BROWN

MIND BRAIN RESEARCH DAY 2019

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TUESDAY, MARCH 26, 2019 • 11:00 am - 3:00 pm

SAYLES HALL AND SALOMON HALL
BROWN UNIVERSITY CAMPUS

POSTER ABSTRACTS

SLEEP DISTURBANCE AND SUICIDALITY IN COURT-INVOLVED YOUTH

Katelyn Affleck, PhD, Margaret Webb, Erik Hood, Selby Conrad, & Kathleen Kemp

Introduction

Suicidality is more prevalent among justice-involved youth than youth in the general population (Hayes, 2009). Prevalence rates of suicidality can vary based on the point in the juvenile justice process (National Action Alliance for Suicide Prevention, 2013). Prior studies of court-involved non-incarcerated or diverted youth found between 10% and 14% endorsed a lifetime history of suicidal ideation and attempts (SI/A) (Abram et al., 2008; Kemp et al., 2016). In non-justice involved youth, a growing body of literature has observed a relationship between suicidality and sleep problems (Barbe et al., 2005; Roberts et al., 2001). Sleep problems have been shown to be associated with suicidal thoughts (Bailly et al., 2004), attempts (Bailly et al., 2004; Nrugham et al., 2008), and death by suicide (Goldstein et al., 2008). These relationships have been found in clinical (Barbe et al., 2005) as well as community samples (Wong, Brower, & Craun, 2016). To date, while research has investigated the association between sleep problems and aggression in justice-involved youth (Ireland & Culpin, 2006), there is a lack of knowledge about the relationship between suicidality and sleep problems in justice-involved youth. The present study seeks to explore suicidality and sleep problems in a sample of court-involved youth.

Method

Participants and Procedures

The sample consists of 200 juveniles who completed full, non-emergency mental health evaluations at a Juvenile Court Clinic (JCC) in the Northeast between 2012-2014. For this study, a chart review of court mental health clinic records was conducted. All institutional IRB approvals were obtained.

Measures

As part of the mental health evaluation, juveniles and their caregiver were asked to report on the presence of sleep disturbance in the youth (e.g., difficulty falling asleep, difficulty staying asleep, difficulty waking) (coded as yes/no in chart review). Regarding suicidality, juveniles and their caregiver reported on the following areas of lifetime suicidality for the youth: suicidal ideation (SI), suicide attempt (SA), and self-harm (all coded as yes/no in chart review). Additionally, history of substance use, history of trauma exposure (each coded as yes/no in chart review) were controlled for in analyses as these variables have been identified as risk factors for suicidality in justice-involved youth (see Kemp et al., 2016).

Results

Among youth referred to the mental health clinic who completed a full mental health evaluation (N = 200), 34% (n = 68) endorsed a lifetime history of SI, 10% (n = 20) endorsed a lifetime history of SA, and 25.5% (n = 51) endorsed a history of self-harm. Of the participants, 56.6% (n = 113) endorsed experiencing sleep disturbance.

A logistic regression (LR) analysis was used to examine associations of SI, SA, and self-harm for 200 juveniles using sleep disturbance (yes/no) as a factor. When controlling for history of substance use and history of trauma exposure, the LR demonstrated a significant association between endorsement of lifetime self-harm and sleep disturbance and accurately predicted 76% of the cases [χ^2 (1, N=146) = 9.95, p < .01]. The results revealed that the odds of endorsing lifetime self-harm are 392% higher for every unit increase in the measure of sleep disturbance (p < .005). Associations were observed to be non-significant for sleep disturbance and SI (p = .29) or SA (p = .26).

Discussion

Based on the current sample, analyses revealed differences among reported sleep disturbance and self-harm in court-involved youth. Specifically, sleep disturbance appears to be a robust predictor of self-harm in court-involved youth even when controlling for other known risk factors for suicidality. Although sleep disturbance was not a risk factor for SI or SA in the current study, these findings may highlight the importance of assessing sleep as a potential treatment target to reduce self-harm behaviors with court-involved youth.

SOCIAL STRESS RELATED EPIGENETIC CHANGES ASSOCIATED WITH INCREASED HEART RATE VARIABILITY IN INFANTS

Ghazal Aghagoli, Elisabeth Conradt, James F. Padbury, Stephen J. Sheinkopf, Hasmik Tokadjian, Lynne M. Dansereau, Edward Z. Tronic, Carmen J. Marsit, Barry M. Lester

