioral risk factors. Future research should include more comprehensive dietary assessments to determine whether stress eating increases cardiometabolic risk by promoting consumption of specific types of food.

Individual Abstract Number: 1403
High-fat diet in the context of aging robustly and negatively impacts amygdala microglial morphology and function causing long-term amygdala-dependent memory impairments.
Ruth M. Barrientos, PhD, Institute for Behavioral Medicine Research, The Ohio State University, Columbus, OH
We have previously shown that short-term consumption of a high-fat diet (HFD) is sufficient to induce neuroinflammation in the hippocampus and amygdala, causing long-term memory consolidation impairments in aged, but not young adult rats. To determine if microglia in these regions may be impacted above and beyond what is seen with aging alone, we examined microglial morphology in amygdala and hippocampus of young and aged rats fed HFD for three days. We also examined the functional status of microglia isolated from each region by measuring phagocytosis, *ex vivo*. In the hippocampus, aging-associated microglial priming was evident with increased microglial numbers and reduced branching. Furthermore, microglial phagocytosis was significantly increased. However, none of these effects were potentiated with HFD. The combination of age and HFD did reveal a significant increase of enlarged synaptophysin boutons in the CA1 and hilus regions of the hippocampus, indicative of neurodegeneration. In the amygdala, HFD exacerbated the effects of aging on microglial priming (morphology) and markedly suppressed phagocytosis without notably affecting synaptophysin. These data reveal that, like the hippocampus, the amygdala displays aging-associated microglial priming. Moreover, the aging amygdala appears to be uniquely vulnerable to the detrimental effects of HFD.

Individual Abstract Number: 1405
Baseline associations between biomarkers, neurocognitive function, and self-regulation indices in the Cognitive and Self-regulatory Mechanisms of Obesity Study (COSMOS)
Misty Hawkins, PhD, Psychology, Oklahoma State University, Stillwater, OK
Background: Excess adiposity causes metabolic changes that impair neurocognitive functions. These neurocognitive deficits may disrupt self-regulation efforts resulting in maladaptive dietary or exercise behaviors. Despite the growing emphasis on how obesity and its metabolic sequelae relate to neurocognitive function, no studies to date have examined all of the above factors concurrently. This project takes a first step in addressing these gaps by examining relationships between adiposity, metabolic impairment, executive function, and self-regulation indices among treatment-seeking adults.
Methods: 106 overweight/obese adults participating in the COSMOS behavioral weight loss trial (Identifier: NCT02786238) comprised the sample. Participants were 46±11 years old, 72% female, and 76% White. Adiposity was measured using waist circumference (WC), body mass index (BMI), and body fat percent (BF%). A latent Metabolic (Met) Impairment variable was modeled using fasting glucose, HbA1C, and the homeostatic model of insulin resistance (HOMA-IR). A latent Executive Function (EF) variable was modeled using the Stroop and Working Memory Task of the NIH Cognitive Toolbox. Self-regulation was measured with the Effortful Control Test. All variables were from baseline, and analyses used full information maximum likelihood analyses. A path model controlling for age and gender was constructed such that measured adiposity predicted latent metabolic factors which predicted EF which predicted self-regulation.
Results: Fit indices indicated marginal model fit (CFI=.887; TLI=.850; RMSEA=.074; SRMR=.092) with the following paths significant: Higher WC to higher Met Impairment (β=.37, p=.05), higher Met Impairment to lower EF (β=-.42, p=.01), and lower EF to lower Effortful Control (β=.32, p=.01). BMI and BF% were non-significant predictors in the model (*p*s>.25).
Conclusions: Greater abdominal obesity as measured by waist circumference predicted greater metabolic dysregulation, which in turn predicted poorer executive function and lower self-regulation among overweight/obese adults. Findings suggest that obesity is neurocognitively toxic via impairment in glucoregulatory function and insulin sensitivity which may impair functions essential to regulating dietary intake and physical activity. Future trial results will examine prospective associations between these variables.

Symposium 1411
Saturday, March 9 from 1:45 to 3:15 pm

Emotion regulation and variability in relation to daily stressors and health
Claudia Trudel-Fitzgerald, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Lewina O. Lee, PhD, Psychiatry, Boston University, Boston, MA, Lewina O. Lee, PhD, Psychiatry, Boston University School of Medicine, Boston, MA, Rebecca G. Reed, PhD, Psychology; Pathology and Laboratory Medicine, University of Kentucky, Lexington, KY, Nancy L. Sin, PhD, Psychology, University of British Columbia, Vancouver, BC, Canada, Claudia Trudel-Fitzgerald, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, Aric Prather, PhD, Psychiatry, University of California San Francisco, San Francisco, CA
Negative (e.g., anxiety, depression) and positive (e.g., affect, happiness) emotional factors have been associated with chronic disease onset and progression. While most research considered static emotional factors, such as their level at one point in time, more recent evidence suggests that *dynamics* in emotions and their *management*are key processes that may explain why emotional factors can "get under the skin" to affect health. Leveraging data from 3 epidemiological cohorts, this symposium presents longitudinal and prospective studies exploring the role of emotion variability and

regulation in the context of daily stressors and physical health outcomes.
The first talk will examine optimism, an emerging determinant of health maintenance, as an antecedent to more favorable patterns of affective reactivity to daily stressors. It draws on longitudinal data on optimism and a daily diary study conducted up to 2 decades apart in the Normative Aging Study.
The next two presentations will be based on data from the National Study of Daily Experiences, an 8-day daily dairy substudy embedded in the nationally-representative MIDUS cohort. The second talk will report on the association between negative emotion and cortisol dynamics, specifically by looking at their respective *intraindividualvariability* and *inertia* in 1,736 midlife adults; the role of daily stressor frequency and stress severity in relation to these constructs will be also discussed. The third talk will present novel data about the moderating role of sex in the association of daily emotional fluctuations following nights of inadequate sleep with functional decline across 10 years, in 853 midlife adults.
The last talk will build on prior epidemiological work suggesting a role of anger in all-cause mortality risk by verifying whether anger frequency and expression are related to various specific causes of mortality, including cancer, respiratory, and infectious diseases, in 16,729 men from the Health Professional Follow-Up Study.
This symposium extends emerging research on emotion variability and regulation by considering their influence on physical health. The discussant will integrate these findings and comment on how they contribute to ongoing scientific efforts that aim to optimally measure daily stressors and their emotional responses, particularly in relation to health maintenance and decline.

Individual Abstract Number: 1415

Optimism, Stress, and Affective Dynamics: Prospective Findings from the VA Normative Aging Study

Lewina O. Lee, PhD, Psychiatry, Boston University School of Medicine, Boston, MA, Avron Spiro III, PhD, Epidemiology and Psychiatry, Boston University Schools of Public Health and Medicine, Boston, MA, Daniel K. Mroczek, PhD, Medical Social Sciences and Psychology, Northwestern University Feinberg School of Medicine and Weinberg College of Arts & Sciences, Chicago, IL, Laura D. Kubzansky, PhD, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

INTRODUCTION: Growing evidence suggests optimism as a health asset: It has been associated with reduced risks of major diseases and premature mortality. Studies have demonstrated behavioral and cognitive pathways by which optimism promotes good health, but affective pathways are less well understood. This study evaluated whether optimism predicts affective dynamics in the context of daily stressors in a sample of aging men.
METHODS: The sample comprised 233 community-dwelling men in the Veterans Affairs Normative Aging Study who completed the Minnesota Multiphasic Personality Inventory-2 between 1986-1991 (M_{age}=59, SD=6). Between 2002-2010, the sample participated in up to 3 bursts of 8-day daily diary study. In each burst, they reported on daily stressors and end-of-day positive and negative affect (PA and NA) assessed with the PANAS (Watson et al., 1988). We computed 2 affective dynamics indices based on the PANAS: variability (indicated by burst-specific intraindividual standard deviation, iSD) and reactivity to daily stressors. Using multilevel regression with the affective dynamic indices as outcomes, we tested: (1) the main effects of optimism and daily stress exposure; and (2) whether optimism moderated the effects of stress exposure.
RESULTS: For iSD as outcome, more optimistic individuals exhibited greater PA and NA variability in measurement bursts which they endorsed more daily stressors (PA: B=0.24, SE=0.14; NA: B=0.20, SE=0.04). For reactivity as outcome, optimistic individuals did not respond to daily stressors with greater NA nor lower PA. However, lower levels of optimism (B=-0.30, SE=0.12), greater day-specific and burst-specific stress exposure were independently associated with higher levels of daily NA. Higher levels of optimism (B=2.29, SE=0.56), but not stress exposure, were associated with higher levels of daily PA. These findings generally held up after accounting for the effects of cohort, time, and chronic diseases at the time of optimism assessment.
CONCLUSION: Findings support the benefits of optimism on affective well-being among older men. Optimism appears to promote flexibility in affective responses to stressful circumstances. Independent of stress exposure, optimistic men had higher levels of affective well-being. Additional research is needed to evaluate the replicability of these findings in women and in younger adults.

Individual Abstract Number: 1417

Emotion and cortisol dynamics and daily stress in a national sample of adults

Rebecca G. Reed, PhD, Psychology; Pathology and Laboratory Medicine, University of Kentucky, Lexington, KY, Iris B. Mauss, PhD, Psychology, University of California, Berkeley, Berkeley, CA, Nilam Ram, PhD, Human Development and Family Studies, Pennsylvania State University, University Park, PA, Suzanne C. Segerstrom, PhD, MPH, Psychology, University of Kentucky, Lexington, KY

Background: Individuals' emotions and cortisol are dynamic. They fluctuate over time. These dynamics, above and beyond mean levels, may provide health-relevant information. Thus far, emotion and cortisol dynamics have been examined separately, despite affective and health theory suggesting an interplay of those systems. Moreover, daily stress processes may be important factors that give rise to more variable emotion and cortisol dynamics. The current study examined how, in a national sample of adults, individuals' day-to-day emotion dynamics related to differences in cortisol dynamics, and the role of daily stress in these dynamics.
Methods: Participants (N=1736, 33-84 years, 44% male) from MIDUS 2 reported stressor frequency and severity and negative emotions on 8 consecutive nightly telephone interviews and provided saliva samples on 4 interview days. Individuals' negative emotion (average of 14 items) and cortisol dynamics (after detrending) were quantified with respect to *intraindividual variability*, the extent to which a person's emotion or cortisol levels deviate from their homeostatic levels (calculated as the intraindividual standard deviation), and *inertia*, the degree to which a person's emotion or cortisol levels carry over from one moment to the next (calculated as the autocorrelation).
Results: In regression models that controlled for mean negative emotion, neither negative emotion variability nor inertia were associated with cortisol variability or inertia (*p*s > .30). Daily stressor frequency and severity were positively associated with negative emotion variability and inertia (*p*s =< .0001), but not with cortisol variability or inertia.
Conclusions: Daily stress processes were associated with more variable and inert negative emotions, which may indicate a potentially maladaptive pattern in which people with higher stressor frequency and severity experience large day-to-day fluctuations, but also show stronger self-predictive lingering effects that make emotions slower to recover back to homeostatic levels. Cortisol dynamics were unrelated to emotion dynamics or daily stressors. The two systems may respond in different ways to daily stressors. Further research with more than 4 days of cortisol is warranted to reliably examine dynamics in cortisol *slopes*. Our findings suggest it is fruitful to examine dynamics in addition to mean-level responses.

Individual Abstract Number: 1416

Emotional vulnerability to short sleep predicts 10-year change in functional status

Nancy L. Sin, PhD, Psychology, University of British Columbia, Vancouver, BC, Canada, David M. Almeida, PhD, Human Development and Family Studies, The Pennsylvania State University, University Park, PA

Background: Past research has demonstrated bidirectional links between sleep and emotions in daily life, with more robust findings for sleep as a predictor of next-day emotional well-being. People differ in their emotional vulnerability to inadequate sleep, such that some individuals may be more likely to exhibit increases in next-day negative emotions following short sleep. Individual differences in day-to-day sleep and emotion dynamics may have long-term implications for health and aging.

Objective: To evaluate daily emotional vulnerability to inadequate sleep as a predictor of changes in functional status across 10 years, as well as potential age and gender moderation.

Methods: A national sample of 853 adults (ages 25-75 at baseline) in the National Study of Daily Experiences reported sleep duration and negative affect (NA) during telephone interviews for 8 consecutive days. Basic activities of daily living (ADLs) and instrumental ADLs (IADLs) were assessed at baseline and 10 years later. Within-person slopes for the association between short sleep (defined as 6 or fewer hours) and next-day NA were outputted from multilevel models, then used to predict functional status.

Results: Short sleep duration predicted increased next-day NA; random effects indicated significant variability between individuals in this effect. People who experienced greater increases in NA following short sleep were more likely to report increased difficulty in performing ADLs at the 10-year follow-up (Est = 0.94, SE = 0.39, p = 0.015), controlling for baseline ADLs, age, gender, race, and education. This association was moderated by age and gender, such that emotional vulnerability to short sleep predicted ADL difficulty in middle-aged adults (40-59 years old) but not among younger (under 40) or older adults (60+), and in men but not women. Emotional vulnerability to short sleep did not predict IADL decline in the overall sample, although men with greater emotional vulnerability were marginally more likely to show 10-year increases in IADL difficulty (Est = 1.49, SE = 0.81, p = 0.07).

Conclusions: The within-person association between short sleep and next-day negative affect predicted declines in functional status across 10 years, particularly among men and midlife adults. These findings underscore the importance of daily sleep and emotion dynamics on long-term health outcomes.

Individual Abstract Number: 1414

Death of anger: Anger frequency and expression, and cause-specific mortality risk

Claudia Trudel-Fitzgerald, PhD, Ichiro Kawachi, MB.ChB., PhD, Laura D. Kubzansky, PhD, MPH, Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA

Objective: Anxiety and depression have been related to all-cause mortality, diseases risk, and related pathways like inflammation. While a substantial body of evidence has linked greater anger levels with elevated risk of cardiovascular diseases (CVD), less research has considered anger, notably its management, with risk of other causes of death. We examined if anger frequency and expression (e.g., slamming doors) were related to all-cause and cause-specific mortality over an 18-year follow-up period.

Methods: Men (N=16,729) from the Health Professional Follow-Up Study cohort who were free of chronic disease (e.g., cancer, CVD) when they reported levels of anger frequency/expression in 1996 were included in the analytic sample. Relevant risk factors including demographics, health status, and health behaviors were self-reported or extracted from medical records. Information about mortality was collected from state vital records and the National Death Index, and supplemented by reports from family members and postal authorities. Cause of death was evaluated by study physicians blind to study hypotheses. Cox proportional hazards regression models estimated hazard ratios (HR) and 95% confidence intervals (CI) of risk of mortality until 2014, adjusting for baseline potential confounders.

Results: There were 4,084 deaths over the follow-up period. Men reporting moderate or high (vs. low) levels of anger frequency and expression did not have, overall, a higher risk of death from all-cause or neurological, infectious, and respiratory diseases; however, those with greater levels of anger expression were more likely to die from cancer (e.g., HR_{high}=1.18, CI=1.01-1.38) but less likely to die from CVD (e.g., $HR_{moderate}$=0.86, CI=0.75-0.99). Findings were similar when adding a two-year lag between anger and mortality, and when considering anger frequency and expression in the models simultaneously.

Conclusions: In men, anger –particularly the outward expression of angry feelings– was related to risk of dying from cancer or CVD up to 18 years later; however, anger was unrelated to other causes of mortality. These results suggest that not only the experience of negative emotions, but also the way they are managed, may be critical for health. Our findings also underline the importance of considering causes of death separately when investigating psychosocial risk factors.

Symposium 1442
Friday, March 8 from 3:00 to 4:00 pm

Pain-related fear, avoidance, and decision-making: Novel insights from associative learning, computational modeling and brain imaging

Ann Meulders, PhD, Clinical Psychological Science, Maastricht University, MAastricht, , Netherlands, Jonas Zaman, PhD, Health Psychology, KU Leuven, Leuven, , Belgium, Lauren Y. Atlas, PhD, National Center for Complementary and Integrative Health; National Institutes on Drug Abuse, National Institutes of Health, Bethesda, MD, Laura Simons, PhD, Department of Anesthesiology, Perioperative, and Pain Medicine, Stanford University School of Medicine, Palo Alto, CA, Ann Meulders, PhD, Clinical Psychological Science, Maastricht University, Maastricht, , Netherlands

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 and bodily threat in order to avoid or minimize their impact. Protective responses (e.g. fear/avoidance) can be adaptive and promote recovery, yet they may paradoxically worsen the situation when pain no longer signals bodily threat i.e. chronic pain. Prominent clinical models of chronic pain indeed assign an important role to learning processes in the development and maintenance of pain-related disability. This symposium brings together emerging evidence on how classical and operant conditioning, instructions, and changes in sensory processing and/or biased decision-making may contribute to pain responses, pain persistence and pain-related disability. Four speakers from different labs will present innovative research on this topic. Using a computational modeling approach, the first speaker will argue and quantify that changes in pain reports may be driven by enhanced

sensory processing of noxious input, biased decision-making, or a combination of both. The second speaker will discuss how computational models can dissociate how instructions and associative learning shape pain, autonomic measures, and neural responses to noxious stimulation. The third speaker will take a developmental leap, presenting a novel fear conditioning and extinction paradigm comparing self-report, physiological, and brain imaging responses from youth with chronic pain and healthy peers. The last speaker will take it a step further from fear to avoidance, and will address the role of operant learning in the development of pain-related avoidance behavior and its spreading to similar movements and novel contexts. Clinical implications and novel targets for treatment will be discussed.

Individual Abstract Number: 1443

What drives your pain report? Decision parameters and their relation to self-reported pain.

Jonas Zaman, PhD, Health Psychology, KU Leuven, Leuven, Belgium, Katja Wiech, PhD, Centre for Functional Magnetic Resonance Imaging of the Brain, University of Oxford, Oxford, United Kingdom, Johan Vlaeyen, PhD, Health Psychology, KU Leuven, Leuven, Belgium

The bulk of (clinical) research on pain modulatory effects relies on changes in pain intensity ratings. Although these measures undoubtedly capture changes in pain perception they are merely descriptive and allow for only limited insights into the mechanisms driving the modulation. To overcome this issue, computational models have been developed that use behavioral responses to test specific hypotheses about underlying (cognitive) mechanisms. For methodological reasons, modelling approaches are primarily based on binary or multi-class categorizations (e.g., pain versus no pain). Whether and how distinct decision parameters map onto more commonly used pain intensity ratings is currently still unclear. For instance, it remains unclear whether increased pain reports stem from the enhanced sensory processing of noxious input, a bias to decide whether sensory input was painful or a combination of both. During this presentation, novel data is presented from a conditioning experiment where we assessed pain intensity ratings and estimated model parameters (using a hierarchical drift diffusion model based on a two-forced choice task: pain vs. no pain) to explore the relationship between both decision parameters and pain ratings. Our data provide evidence that pain ratings can be driven by distinct mechanism as they relate both to the speed at which (in)noxious input is processed as well as to the extent that a bias towards pain is embedded in the decision process. Taken together, the finding that different mechanisms can result in the same behavioral phenotype illustrate the added value of computational approaches as they go beyond the descriptive character of pain ratings.