Early life stress can result in persistent alterations of an individual's stress regulation through epigenetic modifications. Epigenetic alteration of the NR3C1 gene is associated with changes in the stress response system during infancy as measured by cortisol reactivity. Although autonomic nervous system (ANS) reactivity is a key component of the stress response, we have a limited understanding of the effects of NR3C1 DNA methylation on ANS reactivity. To examine this relation, ANS stress responses of 26 term, 4-5 month old healthy infants were elicited using the face-to-face still-face paradigm, which involved five, 2-minute episodes. Two of these episodes were the "still-face" in which the mother was non-responsive to her infant. EKG was acquired continuously and analyzed in 30 second-intervals. Cheek swabs were collected, and DNA was extracted from buccal cells. Respiratory sinus arrhythmia (RSA) was measured as heart rate variability (HRV) using spectral analysis. Mean HRV was calculated for each 30 second "face to face" episode. DNA methylation of NR3C1 was calculated using bisulfite pyrosequencing. Percent DNA methylation was computed for each of the thirteen NR3C1 CpG sites. The relations between mean HRV for each "face to face" episode and percent DNA methylation at each CpG site was examined. Infants with higher percent methylation levels showed increased HRV at CpG sites 12 and 13 in the NR3C1 exon 1F promoter region. These data provide evidence that increased methylation of NR3C1 at CpG sites 12 and 13 is associated with increased activation of parasympathetic pathways as represented by increased RSA.

THETA BURST TRANSCRANIAL MAGNETIC STIMULATION FOR POSTTRAUMATIC STRESS DISORDER

Emily Aiken, MA, CCRP, Jennifer Barredo, PhD, Victoria C. Larson, BS, Richard N. Jones, ScD, M. Tracie Shea, PhD, Benjamin D. Greenberg, MD PhD, Mascha van 't Wout, PhD, Noah S. Philip, MD*

OBJECTIVE: Posttraumatic Stress Disorder (PTSD) is a highly prevalent, chronic psychiatric disorder associated with disruption in social and occupational function. To this end, transcranial magnetic stimulation (TMS) represents a novel approach to PTSD. Intermittent theta-burst stimulation (iTBS) is a new, more rapid administration protocol with data supporting efficacy in depression.

METHODS: Fifty Veterans with PTSD received ten days of sham-controlled iTBS (1800 pulses/day), followed by ten unblinded sessions. Primary outcomes were feasibility and acceptability, then changes in PTSD, quality of life, social and occupational function, and depression. Mixed model analyses evaluated efficacy up to one-month post-treatment. We acquired resting state fMRI on an eligible subset (n=26) to identify response predictors.

RESULTS: Active iTBS significantly improved social/occupational function (Cohen's d=0.39; p=0.04), and produced a trend towards depression improvement (d= -0.45; p=0.07), and moderate (nonsignificant) effect sizes on PTSD (d= -0.34). Mixed models indicated superiority of active iTBS on PTSD (d= -0.5), depression (d= -0.45), and social and occupational function (d=0.9) (all p<0.001). Improvement generally occurred within the first week.
Retention was high, side effects consistent with standard TMS, and blinding was successful. Neuroimaging indicated that clinical improvement was predicted by stronger (greater positive) connectivity within the default mode network (DMN), and by anticorrelated (greater negative) cross-network connectivity (FDR-corrected p<0.05).

CONCLUSIONS: In this first sham-controlled study, iTBS appears to be a promising new treatment for PTSD. Most clinical improvements occurred early, necessitating further investigation of optimal iTBS time course and duration. Consistent with prior TMS neuroimaging studies, DMN connectivity played an important role in response prediction.

Trial Registration: ClinicalTrials.gov Identifier: NCT02769312

INCREASED MARIJUANA USE AMONG ADOLESCENTS WITH A DIAGNOSIS OF DEPRESSION

Gabriela Aisenberg, BS, Lauren Micalizzi, Anthony Spirito

There is evidence that rates of depression are elevated in those who use marijuana frequently or who are dependent on marijuana. Proposed reasons for this overlap include a shared neurobiological mechanism (i.e., the cannabinoid system) and shared social or demographic factors (e.g., adverse life events, peer affiliations; Degenhardt et al., 2003). Marijuana use may impede the effectiveness of evidence-based treatments for depression (Leadbeater, Ames, Linden-Carmichael, 2018) and given the high rates of marijuana use among adolescents, there is a need to better understand the prevalence and mechanisms involved in marijuana use in depressed adolescents in order to refine treatment approaches in this population. The purpose of this study is to obtain a more complete understanding of marijuana use in adolescents with depression amongst a high-risk sample seeking treatment at a community mental health clinic. These data were drawn from the baseline assessment of a larger intervention study (Wolff et al., in prep). The sample comprised 101 adolescents (ages 13-18; mean age 15.72; 43% female). Participant self-reported the number of days that they used marijuana over the previous 30 days using the Drug Use Questionnaire (DUQ). The presence of a current depression diagnosis was determined by Master-level clinicians using the Kiddie Schedule for Affective Disorder and Schizophrenia (KSADS). An independent samples t-test was conducted to evaluate mean differences in past 30-day marijuana use among adolescents who had a current diagnosis of depression compared to those who did not have a diagnosis of depression.