Individual Abstract Number: 1444

How instructions, learning, and anxiety shape pain and pain-related responses

Lauren Y. Atlas, PhD, National Center for Complementary and Integrative Health; National Institutes on Drug Abuse, National Institutes of Health, Bethesda, MD

It is well known that pain is influenced by expectations, which may be learned through experience or conveyed via verbal instructions. We recently found that these processes are dissociable during classical fear conditioning. However, it is unknown whether these factors have dissociable influences on subjective outcomes such as pain, and how dynamic expectancy effects on pain are modulated by clinical factors such as anxiety. Recent work suggests that individuals with anxiety show impairments in adaptive learning during avoidance learning, but it is unknown whether such impairments influence Pavlovian learning or subjective outcomes. In this talk, I will present new unpublished work aimed at determining how instructions and feedback-driven learning shape reported pain, as well as autonomic and neural responses to noxious stimulation. 73 volunteers completed a pain reversal learning task in the clinic or in the fMRI scanner. Neutral auditory cues were paired with different levels of noxious heat, and contingencies reversed three times during the task. Predictive cue effects on pain updated as contingencies changed, whether individuals were instructed about reversals or learned purely through feedback. We fit computational models to pain reports to capture how pain varies through learning and instruction. Importantly, we found dissociations in the effects of anxiety on pain and autonomic responses: Individuals with high state anxiety reversed pain reports more quickly upon instruction, but maintained elevated arousal based on initial learning throughout the task. This suggests that different outcomes are sensitive to different types of learning, which has important implications for clinical treatment and patient outcomes.

Individual Abstract Number: 1445

Response to learned threat in youth with chronic pain

Laura Simons, PhD, Department of Anesthesiology, Perioperative, and Pain Medicine, Lauren C. Heathcote, PhilD, Inge Timmers, PhD, Anesthesiology, Stanford University School of Medicine, Palo Alto, CA, David Borsook, MD, PhD, Anesthesiology, Boston Children's Hospital & Harvard Medical School, Boston, MA

Normal activation of fear circuitry and interpretation of survival salient stimuli, including the automatic detection of threat, constitutes a fundamental protective mechanism in an organism. In chronic pain, the normal 'alarm system' is faulty, contributing to functional decline. Basic learning mechanisms of fear acquisition and extinction have not been previously examined in adolescents with chronic pain. Given current evidence among individuals with anxiety and adults with chronic pain, it is believed that poor threat-safety discrimination and decreased responsivity to extinction learning enhances vulnerability to pain persistence and heightens treatment resistance. In addition to providing an overview of this novel application of learning theory to pediatric pain, I will present new data on self-report, physiological, and brain imaging responses from youth with chronic pain and healthy peers to a novel fear conditioning and extinction paradigm.

Individual Abstract Number: 1446

Generalization of pain-related avoidance behavior to novel contexts and similar movements

Ann Meulders, PhD, Clinical Psychological Science, Maastricht University, Maastricht, Netherlands

Fear-avoidance models posit that pain-related fear and avoidance contribute to the transition from acute to chronic pain. When avoidance behavior serves to reduce/eliminate genuine bodily threat, it is adaptive. Yet, in the absence of actual danger, avoidance behavior may become maladaptive and lead to functional disability. Using a novel robotic arm-reaching task, in which participants freely moved their arm to reach a target location using the HapticMaster (i.e. 3-degree of freedom programmable robotic arm). Three trajectories (T1-3) led to the target location. During acquisition, participants performed arm-reaching movements in two contexts:a pain-avoidance context (e.g., black background) and a yoked context (e.g., white background). In the pain-avoidance context, a painful stimulus could be partly or completely prevented by performing the more effortful (in terms of distance and exerted force) trajectories T2 and T3; in the yoked context, the same number of pain stimuli was delivered irrespective of the chosen trajectories. In study 1, we tested the generalization of avoidance behavior to two novel generalization

contexts (e.g., tints of grey backgrounds). This study showed modulation of pain-related fear and pain expectancy by context. That is, the acquired differences between trajectories generalized to the novel context that resembled the pain-avoidance context but not to the one resembling the yoked context. In contrast, we only found partial evidence for avoidance behavior selectively generalizing to novel, but similar contexts. In study 2, we used a similar paradigm to study the spreading of pain-related avoidance to safe contexts in healthy participants with either high levels or low levels of trait anxiety and hypothesized that participants with high levels of trait anxiety would show less exploration in novel contexts and therefore would show more persistent avoidance behavior. Study 3investigated the spreading of avoidance behavior to novel but similar trajectories that were never paired with pain. Results showed that healthy participants generalized their pain-related fear and expectancy to these novel trajectories based on the similarity with the original trajectories. Their beliefs however were not reflected in their behavior. Acquired avoidance behavior did not generalize to the novel trajectories possibly due to exploration.

Symposium 1522
Saturday, March 9 from 12:15 to 1:30 pm

Biobehavioral and Neurobiological mechanisms of placebo effects
Andrea Evers, Dr., Faculty of Social Sciences, Health, Medical and Neuropsychology, Leiden University, Leiden, , Netherlands, Aleksandrina Skvortsova, MSc, Faculty of Social Sciences, Health, Medical and Neuropsychology, Leiden University, Leiden, , Netherlands, Stefanie H. Meeuwis, MSc, Faculty of Social Sciences, Health, Medical and Neuropsychology, Leiden University, Leiden, , Netherlands, Elizabeth A. Necka, Dr., National Center for Complementary and Integrative Health, National Institutes of Health, Bethesda, MD, Alessandro Piedimonte, Dr., Department of Neuroscience, University of Turin , Turin, , Italy, Madelon Peters, Dr., Section Experimental Health Psychology, Clinical Psychological Science, Departments, Faculty of Psychology and Neuroscience, Maastricht University, Maastricht, , Netherlands
Placebo effects have been repeatedly shown to relieve a variety of psychosomatic and physical symptoms. They have, for example, been demonstrated to reduce pain and itch in both experimental and clinical settings. While the occurrence of placebo effects has been well established in recent years, the underlying mechanisms remain rather underexplored. Current evidence suggests that placebo effects may be triggered through various pathways, for example, through conscious expectancy, associative learning mechanisms, or by presentation of social or verbal cues. However, it is not yet clear what biobehavioural and neurobiological mechanisms underly clinically significant placebo effects, whether efficacy differs across medical conditions, or what other factors may contribute to robust placebo effects.
In this symposium we will focus on the role of biobehavioural and neurobiological mechanisms that trigger placebo effects. We will present new evidence on the role of placebo effects in pain, endocrine responses, allergic reactions, Parkinson's disease and fatigue. Moreover, we will discuss various methods that can be applied to exploring the neurobiological underpinnings of placebo effects, such as evoked potentials (ERPs), fMRI analysis, hormonal responses, skin reactions and behavioral measurements. Understanding the underlying mechanisms of placebo effects is an important step towards applying these effects in clinical practice in order to improve health outcomes.

Individual Abstract Number: 1523
The role of placebo effect of oxytocin and exogenous oxytocin on the brain activity: an fMRI study.
Aleksandrina Skvortsova, MSc, Faculty of Social Sciences, Health, Medical and Neuropsychology, Leiden University, Leiden, Netherlands
Background: Classical conditioning is one of the mechanisms of placebo effect. Only few studies examined placebo effects in hormonal responses in humans, particularly not oxytocin responses, and no studies looked at the underlying brain mechanisms of endocrine conditioning.
Methods: We investigated conditioning of oxytocin in ninety-nine healthy females who were assigned to a conditioned, control or drug-control group. Participants in the conditioned and drug-control groups received an oxytocin nasal spray combined with a distinctive smell (conditioned stimulus, CS) during three acquisition days, while the control group received placebo nasal spray. Subsequently, the conditioned and control groups received placebo spray with the CS and the drug-control group- oxytocin spray during three evocation days. Salivary oxytocin levels were measured at baseline and at different points after the spray administration. On the third evocation day, an fMRI was done during three tasks, that had been previously shown to be affected by oxytocin administration: presentation of emotional faces, presentation of crying babies sounds and pain stimulation. We expected that exogenous and conditioned oxytocin would have a similar effect on brain activity and reduce amygdala activation in comparison to the control group.
Results: Physiologically, a significant increase of oxytocin salivary levels in the conditioned group on evocation day 1 was demonstrated. On evocation day 2, a trend for increased oxytocin levels was found and no conditioned response in saliva was found on evocation day 3. The fMRI findings demonstrate that exogenous oxytocin affected the brain activation in response to two of the three tasks (emotional faces and crying babies sounds), particularly reduced amygdala activation. However, conditioning with oxytocin did not have any differential effect on brain activity from the control group.
Conclusion: We demonstrated that it is possible to condition endogenous oxytocin release and that this conditioned response goes extinct during three evocation days. We were unable to find the effects of conditioned oxytocin responses on the brain activity but showed that exogenous oxytocin dampens amygdala activation. Future studies should examine the brain mechanisms underlying conditioned endocrine responses, measuring them during the peak of conditioned hormone release.

Individual Abstract Number: 1524
Placebo effects elicited by classical conditioning of antihistaminergic effects for itch
Stefanie H. Meeuwis, MSc, Faculty of Social Sciences, Health, Medical and Neuropsychology, Leiden University, Leiden, Netherlands
Background: Previous studies indicate that it may be possible to classically condition the effects of antihistamines to reduce symptoms of allergic rhinitis. These findings may extend to histamine-induced itch in skin conditions. Moreover, the effects of open-label conditioning (i.e. being told about the learning mechanisms involved) for itch are not yet clear. Demonstrating the efficacy of (open-label) conditioning may lead towards new treatment possibilities for allergies and skin conditions.
Methods: A two-phase randomized conditioning paradigm was used, that consisted of a learning phase, in which a neutral (to-be conditioned) stimulus (CS; distinctively beverage) was repeatedly combined with an unconditioned stimulus (the antihistamine levocetirizine) or placebo, and a testing phase, where the CS alone

was presented. Participants were assigned to 1) an open-label conditioned group, 2) a closed-label conditioned group, 3) a conditioned-not-evoked control group, or 4) a placebo control group. At baseline and on the final testing day, itch was induced through histamine iontophoresis.
Findings: Participants in the combined conditioned groups reported marginal lower itch than the combined control groups ($p = .07$), but no differences between separate groups were found (p-values $\geq .23$). Heart rate was reduced during the evocation sessions for the control groups, but not the conditioned groups ($p = .031$).
Discussion: Limited evidence is provided for the efficacy of conditioning of antihistamines for itch. There was no evidence that the open-label procedure resulted in less efficacious conditioning for itch in comparison to closed-label conditioning. More research is needed to examine under which circumstances placebo effects elicited by (open-label) conditioning may influence itch.

Individual Abstract Number: 1525
Cue and Treatment Expectations in Pain Modulation
Elizabeth A. Necka, Dr., Lauren Y. Atlas, PhD, National Center for Complementary and Integrative Health, National Institutes of Health, Bethesda, MD
Background The term 'placebo' is often used to a describe a wide variety of expectancy-based pain modulation effects. Cue-based expectancy effects focus on the *stimulus*, whereas treatment-based expectancy effects focus on an individual's *response* to a stimulus, which is modified by the treatment. We hypothesized these different types of expectations modulate pain independently and additively (as observed previously) and depend on dissociable neural mechanisms. Specifically, we expected that cue-based expectations about stimulus intensity would depend on processes involved in prediction error and aversive learning, whereas treatment-based expectations about responses to stimuli would depend on sustained processes involved in descending pain modulation.
Methods Forty participants completed a cue-based pain modulation paradigm in the scanner while receiving noxious thermal stimulation (individually calibrated to correspond to low, medium, and high intensity pain). Participants were instructed that auditory cues predicted low and high intensity pain. During conditioning, low and high intensity heat were preceded by low or high pain cues, respectively. Medium heat was then surreptitiously administered on 50% of remaining trials, preceded by low/high pain cues, to test cue-expectancy effects. Participants received heat to skin sites treated with a supposedly analgesic (placebo) cream, a cream with no purported effect on pain, and untreated sites to test treatment-expectancy effects.
Results Contrary to hypotheses, we observed a significant cue by treatment interaction. Treatment expectancy effects were stronger under expectations of high than low pain. In ongoing neuroimaging analyses we are testing the brain mediators of cue and treatment expectations on pain, and sustained background functional connectivity as a function of treatment expectations, in line with our pre-registered analytical plan.
Conclusions Our results demonstrate preliminary evidence that cue and treatment expectations may exert an interactive effect on pain. Neural data will demonstrate if processes supporting cue- and treatment-based expectancy effects are dissociable or partially overlapping. This work emphasizes the importance of considering the target of pain expectations (e.g. stimulus or response to treatment) for elucidating mechanisms of placebo analgesia.

Individual Abstract Number: 1526
Healthy, pathological and extreme physical performances: the role of placebo effects
Alessandro Piedimonte, Dr., Department of Neuroscience, University of Turin, Turin, Italy
Background: Placebos are good examples of how mental activity may affect different systems, such as pain perception and physical performance. Recently, different studies have investigated placebo effects on motor performance in healthy participants as well as in pathological conditions, such as Parkinson's Disease (PD). An important basic question of this emerging field is related to the biological and psychological mechanisms underlying placebo effects in motor performance. Indeed, techniques such as fMRI and electrophysiology have highlighted the central aspects of fatigue and how this process can be influenced by positive expectations. Furthermore, extensive studies on PD have discovered the importance of the dopaminergic system in relation to motor performance and its correlation to placebo effects. Recently, another piece of the puzzle has been added investigating physical performance in extreme conditions such as high altitude, to better understand the role of placebo effects on critical life functions such as oxygen inhalation.
Methods: All the studies that will be taken into account during the dissertation will involve different methods such as evoked potentials (ERPs), fMRI analysis as well as behavioral data collected from different tasks on motor performance such as fatigue tolerance and fatigue perception.
Results: In healthy participants it has been shown that fatigue can be reduced following positive expectations and this reduction can be measured by specific ERPs, hinting at the possible involvement of specific cortical areas, such as the supplementary motor cortex, in these processes. This result has been translated to clinical settings where it has been found that verbal communication about drug dosage changes motor performance and fatigue in PD patients, opening to possible clinical approaches aimed to reduce drug intake. Furthermore, results from studies in extreme conditions showed that placebo-O2 reduced general fatigue related to motor exercise as well as post-exercise headache opening new exciting possibilities for placebo research on physical performance in these environments.
Conclusions: The presented evidences not only highlight the different systems involved in placebo responses in motor performances but also raise the question of the limit beyond which these procedures can be called doping in all respects.

Symposium 1539
Thursday, March 7 from 2:30 to 3:45 pm

Psychosocial experiences and the regulation of the human genome
Kelly E. Rentscher, Ph.D., Psychiatry and Biobehavioral Sciences, Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, Los Angeles, CA, Allison K. Farrell, Ph.D., Psychology & Center for Molecular Medicine and Genetics, Wayne State University, Detroit, MI, Kelly E. Rentscher, Ph.D., Psychiatry and Biobehavioral Sciences, Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, Los Angeles, CA, Allison K. Farrell, Ph.D., Psychology & Center for Molecular Medicine and Genetics, Wayne State University, Detroit,

MI, Jessica Chiang, Ph.D., Psychology, Northwestern University, Evanston, IL, Katherine B. Ehrlich, Ph.D., Psychology, University of Georgia, Athens, GA, Judith E. Carroll, Ph.D., Psychiatry and Biobehavioral Sciences, Cousins Center for Psychoneuroimmunology, University of California, Los Angeles, CA
This symposium brings together innovative research from the emerging field of social genomics, the study of how social experiences regulate gene expression (Cole, 2009; 2014). Together, these presentations showcase research across laboratory and real-world settings using a diverse set of biological methods (DNA methylation, RNA transcriptional profiling, bioinformatics) to identify psychosocial risk (stress, depression, harsh parenting) and protective (self-disclosure, relational closeness) factors that can influence health via the regulation of the human genome. Importantly, the presentations in this symposium feature diverse samples of adolescents, couples, and families, with all samples predominantly or entirely comprised of African-American, Latinx, and/or Asian individuals. Furthermore, the symposium also contributes to presenter diversity, as it is comprised of women early career scientists from Asian American and European American backgrounds.Farrell will present data on how daily self-disclosure in adolescence is associated with gene expression related to a Type I interferon (IFN) response, a key regulator of immune function, via changes in cell subset composition. Chiang will present data that links depression with gene expression profiles associated with immune dysregulation during late adolescence. Ehrlich will present data on how the effects of cumulative risk on epigenetic aging in young adulthood are moderated by parenting quality, and the implications of this for metabolic disease. Rentscher will present data showing that relationship closeness among mid-life parents is a protective buffer of the effects of psychosocial stress on cellular stress and senescence, markers of biological aging associated with increased disease risk. Finally, Jude Carroll will provide commentary and discussion on these findings and future directions in this area of research. Together, these presentations and commentary highlight the impact of diverse psychological and social experiences in the regulation of the human genome and suggest several biological pathways through which psychosocial processes may contribute to individual health and disease.

Individual Abstract Number: 1540

Couples' relationship closeness buffers the effects of psychosocial stress on cellular stress and biological aging marker p16^{INK4a}

Kelly E. Rentscher, Ph.D., Judith E. Carroll, Ph.D., Psychiatry and Biobehavioral Sciences, Cousins Center for Psychoneuroimmunology, Rena L. Repetti, Ph.D., Psychology, Steve W. Cole, Ph.D., Medicine, Psychiatry and Biobehavioral Sciences, Cousins Center for Psychoneuroimmunology, Theodore F. Robles, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA

Background: Exposure to chronic stress is thought to accelerate cellular aging, offering one mechanism through which adversity may increase risk for age-related disease. Chronic activation of the sympathoadrenal system increases cellular energy production, resulting in cell stress. If unresolved, cell stress can initiate cellular senescence, a stable state of cell growth arrest. In previous work, we found that psychosocial stress was associated with increased expression of cellular senescence marker p16^{INK4a}; however, less is known about protective factors, such as social support, that may ameliorate the negative biological effects of adversity.
Methods: This study examined relationship closeness as a protective buffer against effects of stress on senescent signal p16^{INK4a} and transcription control pathways activated under cell stress: Nrf2 and heat shock factor (HSF). 73 parents (M_{age}=43; 55% female; 43% White/Non-Hispanic, 23% Latino, 21% African American, 11% Asian) of adolescent-aged children completed surveys of perceived stress (PSS) and closeness with their spouse (IOS). Blood samples were used for genome-wide mRNA profiling to assess p16^{INK4a} (*CDKN2A*) expression. Promoter-based bioinformatics analyses assessed activity of *a priori* selected transcription factors (Nrf2, HSF1, HSF2) in structuring empirical differences in stress-related gene expression for those with low vs. high closeness.
Results: A random effects model covarying for age revealed that closeness moderated the association between stress and p16^{INK4a}mRNA (*b*=-0.05, 95% *CI* [-0.10, -0.01], *p*=.03), such that greater stress was associated with increased p16^{INK4a} for those with low (*b*=0.10, *p*=.01) but not high (*b*=-0.003, *p*=.78) closeness. Bioinformatic analyses linked the interaction of stress and relational closeness to activity of Nrf2 (*Mean Log_2 Ratio [MLR]*=0.58, *SE*=0.15, *p*<.01), HSF1 (*MLR*=0.52, *SE*=0.15, *p*<.01), and HSF2 (*MLR*=0.41, *SE*=0.14, *p*=.02); relative to high-closeness individuals, low-closeness individuals showed greater stress-related elevations in activity for all 3 transcription factors.
Conclusions: Findings extend previous work by identifying relationship closeness as a protective factor that may buffer the negative impact of psychosocial stress on aging pathways, implicating cell stress and senescence as mechanisms through which adversity may increase age-related disease risk.