Forty adolescents met diagnostic criteria for depression. Adolescents with a diagnosis of depression smoked marijuana an average of 12.25 days (SD= 11.48; Median=8.0; Range=0-30) over the past 30 days, while those without depression smoked marijuana an average of 7.3 days (SD=9.35 Median=2.5; Range=0-30), $t(df = 94, n = 101) = -2.37$, $p = .02$. Hedges' g (a measure of effect size weighted according to the relative size of each sample which can be interpreted with the same thresholds as Cohen's d) across these two populations was a .46, indicating a medium effect size.

These results add to the growing body of literature in this area indicating that marijuana use is higher among a sample of high-risk, depressed adolescents. Causality cannot be determined in this cross-sectional data. More research is needed to better understand the mechanisms involved in marijuana use in depressed adolescents to establish effective prevention and treatment strategies and to enhance the efficacy of established interventions.

NEGATIVE EMOTIONAL ACTION TERMINATION (NEAT) IMPAIRMENT MEDIATES THE RELATIONSHIP BETWEEN CHILDHOOD TRAUMA AND SUICIDAL BEHAVIOR: EVIDENCE FOR A NEUROBEHAVIORAL "SCAR" OF EARLY ABUSE AND NEGLECT FROM A PSYCHIATRIC INPATIENT SAMPLE

Kenneth Allen, PhD, Heather Schatten, Ph.D., Nicole Nugent, Ph.D., & Michael Armey, Ph.D.

Early traumatic experiences increase risk for future suicidal behavior. Emotion dysregulation is a proposed mechanism for this increased risk; childhood trauma exposure may adversely influence the development of neurocognitive systems involved in regulating affect and behavior. Poor inhibitory control over emotion-related impulses may thus help explain the relationship between early trauma and suicide. Negative Emotional Action Termination (NEAT), or late-stage negative emotional response inhibition, is one metric of this function. NEAT refers to the ability to inhibit reflexive negative affective reactions after accompanying motor responses have been initiated. Negative urgency, a construct closely tied to emotion dysregulation, may reflect underlying NEAT deficits. Nonsuicidal self-injury, a risk factor for suicide, is also associated with impaired NEAT. In this ongoing study of adult psychiatric inpatients (current n=33), we examined whether NEAT and the Difficulties in Emotion Regulation Scale (DERS) account for shared variance in history of early maltreatment and suicidal behaviors, assessed with the Childhood Trauma Questionnaire (CTQ) and interviews conducted shortly after hospital admission. Cross-sectional mediation analyses (covarying age and sex) indicated total c-path effects of the CTQ on lifetime (β=1.92; SE=0.57; t=3.39, p<.01) and past-month (β=1.08; SE=0.38; t=2.81, p=.01) frequency of suicidal behaviors. As hypothesized, CTQ scores had indirect ab-path effects through NEAT (lifetime β=1.00; SE=0.49; t=2.22, p<.05; past-month β=0.69; SE=0.29; t=2.20, p<.05), which suggested full mediation, i.e., no direct c'-path effects of trauma after accounting for NEAT. DERS had no effects in models with the CTQ and NEAT, which explained about half of the variance in history of suicidal behaviors. In sum, NEAT deficits fully explained associations between history of childhood trauma and suicidal behaviors in psychiatric inpatients, over the lifetime and month prior to hospitalization. This talk will contextualize these preliminary results, which suggest that neurobehavioral markers of emotional inhibitory dysfunction may index a "scar" of early trauma. Interventions would benefit from intermittent data collection regarding visibility, believability, and dissemination of social norms data.

THE AUTISM AND DEVELOPMENTAL DISORDERS INPATIENT RESEARCH COLLABORATIVE: CHARACTERISTICS OF INDIVIDUALS WITH AUTISM RECEIVING SPECIALTY INPATIENT PSYCHIATRIC CARE

Eliza Appleton, BS, Monica Trevino, Giulia Righi, Matthew Siegel

The Autism and Developmental Disorders Inpatient Research Collaborative (ADDIRC) is a multi-site study established in 2013 to examine the characteristics of individuals with autism spectrum disorder (ASD) who require treatment in specialized psychiatric inpatient units. This sample is traditionally excluded from research participation, and significantly underrepresented in the autism literature. Participants are eligible for joining ADDIRC on admission into one of six specialized inpatient hospital units within the ADDIRC network located in ME, RI, MD, PA, OH, and CO. Participants must also have a possible ASD diagnosis and be between the ages of 4 and 21. Genotypic and phenotypic data are gathered during the initial inpatient stay and any subsequent readmissions, if applicable. Caregivers provide demographic information, medical history, and family medical history. Additionally, caregivers complete several standardized measures assessing adaptive and behavioral presentation. During admission, participants are administered standardized measures of language functioning, intellectual functioning, and ASD symptom severity. The clinical team provides information about psychiatric presentation. Here we provide a description of participants across the six specialized inpatient hospitals and present descriptive analyses of relevant demographic data, psychiatric pathologies, and medical co-morbidities. As the study is ongoing, we report on future direction which includes the introduction of physiological measurements and their relationship to maladaptive behaviors in the ASD sample. ADDIRC is a unique multi-site network which provides critical information to patients, their families, and specialists treating the full ASD phenotypic range in acute specialized inpatient units.