Individual Abstract Number: 1541

Transcriptomic and Cell-Type Compositional Effects of Self-Disclosure

Allison K. Farrell, Ph.D., Psychology & Center for Molecular Medicine and Genetics, Justyna Resztak, BS, Henriette Mair-Meijers, BS, Adnan Alazizi, BS, Center for Molecular Medicine and Genetics, Samuele Zilioli, PhD, Psychology and Family Medicine, Roger Pique-Regi, PhD, Francesca Luca, PhD, Center for Molecular Medicine and Genetics & Obstetrics and Gynecology, Richard B. Slatcher, PhD, Psychology, Wayne State University, Detroit, MI

Background: Self-disclosure has long been recognized as a key interpersonal behavior linked to improved physical health. However, the biological underpinnings of these effects are not well understood. In this study, we examine the gene expression signature of self-disclosure to test whether changes in gene expression explain links between self-disclosure and health.
Methods: 120 youth (age 10-17) from the metropolitan Detroit area were recruited for this study. Participants were predominantly Black (79%) and lower SES. Youth reported on the extent to which they self-disclosed their thoughts and feelings to another person in daily diaries for 4 days. Afterwards, 22 cc of whole blood was collected from each participant. Leukocytes were trapped from whole blood and their RNA was isolated using the Leukolock system, and RNA was sequenced using next generation sequencing.
Results: Differential gene expression analyses (10% false discovery rate) showed that 3374 genes significantly varied in expression levels based on average self-disclosure from across the four days (controlling for age, sex, ancestry, and technical variables). Pathway analysis showed that these DE genes were enriched for Type I interferon response (which elicits anti-viral response) based on Gene Ontology (4.42-enrichment, Benjamini-Hochberg q-value=3.99e-8) and Reactome pathway analysis (IFNg 4.22-enrichent, q-value=1.54e-8; IFNa+b 4.96-enrichment, q-value=3.32e-8). However, when differential gene expression analyses were run controlling for cell type composition within the leukocytes, no genes were differentially expressed based on self-disclosure. Specifically, increased neutrophil (*r*= .37, p<.001) and reduced lymphocyte (*r*= -.37, p<.001) and basophil (*r*= -.21, p=.04) levels were associated with self-disclosure.
Conclusions: These findings suggest that regularly self-disclosing is associated with better anti-viral response, but this effect is driven

primarily by the cellular makeup of blood rather than by gene expression specifically.

Individual Abstract Number: 1542
Depressive symptoms and transcriptional indicators of immune alterations during late adolescence
Jessica Chiang, Ph.D., Psychology, Northwestern University, Evanston, IL, Steve Cole, PhD, Medicine; Psychiatry and Biobehavioral Sciences, Julie Bower, PhD, Psychology; Psychiatry and Biobehavioral Sciences, Michael Irwin, Professor, Medicine; Psychiatry and Biobehavioral Sciences, Shelley Taylor, PhD, Psychology, Andrew Fuligni, PhD, Psychology; Psychiatry and Biobehavioral Sciences, UCLA, Los Angeles, CA
Background: Depression is a leading contributor to total global disease burden and increases risk for a number of chronic conditions associated with aging including cardiovascular disease. Prior research points to immune dysregulation is one pathway underlying this association, but depression-immune links have primarily been examined among adults. Little is understood about how depression may contribute to immune dysregulation among adolescents despite the fact that rates of depression rise and peak during the adolescent years. Therefore, the purpose of the present investigation was to examine how depressive symptoms may be associated with transcriptional indications of immune dysregulation during late adolescence.
Method: Participants were 57 (64%) Latino adolescents and 32 (37%) European-American adolescents (total N = 89). Using the CES-D, they indicated the extent to which they experienced depressive symptoms during the past week and categorized into having high levels of depressive symptoms that were likely clinically significant (CES-D ? 16) and having low levels of depressive symptoms (CES-D < 16). Participants also provided blood samples from which peripheral blood mononuclear cells were isolated. RNA were then extracted and genome-wide transcriptional profiling and bioinformatics analyses were conducted.
Results: Results indicated that adolescents with high levels of depressive symptoms tended to have increased expression of genes bearing response elements for NF-?B (mean log2-trasnformed TFBM ratio in up- vs down-regulated genes = 1.822 ± standard error .529, p = .001), a key transcription factor that increases production of pro-inflammatory cytokines when activated. They also had reduced expression of genes bearing response elements for the glucocorticoid receptor (-.905 ± .395, p = .023), which is crucial to inhibiting and terminating the inflammatory response, and of genes bearing response elements for interferon response factors (-1.541 ± .575, p = .008), which are implicated in antiviral activity.
Conclusions: This pattern of findings supports the notion that immune dysregulation is a pathway linking depression to disease risk and suggests that immune dysregulation associated with depression may be detected by late adolescence.

Individual Abstract Number: 1582
Risk Exposure and Harsh Parenting in Adolescence Predict Epigenetic Aging in Young Adulthood
Katherine B. Ehrlich, Ph.D., Psychology, Tianyi Yu, Ph.D., Center for Family Research, University of Georgia, Athens, GA, Edith Chen, PhD, Gregory E. Miller, Ph.D., Psychology, Northwestern University, Evanston, IL, Gene H. Brody, Ph.D., Center for Family Research, University of Georgia, Athens, GA
Background: A growing body of research suggests that exposure to harsh parenting, inadequate resources, and parental depression in childhood and adolescence are risk factors for vulnerability to chronic diseases of aging in adulthood (Shonkoff et al., 2009). Recent efforts have begun to shed light on mechanisms that may explain, in part, how these stressful experiences forecast health problems. In the present study, we used a marker of epigenetic aging derived from the DNA methylation pattern of immune cells. Hannum et al. (2013) identified methylation patterns in tissues that can be used to reflect the disparity between an individual's biological and chronological age. We hypothesized that youth who were exposed to elevated family risk and who received harsh parenting would exhibit the most accelerated aging over a 4-year period, relative to youth who were exposed to less family risk.
Methods: Data for this study were drawn from the Strong African American Healthy Adults Project (SHAPE; Brody et al., 2013). Adolescents reported on their receipt of harsh/inconsistent parenting (e.g., slapping, hitting, shouting to discipline) at ages 16 and 17. We created a cumulative risk index (assessed at ages 16-18) that included family poverty status, parental depression, parent unemployment, inadequate income, neighborhood poverty, and racial discrimination. At age 20, youth provided blood samples for analysis of DNA methylation; epigenetic aging was calculated based on the Hannum epigenetic clock (Hannum et al., 2013).
Results: High levels of cumulative risk were associated with higher epigenetic aging during young adulthood when youth experienced high levels of harsh parenting (simple-slope = 1.353, 95% CI [0.614, 2.092], $p < .001$). Conversely, for youth who received low levels of harsh parenting, cumulative risk was not associated with epigenetic aging (simple-slope = 0.184, 95% CI [-0.544, 0.911], $p = .620$). Again, this epigenetic aging score reflects PBMC that are epigenetically older than would be expected based on chronological age.
Conclusions: Exposure to family adversity in adolescence is associated with epigenetic aging in young adulthood and is further exacerbated by harsh parenting. Implications for future physical health problems (e.g., metabolic syndrome) will be discussed.

Symposium 1614
Thursday, March 7 from 2:30 to 3:45 pm

Prediction and prevention of emotional and physical problems in breast cancer survivors
Madelon L. Peters, PhD, Clinical Psychological Science, Maastricht University, Maastricht, , Netherlands, Ilse Mesters, PhD, department of epidemiology, Maastricht University, Maastricht, , Netherlands, Madelon L. Peters, PhD, Clinical Psychological Science, Maastricht University, Maastricht, , Netherlands, Katherine Hadlandsmyth, PhD, Anesthesia, University of Iowa, Iowa City, IA, Julie Bruce, PhD, Warwick Clinical Trials Unit, University of Warwick , Coventry, United Kingdom
Currently, one in nine women will be affected by breast cancer at some point in their life, and this number is expected to increase due to the aging population. Despite improved prognosis, breast cancer survivorship comes with considerable physical and psychological problems. Recent meta-analyses reported that a staggering 45% of women have longstanding pain after breast cancer treatment, and almost one-third report (severe) fatigue. Moreover, both pain and fatigue can lead to functional impairments and affect normal daily functioning. Emotional problems are common in the aftermath of cancer treatment, especially symptoms of anxiety and depression. These emotional problems may further aggravate pain and fatigue and hamper adequate functioning. Breaking this negative cycle by early intervention may be of utmost importance.The four presenters in this symposium will (1) address risk and resilience factors predicting emotional and physical functioning in breast cancer survivors; and (2) present data on the effectiveness of early intervention to prevent emotional and physical problems after breast cancer treatment. The first speaker will specifically focus on Illness

perception of residual symptoms after treatments and how these are related to fatigue and (intentions of) positive health behavior. The next speaker will present data from a large prospective study on risk and resilience factors for emotional recovery 6 and 18 months after breast cancer surgery (speaker 2). The focus will be on the role of fear of cancer recurrence and trait resilience. The two final speakers will present data on the effectiveness of respectively a one-session postsurgical "acceptance and commitment therapy" intervention (speaker 3) and a rehabilitation intervention with a behavioral component (speaker 4) to decrease pain, disability and emotional problems after breast surgery. Prediction and prevention studies are not only clinically relevant, they will also further substantiate the intricate association between psychological and physical health.