PREDICTING AMYLOID-BETA DEPOSITION USING A NOVEL COGNITIVE RISK SCORE

Breton Asken, MS, ATC, Karysa Britton, Athene Lee, Jennifer Davis, Brian Ott, Paul Malloy, Stephen Salloway, Stephen Correia

Background: PET imaging can quantify brain Aβ burden to aid differential diagnosis of suspected neurodegenerative disease. Improved prediction of Aβ burden using cognitive test scores could help identify etiology without requiring invasive PET procedures. We evaluated the relationship between PET-derived global Aβ burden and a novel cognitive risk score calculated from performance across a comprehensive neuropsychological test battery.

Methods: Data came from the multicenter Imaging Dementia – Evidence for Amyloid Scanning (IDEAS) project. We computed Total (range=0-9) and domain-specific (Memory, Language, Executive Function; range=0-3 for each) cognitive risk scores and evaluated their association with PET-Aβ global standardized uptake value ratio (SUVr). PET-Aβ status was then dichotomized (positive [+] vs. negative [-]) for binary logistic regression and area under the receiver operating characteristic curve (ROC/AUC) analyses.

Results: Complete data were available for 72 participants (age 75.4 ± 5.7 years, 53% female, 75% PET-Aβ[+]). Higher cognitive risk scores were moderately associated with higher global SUVr (r=.372, p=.001). Only Memory remained associated with PET-Aβ SUVr after controlling for other domains (β=.255, p=.036). Cognitive risk scores did not differentiate PET-Aβ[+] from PET-Aβ[-] participants. ROC/AUC analyses indicated that Total cognitive risk score (AUC=.718, 95%CI .569-.867) suboptimally classified PET[+] and PET[-] participants, but outperformed the Mini Mental State Exam (MMSE; AUC=.364, 95%CI=.217-.511).

Discussion and Conclusions: Cognitive test scores, particularly memory, moderately relate to PET-derived Aβ burden. However, these scores alone should not dictate appropriateness for collecting amyloid PET when it is clinically indicated. Integrating cognitive scores with other less invasive biomarkers (e.g., blood-derived) may reduce unnecessary procedures.

FOXOs PROMOTE METABOLIC STABILITY IN AGED AND TUMORIGENIC NEURAL STEM CELLS

Amanda J. Audesse, BS, Zachary Gardell, Nelli S. Lakis, Douglas Anthony, Alexander S. Brodsky, Nikos Tapinos, Ashley E. Webb

Tight metabolic regulation is essential to maintain stem cell homeostasis and support healthy aging. In the aging brain, altered metabolic profiles induce neural stem cell (NSC) dysfunction and are associated with reduced neurogenesis but the underlying mechanisms have yet to be elucidated[1]. Our previous work identified the pro-longevity transcription factor FOXO3 as a key regulator of NSC homeostasis and quiescence[2,3]. Here, we identify FOXO3 as a critical regulator of metabolic stability in stem cells in the aged brain and in high grade glioma. In this study, we used a genomics approach to investigate the mechanism by which FOXO supports the quiescent state in stem cells in the context of healthy aging and cancer. We performed RNA-seq on freshly isolated quiescent NSCs from aged mice with or without FOXO3 ablation. Interestingly, we found that in aged quiescent neural stem cells, FOXO3 functions to restrain expression of genes involved in mitochondrial function and oxidative metabolism. Transcriptome profiling of high-grade human glioblastomas and functional analysis in patient-derived glioma stem cells suggest a similar function of FOXO3 in the context of cancer. Together, these findings suggest that aged quiescent NSCs and glioma stem cells undergo a "metabolic drift" and exhibit characteristics of premature activation in the absence of FOXO3. Thus, FOXO3 maintains metabolic homeostasis in quiescent NSCs to prevent the premature depletion of NSCs during aging and brain tumor growth in humans.

1Beckervordersandforth, R. et al. Neuron 93, 560-573 e566 (2017).
2Webb, A.E et al, Cell Reports 4, 477-491 (2013).
3 Renault, V. M. et al, Cell stem cell 5, 527-539 (2009).

BRIDGING THE MIND, BODY, AND SOCIOPOLITICAL: A CASE STUDY OF A DREAMer WITH UNEXPLAINED TREMORS

Pranav Aurora, BS, Jonathan Kole, MD, MBE

A 17-year-old Brazilian-American female with controlled Hashimoto's thyroiditis presents with worsening left arm tremulous movements. Extensive workup by four neurologists reveals normal labs, negative EEGs, and multiple unremarkable MRIs. She is a high-achieving student with nurturing and connected family without any identified trauma. Of note, her legal residence is protected only under the Deferred Action for Childhood Arrivals (DACA) program. In first psychiatric consultation, she recognized that the tremulous movements started as a preteen when she learned of her precarious citizenship status. She was diagnosed with Conversion Disorder and started psychotherapy and fluoxetine with reported improvement but persistence of tremors at 1 and 3 month follow-up visits.

We explore this patient case using structural competency and other theories of health justice to discuss how the anti-immigrant climate in the U.S. affects the mental health of vulnerable adolescents. This case demonstrates a need for sociopolitical analysis in the clinic alongside the biopsychosocial model to more critically understand and address the root causes of pathology.

MUTATIONS IN MITOCHONDRIAL ENZYME GPT2 CAUSE METABOLIC DYSFUNCTION AND NEUROLOGICAL DISEASE WITH DEVELOPMENTAL AND PROGRESSIVE FEATURES

Ozan Baytas, BSc, Qing Ouyang, Chendong Yang, Michael Schmidt, Eric M. Morrow.

Mutations that cause neurological phenotypes are highly informative with regard to mechanisms governing human brain function and disease. We report autosomal recessive mutations in the enzyme glutamate pyruvate transaminase 2 (GPT2) in large kindreds initially ascertained for intellectual and developmental disability (IDD). GPT2 [also known as alanine transaminase 2 (ALT2)] is one of two related transaminases that catalyze the reversible addition of an amino group from glutamate to pyruvate, yielding alanine and α-ketoglutarate. In addition to IDD, all affected individuals show postnatal microcephaly and~80% of those followed over time show progressive motor symptoms, a spastic paraplegia. Homozygous nonsense p.Arg404* and missense p.Pro272Leu mutations are shown biochemically to be loss of function. The GPT2 gene demonstrates increasing expression in brain in the early postnatal period, and GPT2 protein localizes to mitochondria. Akin to the human phenotype, Gpt2-null mice exhibit reduced brain growth. Through metabolomics and direct isotope tracing experiments, we find a number of metabolic abnormalities associated with loss of Gpt2. These include defects in amino acid metabolism such as low alanine levels and elevated essential amino acids. Also, we find defects in anaplerosis, the metabolic process involved in replenishing TCA cycle intermediates. Finally, mutant brains demonstrate misregulated metabolites in pathways implicated in neuroprotective mechanisms previously associated with neurodegenerative disorders. Overall, our data reveal an important role for the GPT2 enzyme in mitochondrial metabolism with relevance to developmental as well as potentially to neurodegenerative mechanisms.

SYMPTOM PROFILE SUBTYPES PREDICT TREATMENT RESPONSE TO 5 Hz REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION IN MAJOR DEPRESSIVE DISORDER AND CO-MORBID POST-TRAUMATIC STRESS DISORDER

Yosef Berlow, MD, PhD, Katherine A. Grisanzio, Scott L. Flemming, Abdullah P. Rashed Ahmed, Emily M. Aiken, Linda L Carpenter, and Noah S Philip

Background: The diagnostic categories defined by DSM often encompass a heterogeneous set of symptom profiles that may reflect differences in the underlying etiology, pathogenesis and prognosis of the condition. Grisanzio and colleagues have demonstrated that some of this heterogeneity can be quantified though dimensional analysis of the Depression Anxiety Stress Scale (DASS) and using this approach, they identified six trans-diagnostic symptom profiles that were associated with unique patterns of neuropsychological performance, neurophysiological measurements (EEG), and measurements of functional capacity (Grisanzio KA, Goldstein-Piekarski AN, Wang MY, Rashed Ahmed AP, Samara Z, Williams LM. Transdiagnostic Symptom Clusters and Associations with Brain, Behavior, and Daily Function in Mood, Anxiety, and Trauma Disorders. JAMA Psychiatry. 2018; 75(2):201-209). The current study investigated whether classifying patients at baseline using these symptom profiles would have prognostic value in predicting treatment response in patients with Major Depressive Disorder (MDD) and comorbid Posttraumatic Stress Disorder (PTSD) receiving repetitive transcranial magnetic stimulation (rTMS).

Methods: Clinical rating scale data from 35 subjects with both PTSD and MDD who participated in an open label trial of 5 Hz rTMS were used in the study. Using item level data from baseline DASS scores, three primary components, labeled Anhedonia, Anxious Arousal and Tension, were calculated for each subject based on the principal component analysis described by Grisanzio et al. A linear discriminant model was constructed using a simulation of the Grisanzio et al. data set. This model was used to classify subjects into one of six pre-defined symptom profiles: Normative Mood, Tension, Anxious Arousal, Generalized Anxiety, Anhedonia and Melancholia. Post treatment remission rates and response to rTMS defined by the Inventory of Depressive Symptomatology Self Report (IDS-SR) and percent change in the PTSD Checklist for DSM-5(PCL-5) were then assessed across profile subtypes.