Individual Abstract Number: 1699

Illness Perception of Cancer-related Residual Symptoms, Fatigue and Intentions towards a Healthy Lifestyle in Post-treatment Cancer Survivors

Ilse Mesters, PhD, department of epidemiology, Maastricht University, Maastricht, Netherlands

background

Fatigue is a highly prevalent complaint in cancer survivors. Fatigue affects many aspects of healthy functioning, and may lead to poor treatment adherence and lack of motivation to adopt healthy lifestyle changes. This study explored the association between illness perception of cancer-related residual symptoms, fatigue and intentions to adopt a healthy lifestyle. In response to residual symptoms, cancer survivors form cognitive and emotional representations of their illness. Previous studies found negative illness perceptions of cancer-related residual symptoms to be associated with worse quality of life and depression.

Method

The study population consisted of 255 early cancer survivors. Illness perception of cancer-related residual symptoms was measured with the Brief Illness Perception Questionnaire, which measures 8 dimensions of emotional and cognitive illness representations. Fatigue was measures using the European Organization for Research and Treatment of Cancer Quality of life assessment (EORTC QLQ-C 30), and intention to adopt a healthy lifestyle with single items for 4 different health behaviors (physical activity, diet, alcohol abstinence and smoking cessation). The association of illness perception with respectively fatigue and intention to adopt a healthy lifestyle was examined. Demographic factors (age, gender), cancer-related factors (type of cancer, type of treatment and psychological factors (anxiety, depression) were examined as possible moderators.

Results

Results from multiple linear regression analyses showed that more negative illness perceptions were associated with higher levels of fatigue. The relationship between illness perceptions and intention to adopt a healthy lifestyle was moderated by gender. In women, negative illness perceptions were associated with more reluctance to adopt a healthy lifestyle.

Conclusion

This study showed that fatigue and intention to adopt a healthy lifestyle are related to illness perception of cancer-related residual symptoms in cancer survivors. Since fatigue is a major problem in breast cancer survivors and because the association between negative illness perceptions and reluctance to change health behavior in a positive direction was specific for women, especially breast cancer survivors could benefit from interventions to promote more optimistic illness perceptions.

Individual Abstract Number: 1695

Fear of cancer recurrence, optimism and trait resilience predict emotional and physical functioning in breast cancer survivors

Madelon L. Peters, PhD, Sabine Markovitz, Msc, Clinical Psychological Science, Maastricht University, Maastricht, Netherlands

Background

Many breast cancer survivors experience emotional problems in the aftermath of treatment. Moreover, persistent pain and functional limitations are prevalent. One factor that seems highly predictive of both physical and emotional recovery after breast cancer treatment is fear of cancer recurrence (FCR). On the other hand, trait resilience and optimism may be protective of persistent emotional and physical problems. We performed two studies to assess cross-sectional and prospective associations between FCR, resilience, emotional distress, and pain.

Methods

Study 1: a cross-sectional study in 136 breast cancer survivors. FCR was measured with the Concerns About Recurrence Scale (CARS), functioning and wellbeing with the SF36 and pain with a single item. Associations between the variables were established.

Study 2: a prospective study in 253 breast cancer patients and 211 healthy women. FCR (CARS), resilience (CD-risk), optimism (LOT-R), neuroticism (EPQ), anxiety and depression (HADS), positive and negative affect (PANAS) and happiness were assessed shortly after surgery and 6 and 18 months later. Mixed model regression was used to assess changes in predictor and outcome variables across time and to identify predictors of the level and change in distress and wellbeing.

Results

Study 1 showed a prevalence of moderate to high FCR of 66%. FCR was higher in younger women and in women reporting pain. High levels of FCR were associated with lower levels of functioning and wellbeing. The results of study 2 showed that FCR did not decrease across the 18 month assessment period, and even increased in younger women. Optimism was related to lower FCR at all three timepoints. Compared to healthy women, cancer survivors had elevated levels of anxiety and depression and reported lower levels of positive emotions and happiness. Moreover, their emotional condition deteriorated further across the 18 months. Levels of distress and wellbeing, but not their change over time, were predicted by neuroticism, resilience and optimism.

Conclusion

Screening for high FCR and neuroticism and low resilience and optimism may identify patients prone to develop persisting physical and emotional problems. Interventions may specifically target these at risk patients.

Individual Abstract Number: 1634

A Single Session Psychological Intervention for Women Undergoing Surgery for Breast Cancer: A Pilot

Katherine Hadlandsmyth, PhD, Anesthesia, University of Iowa, Iowa City, IA, Lilian Dindo, PhD, Psychiatry, Baylor College of Medicine, Houston, TX, Sonia Sugg, MD, Surgery, M. Bridget Zimmerman, PhD, Biostatistics, Barbara Rakel, PhD, Nursing, University of Iowa, Iowa City, IA

Background: Depressive and anxious symptoms are common among patients with breast cancer and about 30% of patients experience persistent pain following breast cancer surgery. The current pilot study aimed to investigate whether a single session psychological intervention could mitigate the potential negative impact of breast cancer surgery.

Methods: This study is a pilot randomized control trial of a single session of Acceptance and Commitment Therapy (ACT) at two

weeks post-surgery compared to Treatment as Usual (TAU). Participants were screened preoperatively and determined to be at risk for persistent post-surgical pain based on elevated depressive symptoms (PHQ-8 ≥ 10); anxious symptoms (GAD-7 ≥ 10); pain catastrophizing (PCS ≥ 30); pre-existing chronic pain conditions; or young age (< 50 years).
Results: Of the 264 women scheduled for first time breast surgery to treat cancer or ductal carcinoma in situ, 115 expressed interest and 64 met screening criteria. A total of 62 were consented and randomized. Following randomization, 3 participants were excluded (due to delayed surgery or post-operative complications) and 3 withdrew, resulting in a final *N* = 56 (ACT = 26; TAU = 30).
Logistic regression analyses did not identify significant differences between the groups in moderate to severe pain in the breast or arm at 3-months post-surgery (odds ratio = 1.18; 95% CI: 0.24 – 5.83; *p* = .84). Differences between the two groups were also not detected on measure of anxiety (odds ratio = 1.85; 95% CI: 0.31 – 11.01; *p* = 0.50) or depression (odds ratio = 1.63; 95% CI: 0.39 – 6.85; *p* = .51) at three months pos-surgery. Pain interference was also not significantly different between groups (Mann-Whitney U test *p* = .42) at three months.
Conclusions: We did not find a significant impact on pain severity, pain interference, depression, or anxiety for the single session ACT intervention. There appeared to be floor effects in terms of low levels of pain, depression, and anxiety across the sample at 3-months post-surgery. This indicates the potential need for better identifiers of risk in this population.

Individual Abstract Number: 1616
Postoperative pain after breast cancer surgery: the UK Prevention of Shoulder Problems Trial (UK PROSPER)
Julie Bruce, PhD, Warwick Clinical Trials Unit, University of Warwick, Coventry, United Kingdom, Bruno Mazuquin, PhD, Warwick Clinical Trials Unit, University of Warwick, Warwick Medical School, Coventry, United Kingdom, Esther Williamson, PhD, The Centre for Rehabilitation Research, University of Oxford, Oxford, United Kingdom, Pankaj Mistry, MSc, Warwick Clinical Trials Unit, University of Warwick, Warwick Medical School, Coventry, United Kingdom
Background
Shoulder dysfunction and pain following breast cancer treatment impacts upon postoperative quality of life. Early postoperative exercise may improve shoulder function and reduce postoperative complications. There is uncertainty around the optimal timing and exercise dosage required for promotion of postoperative recovery.
Methods
UK PROSPER is a pragmatic multicentre RCT that aimed to evaluate the clinical and cost-effectiveness of an early supervised structured exercise programme, with behavioral support, compared to usual care, for women after breast cancer surgery. Aim was to recruit 350 women; postoperative follow-up was undertaken at 6 weeks, 6 and 12 months post-randomisation. Participants received the PROSPER exercise intervention or best practice usual care. The primary outcome was upper arm function assessed using the Disabilities of the Arm Shoulder and Hand (DASH) questionnaire. Secondary outcomes include DASH subscales, acute and chronic pain, complications, health related quality of life (QoL), and resource use. Pain intensity and neuropathic pain was captured using VAS (0-10) and Doleur Neuropathique (DN4) scale. QoL was measured using the SF12 and EQ-5D-5L. Confidence in ability to return to usual activities and regular physical activity using VAS (0-10).
The PROSPER intervention incorporates three exercise components and behavioural strategies to encourage adherence and support exercise behaviour.
Results
A total of 392 women were randomised (196 per arm). Mean pain intensity scores before breast surgery were low (mean 1.9 VAS, SD 2.5), with 79 (22%) women reporting preoperative numbness and 34 (10%) with a positive DN4 indicative of neuropathic pain. Baseline confidence in ability to return to regular physical activity was good (mean 7.8; SD 2.4, n=354). At six weeks after surgery, over half reported persistent postoperative numbness at or near the operative site and 19% had neuropathic pain characteristics. Mean (SD) SF-12 physical and mental health scores improved over 12 months to (PF 4.8 SD 1.3 baseline; 4.7 (1.3) 12 months; MH 6.4 (SD1.1) baseline; 6.5 (1.0) 12 months). Data by treatment arm will be presented.
Conclusion The findings from the PROSPER trial will inform future clinical practice and provide valuable insight into the recovery trajectory and role of physiotherapy-supported exercise in breast cancer rehabilitation.