Results: All six symptoms profiles were identified in this sample in the following proportions: Anxious Arousal (43%), Anhedonia (20%), Tension (14%), Normative Mood (14%), General Anxiety (6%), and Melancholia (3%). Post-treatment depression remission rates (defined by IDS-SR scores less than 14) differed significantly across symptom profile subtypes (Fisher's exact test (FET), p=0.04), with Anxious Arousal representing the group with the lowest remission rate (13%, n=2/15) and Tension (80%, n=4/5) and Melancholia (100%, n=1/1) representing the groups with the highest remission rates. When compared to all other subtypes, subjects classified as belonging to the Anxious Arousal subtype were less likely to remit compared all other subtypes (FET, odds ratio 0.16, p = 0.034). Subjects in the Anxious Arousal subtype also demonstrated nominally smaller reduction on the PCL-5 after rTMS compared to all other subtypes (21% vs. 46%; t(33)=2.025, p=0.051) and were less likely to complete the treatment series (FET, odds ratio 0.066, p = 0.011). The Anxious Arousal component score appeared to drive this effect and a simple model using a cutoff score of 1.0 for this standardized component at baseline yielded reasonable separation between subjects who later met post-treatment remission criteria and those who did not, correctly classifying 74% of the sample with sensitivity of 0.83 and specificity of 0.70.

Conclusion: This study offers preliminary evidence of the feasibility and utility of applying these trans-diagnostic symptom profiles to other samples using linear discriminant analysis and suggests that these subtypes differ in their response to treatment with rTMS. These results imply that classifying individuals according to these trans-diagnostic symptom profiles may offer a simple and inexpensive method to help guide rTMS treatment decisions.

EXPERIENCES OF VIOLENCE ABUSE RECOGNITION AND PERCEPTION OF PEER NORMS AMONG RHODE ISLAND MIDDLE SCHOOL STUDENTS

Vanessa Biniungo, BA, Jillian Ganache, Katherine W. Bogen, Mazheruddin M. Mulla, Emily Toma, Lindsay Orchowski

Intro: Student-on-student aggression, such as fighting, bullying, harassment, name-calling, and racial taunts, is one of the most common forms of violence across the social ecology (Dinkes et al. 2009). Moreover, dating and sexual violence (DV/SV) are problems among U.S. high school students, with 20.9% of female students and 10.4% of male students experiencing relationship violence (Vagi et al. 2013). Violence victimization increases student risk of poor academic performance, school absences, mental health challenges, attempted suicide, episodic heavy drinking, somatic complaints, visits to the school nurse, physical fighting, and unprotected sex (CDC, 2006; Hammig & Jozkowski, 2013; Holt et al., 2013; Juvonen et al., 2011; Miller, 2010; Nishina, Juvonen, & Witkow, 2005). Further, health issues resultant from childhood victimization may continue into adulthood (Copeland et al. 2013). Importantly, social norms interventions – or, interventions that seek to shift community norms and correct misperceptions regarding the acceptability of problem behaviors – have been developed to reduce victimization among middle and high school students (Berkowitz, 2010; Perkins et al., 2011). Additionally, recognition of abuse is associated with use of resources and behaviors to reduce victimization within the community (Miller et al., 2015).

Goal of the current study: To understand the extent to which different forms of violence victimization (bullying, dating violence, sexual harassment) and perpetration (bullying, dating violence, and sexual harassment) are predictive of recognition of abusive behaviors and perception of peer attitudes regarding violence among Rhode Island middle school students.

Hypothesis: Violence victimization will increase the likelihood of recognizing abusive behaviors and increase student belief their peers perceive violence as acceptable, whereas perpetration will reduce likelihood of recognizing abuse and increase perceived peer acceptability.

Method: Middle school students (N=3017) at 7 Rhode Island middle schools completed an anonymous survey as part of a larger CDC-funded study. Measures of sexual harassment and DV were adapted from Shifting Boundaries (Taylor et al., 2013). Measures of bullying perpetration and victimization were modified from School Crime Supplement (NCES, 2013) and the Illinois Bully Scale (Espelage & Holt, 2001). Recognition of abuse was modified from Rothman et al. (2006) and Miller et al. (2012). The perception of peer norms measure was designed for the purpose of the larger study, and included items such as "what percent of students at this school are bothered when students spread sexual rumors?"

Results: multiple regression analyses were conducted in SPSS to examine the influence of violence victimization and perpetration on dependent variables of abuse recognition and perception of peer norms. Results of the final models indicated that only sexual violence perpetration was predictive of abuse recognition and perception of peer norms after accounting for other independent variables.

Discussion/Conclusion: Sexual violence perpetration was predictive of poorer abuse recognition and perception that peers were more accepting of violence. Sexual violence perpetration and victimization is a critical area for intervention, as interventions focused on mitigating sexual violence may improve student capacity to recognize problem behaviors across the full spectrum of violence. Moreover, social norms interventions that incorporate aspects of SV prevention may be particularly well-suited to address student misperceptions of peer beliefs. Notably, given the impact of childhood victimization across the lifespan, such interventions may have a lasting effect on health, achievement, and abuse recognition skills. Future interventions addressing school violence should incorporate age-appropriate sexual violence prevention activities, such as skits and empathy exercises, to maximize impact.

PERSONALITY AND MINDFULNESS PRACTICE: DOES PERSONALITY PREDICT ENGAGEMENT IN MINDFULNESS FOR COLLEGE STUDENTS?

Jason Blizzard, PhD; Bernadette Heckman, PhD; Erica Eaton, PhD; Jonathan Shay, MEd

During the last 25 years, the amount of research conducted in mindfulness has grown exponentially. As a result, researchers have identified numerous beneficial effects of mindfulness for college students, including reduction in stress and anxiety, and increased emotional adaptiveness. As mindfulness research has developed, it has begun to integrate into other domains of psychological inquiry, such as personality. This integration, however, is a relatively new branch of mindfulness research and as such, there are many gaps in the literature on mindfulness and its interface with personality traits. Accordingly, the purpose of this study is to investigate the crossing point between mindfulness and personality among a college student population. Specifically, this study examined how the Big Five personality traits (extraversion, conscientiousness, agreeableness, openness to experience, and neuroticism) related to trait mindfulness, mindfulness self-efficacy, and the frequency with which college students engage in mindfulness practice. Participants (N = 105; mean age = 20.9 years; 81.9% female; 63.8% White) were college students at a large university in the southeastern United States who voluntarily signed up to receive two one-hour in-person group training sessions in mindfulness. Outcome measures were administered on-line via Qualtrics and included the Mindful Attention Awareness Scale (MAAS) and the Mindfulness Self-Efficacy scale (MSE). In addition, participant engagement in a mindfulness module administered through Qualtrics was tracked for four weeks post-training to determine the number of days participants practiced mindfulness.

Correlational analyses yielded no significant findings between personality variables and the number of days participants meditated after receiving the study's training intervention. Additionally, personality traits were not related to mindful attention and awareness (trait mindfulness) or to mindfulness self-efficacy. Lastly, the regression analyses did not reveal a predictive relationship between any personality variables and any of the outcome measures (Days Meditated, MAAS, MSE), despite two of the overall models yielding significant results. One notable but unexpected finding was a strong significant positive correlation between the male gender variable and number of days meditated. It is possible that personality variables can predict mindfulness engagement best when they are viewed in the context of the self-identified gender identity of the person practicing. This research could guide future investigation into the effects of mindfulness in college students, particularly in further understanding the relationship between gender and mindfulness practice.

SUBSTANCE USE, DEVIANCE, VIOLENCE, AND MEASURES OF CONNECTEDNESS AMONG RHODE ISLAND MIDDLE SCHOOL STUDENTS

Katherine Bogen, BA, Lauren K. Hunt, Margaret Mackin, Mazheruddin M. Mulla, Lindsay Orchowski

Background: School connectedness - the belief held by students that adults and peers in the school care about their learning as well as about them as individuals - is a significant predictor of myriad student outcomes (CDC, 2018). Students who report high levels of school connectedness are less likely to experience depression, anxiety, engage in substance abuse or high-risk transport behaviors, or to sustain related injuries (Blum, 2005; Chapman, Buckley, Sheehan, Shochet, Romaniuk, 2011; CDC, 2018). Conversely, students reporting lower levels of school connectedness are vulnerable to poor academic performance, tobacco use, other substance use, emotional distress, experiences of violence, and gang involvement (Blum, 2005; Bond et al., 2007; CDC, 2018). According to the Youth Risk Behavior Survey, middle school students in Rhode Island experience health risk debut during grades 6-8 (YRBS 2017). Previous interventions addressing levels of school connectedness among middle school youth have found whole-school interventions to be effective in increasing connectedness, improving grades and test scores, increasing engagement in positive youth activities, and decreasing misconduct, delinquency, and problematic externalizing behaviors (Battistich, Schaps, & Wilson, 2004). Clearly, addressing school connectedness among middle school students is a critical and promising avenue for improving youth outcomes and mitigating health risk behaviors.
Current Study: The present research examined school connectedness among Rhode Island middle school students. Surveys were collected as part of a larger CDC-funded study evaluating a social norms-based dating and sexual violence prevention program.
Method: Middle school students (N=3017) at 7 Rhode Island schools completed an anonymous survey. Students indicated whether they had ever drank alcohol, smoked marijuana, used any other substances, received detention, or been suspended or expelled. Students were also asked to describe their overall grades in school, and how much they agreed with the statement, "My friends get in a lot of trouble." School connectedness was modified from McNeely et al. (2002). Measures of sexual harassment and dating violence victimization and perpetration were adapted from Shifting Boundaries (Taylor et al., 2013). Measures of bullying perpetration and victimization were modified from School Crime Supplement (NCES, 2013) and the Illinois Bully Scale (Espelage & Holt, 2001).
Results: Forward stepwise multiple regression analyses were conducted in SPSS to examine the influence of risk-behavior variables and grades on the dependent variable of school connectedness. Results of the final model indicated that only dating violence victimization and perpetration were significantly negatively correlated with school connectedness after accounting for all other independent variables.
Discussion/Conclusion: Dating violence (perpetration and victimization) were most predictive of school connectedness. Peer deviance and academic achievement were initially strong indicators of school connectedness but ultimately lost predictive strength when more variables. However, they may still provide promising avenues for intervention. Interventions focusing on school connectedness may have lasting impacts on student health and academic performance, and should include programming to specifically address dating violence. Intervention components may include: one-on-one time with teachers and support staff; discussions of relationship red flags/healthy relationships in school; training parents to recognize dating violence & effectively intervene; mediated relationship-building with peer groups (advisory, assembly); and support from school counselors and social-workers Finally, research on middle school dating violence should assess whether violence is occurring in school or outside of school; interventions should be designed accordingly.