Symposium 1727
Saturday, March 9 from 3:30 to 4:30 pm

Depression Risk and Prevention in Breast Cancer Patients
Karen L. Weihs, M.D., Psychiatry, University of Arizona, Tucson, AZ, Annette L. Stanton, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Jacqueline H. Kim, Ph.D., Psychology, University of California, Los Angeles, Los Angeles, CA, Joshua Wiley, PhD, Psychological & Brain Sciences, Monash University, Melbourne, , Australia, Mairead H. McConnell, M.A., Psychology, University of Arizona, Tucson, AZ, Janine Giese-Davis, PhD, Psychosocial Oncology; Psychology, University of Calgary , Calgary, AB, Canada
Women with breast cancer are at an increased risk of developing depression in the year after their cancer diagnosis compared to their healthy counterparts. Not only is depression a difficult experience in itself, but breast cancer survivors with depression are at greater risk of developing comorbidities, incur higher medical care costs and have shorter survival after diagnosis, relative to non-depressed survivors. While depression can be treated effectively in cancer patients, another important and promising avenue is *prevention.* Prevention requires identifying predictors of depression after a cancer diagnosis and offering evidence-based interventions that target those factors in individuals who are at risk.
The proposed symposium includes two presentations involving data collected in the My Year After Cancer (MYA) study, an investigation of 460 women followed for 12 months after their breast cancer diagnosis, and one presentation involving data from a pilot study of an intervention developed to prevent depression in the year after a breast cancer diagnosis.
Dr. Kim will present findings from a latent profile transition analysis of coping processes employed by women in the MYA study, identifying distinct coping profiles and exploring how these coping strategies relate to depressive symptoms and changes in symptoms. Building on that presentation, Dr. Wiley will describe how heart rate variability, an indicator of emotion-regulatory competence and a correlate of depression, interacts with chronic stress in predicting trajectories of depressive symptoms in the MYA sample.
Finally, Mairead McConnell will present results of a pilot study of the Enhancing Modulation of Emotions and Resilience Generating Experiences (EMERGE) Intervention. This intervention was designed to target coping strategies and risk factors identified in the MYA study and has been piloted in a cohort of 15 women with breast cancer. This presentation will discuss the intervention and study design, and results of the pilot trial, including measures such as coping styles and depressive symptoms.

Individual Abstract Number: 1731

Coping Profile Transitions and Depressive Symptoms in the Year Following Breast Cancer Diagnosis

Jacqueline H. Kim, Ph.D., Emma E. Bright, M.A., Timothy J. Williamson, M.A., Jennifer Krull, PhD, Annette L. Stanton, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Karen L. Weihs, M.D., Psychiatry, University of Arizona, Tucson, AZ

Background: How people cope with cancer influences health-related outcomes, including depression, and the distinct contributions of specific coping strategies are known. Yet, few have examined which constellations (profiles) of coping strategies are employed by adults with cancer and it is unknown whether: (a) coping profiles change, and (b) change in coping profiles relates to symptom change. This study identified coping profiles in women recently diagnosed with invasive breast cancer and examined whether coping profile transitions differentially predicted depressive symptoms over one year.

Methods: Latent profile transition analysis was conducted with repeated measures of cancer-related coping processes (study entry, 3 months, 6 months, 9 months) from 457 women. Coping transition groups were entered as predictors of depressive symptoms in multilevel modeling.

Results: Three profiles of coping (Primarily Acceptance, Moderate Approach-oriented, High Approach-oriented) emerged at study entry, followed by two profiles (Moderate-High Approach, Primarily Acceptance) at 3 and 6 months, and two profiles (High Acceptance, Low Approach) at 9 months. Most women (48%) maintained their high use of multifaceted, approach-oriented coping over time (Consistently High Maintainers). Transitions between coping profiles occurred commonly at study entry to 3 months and at 6 months to 9 months, with women altering coping profiles generally increasing their use of approach-oriented coping strategies. Women who increased approach-oriented coping to high levels at 3 months then maintained this gain (Early Increase Maintainers) and women who mainly focused on acceptance until 9 months, had significantly higher depressive symptoms at study entry compared to Consistently High Maintainers. Although depressive symptoms declined on average, Early Increase Maintainers had a steeper decline than Consistently High Maintainers. There were no differences in depressive symptoms between any coping transition groups at 9 months.

Conclusions: During the first year following breast cancer diagnosis, distinct coping profiles are evident. Coping profiles are most stable for women who use high multifaceted approach-oriented coping from the outset. An early increase in and maintenance of multiple approach-oriented coping strategies is associated with the greatest decline in depressive symptoms.

Individual Abstract Number: 1732

Heart Rate Variability Interacts with Contextual Life Stress to Predict Depressive Symptoms: A Prospective Cohort Study in Women with Breast Cancer

Joshua Wiley, PhD, Psychological & Brain Sciences, Monash University, Melbourne, Australia, John B. Allen, PhD, Psychology, University of Arizona, Tucson, AZ, Annette L. Stanton, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA, Karen L. Weihs, M.D., Psychiatry, University of Arizona, Tucson, AZ

Background: Women with breast cancer not only experience cancer-related stress but also contextual life stress (e.g., interpersonal, financial strain). Cardiac vagal control, indexed by respiratory sinus arrhythmia (RSA), is considered a physiological marker of affect regulation. In the year after breast cancer diagnosis, this study aimed to: (1) test whether RSA predicts depressive symptom trajectories, (2) compare the magnitude of effects of RSA and stress on depressive symptoms, and (3) test whether RSA moderates the association of stress and depressive symptoms.

Methods: Women recently diagnosed with breast cancer (N=460) were enrolled in the study. A subset free of treatments or conditions impacting RSA assessment (N=171) completed a 5-minute electrocardiogram at study entry. Depressive symptoms were assessed at study entry, 6, 12, 18, 24, 36, and 52 weeks using the Center for Epidemiologic Studies Depression (CES-D) scale. Contextual stress was measured at study entry using the Life Stress Interview and was characterized as: chronic interpersonal, chronic noninterpersonal, pre- and post-diagnosis acute stress. Multilevel structural equation models were used to predict CES-D trajectories from RSA, stress, and the stress x RSA interactions and effect sizes were Cohen's f^2 based on fixed effects.

Results: In unadjusted models, high chronic noninterpersonal (f^2=.17, p<.001) and interpersonal (f^2 =.16, p<.001) stress, low RSA (f^2 =.04, p<.001), and high post-diagnosis acute stress severity (f^2=.03, p=.03) predicted higher depressive symptoms across the 12 months. Pre-diagnosis acute stress (number and severity) and post-diagnosis number of acute stressors did not predict depressive symptoms (all p>.05 all f^2≤.02). Adjusting for covariates, no acute stress measure remained significant, but results for chronic stress and RSA were unchanged.

Stress x RSA interactions emerged for chronic noninterpersonal and interpersonal stress and acute pre-diagnosis stressors (all p<.05). Women with low RSA and high stress had the highest levels of depressive symptoms early, but also had a faster decline over time.

Conclusions: Assessing RSA can help identify women at greatest risk for elevated depressive symptoms and is a stronger predictor than acute stress. Beyond its well-established main effects on depressive symptoms, RSA also interacts with contextual life stress.

Individual Abstract Number: 1733

An Intervention Targeting Cancer-Related Coping and Emotion Regulationin Breast Cancer Patients at Risk for Depression

Mairead H. McConnell, M.A., Psychology, Karen L. Weihs, M.D., Psychiatry, University of Arizona, Tucson, AZ, Joshua F. Wiley, PhD, Psychological Science, Monash University, Melbourne, Australia, Catherine M. Crespi, PhD, Biostatistics, University of California, Los Angeles, Los Angeles, CA, Shannon Sauer-Zavala, PhD, Psychological & Brain Sciences, Boston University, Boston, MA, Annette L. Stanton, PhD, Psychology, University of California, Los Angeles, Los Angeles, CA

Objective: This pilot study of a preventive intervention for breast cancer patients at risk for depression targeted cancer-related coping and emotion regulation.

Methods: Patients' preferences for individual, in-person, and time-efficient intervention informed this adaptation of Barlow's Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP). Patients who scored ≥6/23 on the DRQ-7 depression risk screener received a six-week, six-hour intervention including two telephone sessions and two in-person sessions, with daily exercises.

Cancer-related coping, emotion regulation strategies, and depressive symptoms were assessed at baseline, before each session, and four weeks after the intervention. Mixed effects repeated measures ANOVA tested intervention by time effects, controlling for age, partnered status and disease stage.

Results: Fifty-five percent (40/72) of women screened within 6 months of breast cancer diagnosis had elevated depression risk; 5 were ineligible due to major depression or death. Of the 35 eligible women, 17 (49%) enrolled in the study. Ninety-eight percent attendance and 70% at-home practice days indicated feasibility. A significant effect of time/intervention indicated significant increases in cancer-related coping through acceptance and expression and decreases in avoidant coping, as well as enhanced emotion regulation

via cognitive skills and decreases in rumination, experiential avoidance and fear of becoming depressed. Non-significant changes in mindfulness as well as in depressive symptoms were observed in the expected directions.
Conclusions: The feasibility of this intervention and the malleability of its targets support further investigation for reducing depression risk after breast cancer.

Symposium 1757
Thursday, March 7 from 9:30 to 10:45 am

Grief trajectories and individual differences: From mind to body and back?
Christopher P. Fagundes, Ph.D., Angie LeRoy, Ph.D., Levi Saucedo, B.A., Lydia Wu, B.A., Psychology, Rice University, Houston , TX
One-third of the population age sixty-five and older is considered a widowed person. Compared with non-bereaved adults, older spousally bereaved adults have a greater occurrence of somatic symptom, illness, heart attack and stroke, medical service usage, new illnesses, worsened illnesses, poorer health ratings, depression, and mortality. Excess mortality among those who are widowed is highest immediately after the loss, but bereaved individuals remain at heightened risk well after their first year of being widowed. Bereavement is characterized by considerable mind-body (and some of our presenter's data suggest Body to Mind) dysregulation such that those who have been widowed have greater autonomic, neuroendocrine, and immune dysregulation compared with age matched controls. Yet there has been almost no work examining who, among bereaved individuals, is most at risk for physiological dysregulation. Furthermore, we know nothing about trajectories of dysregulation (both autonomic and immune) after the loss. Our diverse group of speakers (two males and 2 females, two out of the four identify as a racial/ethnic minority) will present data on different aspects of the body-mind connection as it relates to grief. Our first speaker will present work charting the trajectories of change in mental health outcomes, as well as surrogate markers of physical health outcomes (inflammation & heart rate variability) in the first year after the loss of a spouse. The second speaker will utilize aspects of signal transduction theory of depression to examine if widows/widowers initial levels of inflammation predict future levels of depression and grief (a body to mind hypothesis). The third speaker will present data showing that neighborhood context may impact heart rate variability (HRV) and latent herpesvirus reactivation in the first year after the loss of a spouse. The last presenter will examine if attachment theory, a well- established predictor of mental health outcomes after a loss, contributes to our understanding of who is most at risk for elevated levels of inflammation after the death of a spouse. In sum, this symposium will present data that could provide fundamental mechanistic information underlying grief, while simultaneously providing a foundation for future tailored interventions that could address both behavioral and biological vulnerabilities.

Individual Abstract Number: 1760
Mechanisms and trajectories underlying bereavement: A biobehavioral investigation
Christopher P. Fagundes, Ph.D., Psychology, Rice University, Houston, TX
Objective: Grief is conceptualized by strong negative emotions, which include longing, sadness, and preoccupations with thoughts, recollections, and images of the spouse. In the initial months after the loss of a spouse, those who are widowed are at risk for cardiovascular problems and premature mortality. In the general population, depression is characterized by chronic low-grade inflammation, a key predictor of cardiovascular problems, morbidity, and mortality. Although depression and grief share similarities, they are distinct constructs. We aimed to identify if grief was related to inflammation among those who had a spouse recently die. We also sought to determine if those who are widowed and already experience elevated levels of depressive symptoms compared with the general population had higher levels of inflammation compared with those who are widowed who report fewer depressive symptoms. **Methods:** Ninety-nine recently bereaved individuals (approximately 2 months after the loss) completed a blood draw and psychological assessments. Proinflammatory T cell-derived cytokines were assessed, which included interferon gamma (IFN-γ), interleukin (IL)-6, tumor necrosis factor alpha (TNF-α), IL17-A, and IL-2. They were then assessed three additional times over the course of the first year after the loss. **Results:** Immediately after the loss, bereaved individuals with a higher grief severity (using an established cut-score) had higher levels of the proinflammatory cytokines IFN-γ, IL-6, and TNF-α than those with less grief severity. Those who experienced higher levels of depression exhibited elevated levels of proinflammatory cytokines compared with those who had lower levels of depression. In our next set of analyses, which are currently being run and will be presented at APS, we will longitudinally examine inflammatory levels and HRV over the entire first year after the loss to determine rates and trajectories of change in inflammation and grief, as well as their relationship with depression. **Conclusions:** Given that grief is associated with depression, suicidality, morbidity, and mortality, understanding the biological mechanisms that underlie this event is of critical importance. These findings will contribute to our understanding of the complex mind-body interactions that occur when one loses a monogamous social partner.

Individual Abstract Number: 1761
Contribution of attachment theory for bereavement related immune dysregulation
Angie LeRoy, Ph.D., Psychology, Rice University, Houston, TX
Objective: Social relationships can impact immune function via the psychological stress-response. The degree to which an individual is high in attachment anxiety or avoidance, reflects unhealthy relationship patterns, which may influence adjustment to a losing a spouse. This study investigated the relationship between attachment style and poor loss adjustment, operationalized as greater levels of inflammation and depressive symptoms. We hypothesized that attachment anxiety, but not avoidance, would be associated with inflammation and depression, among individuals who had recently lost a spouse. **Methods**: One hundred recently bereaved participants (M= 84.74 days since spouse's passing, SD= 18.17) completed a series of questionnaires and underwent a single stick blood draw. Attachment variables were measured using the Experiences in Close Relationships – Relationship Structures Questionnaire. To measure the reactivity of the monocytes to challenge, we treated whole blood to induce cytokine/chemokine production; the outcome of this process reflects cellular immunity, which is a superior biomarker compared to levels of pro-inflammatory cytokines in the periphery. Interleukin-6 (IL-6), Tumor Necrosis Factor alpha (TNFα), and Chemokine ligand 4 (CCL4) were chosen for investigation because they were higher in bereaved individuals compared to healthy age-

matched controls, in a preliminary analysis. **Results**: Covariates included sleep quality, comorbidities, physical activity, age, sex, alcohol use, statin use, and the time since their spouse's passing. Anxious attachment was associated with monocyte stimulated IL-6 (b = .09, p=.02, sr^2 = .23) and CCL4 (b = .05, p=.04, sr^2 = .22), but not TNFα (b = .06, p=.14, sr^2= .15). Attachment avoidance was not associated with any of the individual pro-inflammatory biomarkers (IL-6, b =-.02, p=.37, sr^2 = -.09; CCL4, b = -.02, p=.25, sr^2 = -.12; TNFα, b = -.03, p=.25, sr^2 = -.12). Likewise, attachment anxiety (b = .89, p=<.001, sr^2 = .29), but not avoidance (b = -22, p=.15, sr^2 = -.12) was associated with depression. **Conclusions**: Attachment anxiety may be a risk factor for poor loss adjustment during bereavement; specifically, the relationship between this psychosocial factor and inflammation reflects the power of the mind to influence important processes in the body after stressful life events.

Individual Abstract Number: 1762

Grief, neighborhood context, and health disparities

Levi Saucedo, B.A., Psychology, Rice University, Houston, TX

Background: Bereavement is associated with both psychological and physical health problems; environmental factors that contribute to health disparities may exasperate these effects. It is now well established that chronic psychological stress primes the stress-response system-- promoting a more profound and prolonged stress-response to subsequent stressors. Neighborhood characteristics are an important predictor of chronic stress. In large urban cities, people's neighborhood characteristics differ dramatically by geographic location; while some individuals live in neighborhoods with low crime and abundant resources, others live in dangerous neighborhoods with very few resources. Neighborhood characteristics become increasingly important for mental and physical health as people age because older adults are more vulnerable to crime, and less mobile. In the current study, we sought to examine if those who are bereaved and live in lower "quality" neighborhoods show more psychological and physiological dysregulation (as indexed by levels of depressive symptoms, latent herpesvirus reactivation and heart rate variability (HRV)) than those who live in high quality neighborhoods with low crime and extensive resources. We will utilize state of the art Geographic Information System (GIS) software to answer these questions. GIS software accurately determines ethnicity concentrations, median income, crime (including violent vs. non-violent), walkability, and other important neighborhood characteristics. **Methods:** Using a random effect multi-level modeling approach, we will determine if neighborhood characteristics longitudinally impact latent herpesvirus reactivation, HRV, grief, and depression among 100 widows/widowers in the first year after the loss of a spouse. Participant addresses will be geocoded using readily available census tract data. This data has been collected and analyses are underway. We hypothesize that lower quality neighborhood characteristics will be associated with greater grief and depressive symptoms, HRV, and greater latent herpesvirus reactivation. **Conclusion**: This data will inform how neighborhood characteristics impact people undergoing a major life stressor and contribute to our understanding of how the mind and body interact with the environment to contribute to health disparities.

Individual Abstract Number: 1763

Body to mind: Peripheral inflammation and prolonged grief

Lydia Wu, B.A., Psychology, Rice University, Houston, TX

Background: Depression is an important contributor to total disease burden because of its high comorbidity with chronic illnesses and relatively high lifetime prevalence (Ustun et al. 2001). Major life stressors strongly predict depression onset, with the distress of interpersonal loss being especially associated with the emotional distress characteristic of depression (Slavich & Irwin 2014). According to the social signal transduction theory of depression, social stressors are biologically "converted" to create an internal environment that promotes inflammation and depression pathogenesis (Slavich & Irwin 2014). Though inflammation is not a necessary determinant of depression onset, many people with depression present an elevated inflammatory profile. Here, we aimed to test this theory in the spousally bereaved population, as spousal bereavement is ranked as the most stressful life event on the Social Readjustment Rating Scale (Holmes & Rate 1967). Notably, risk for depression is especially high during the first year compared to the non-bereaved population, as 46% of the bereaved population meet clinical criteria for major depressive disorder within the first seven months after the loss (Zisook and Schucter 1991). To date, no studies have examined the impact of inflammation on depressive symptoms over time in the spousally bereaved population. **Hypothesis:** Inflammatory levels at 2 months post-loss (V1) will predict depressive symptoms at 4 months post-loss (V2), such that elevated inflammatory levels at V1 will predict the maintenance or increase of depressive symptoms at V2. **Methods:**100 spousally bereaved individuals were evaluated at 2 and 4 months post-loss, as depression rates are highest within the first 6 months post-loss. At both visits, blood was collected in the morning to control for diurnal variation and the *Center for Epidemiological Studies in Depression Scale* was administered. CRP and LPS-stimulated T cell-derived proinflammatory cytokines were evaluated including IL-6, CCL4,TNF-α, IFN-γ, IL17-A, and IL-2. By examining biological processes that may promote adverse mental states, we provide strong evidence for a body-mind connection and integrate knowledge from the bereavement and depression literature to extend work on the social signal transduction theory of depression.