PREFERENCES, PERCEPTIONS, AND USE OF FLAVORED ELECTRONIC CIGARETTES IN PREGNANT WOMEN

Katelyn Borba, BA, Hannah Dalglish, George D. Papandonatos, Meaghan McCallum, Lori A.J. Scott-Sheldon, & Laura R. Stroud

Background: Electronic cigarettes (e-cigarettes) are popular devices designed to heat a liquid (often containing nicotine) to generate vapor that is inhaled. Because e-cigarettes do not involve combustion of tobacco, which has been linked to many of the adverse health effects of conventional cigarettes, they were initially marketed as healthier and safer alternatives to conventional cigarettes. Rates of e-cigarette use have rapidly increased since their introduction to the US in 2007, doubling annually between 2008 and 2014, with recent studies estimating 1-15% of pregnant women use e-cigarettes. Flavors may increase the appeal of e-cigarettes particularly in attracting new users, women, and vulnerable populations. Specifically, particular preferences for sweet flavored e-cigarettes have been shown among youth, women, and cigarette smokers trying to quit. Given recent increases in the prevalence of e-cigarettes, evidence for use of e-cigarettes among pregnant women, and availability of a variety of flavored products, we examined use, preferences, and perceptions of e-cigarette flavors in a sample of pregnant cigarette smokers and non-smokers. We also utilized a novel latent factor mapping approach to identify clusters of flavor preferences among pregnant women.
Methods: Use, preferences, and perceptions of flavored e-cigarettes were investigated in an ethnically/racially diverse, low-income sample of pregnant women (N = 100; 50% conventional cigarette smokers, Mage = 26; 66% low income; 65% minorities) via detailed interviews during third trimester (M = 34±1 weeks). Participants completed the Tobacco Flavors Interview to assess perceptions and preferences for e-cigarette flavors (Scott-Sheldon & Stroud, 2015) and an adapted Timeline Followback interview to assess flavored e-cigarette use across each day of pregnancy and 3 months prior.
Results: Nearly half (45%) of participants endorsed lifetime e-cigarette use and 16% endorsed use during the peripartum (9% during preconception, the 3 months prior to pregnancy; 9% during pregnancy; 3% within one month postpartum). Fruit (69%) and mint (19%) were the most commonly used e-cigarette flavors during pregnancy. Pregnant women endorsed increased use of fruit flavored e-cigarettes in preconception and pregnancy, greater preferences and intentions to use sweet flavors (fruit and candy), and lowest preferences for tobacco flavors (ps<.05). Unexpectedly, perceptions of general, pregnancy, and fetal-related health risks did not significantly differ across flavors of e-cigarettes. Latent factor mapping (biplots) were then utilized to identify clustering of perception measures by flavors, and flavors by perception measures. This novel analysis revealed clustering of more-preferred fruit and candy flavors versus least-preferred tobacco flavored e-cigarettes, with other sweet flavors—mint and alcohol—clustering more closely with fruit and candy flavors, and more pungent flavors—spice, coffee, chocolate—clustering near tobacco. Finally, preference for fruit and mint flavored e-cigarettes and decreased harm perceptions significantly differentiated lifetime e-cigarette users from non-users (ps<.05).
Conclusions: Results highlight preferences for fruit and mint flavored e-cigarettes, and links between preferences for fruit and mint flavors and lifetime use of e-cigarettes in pregnant women. Findings also highlight the utility of latent factor mapping/correspondence analysis for elucidating clustering of flavor perceptions and preferences for novel tobacco products. As regulatory policies regarding flavors in e-cigarettes and other tobacco products are being crafted (U.S. Food and Drug Administration, 2018), it may be relevant to consider that pregnant women are another population who shows preference for sweet-flavored e-cigarettes and that such flavors, especially fruit and mint, were associated with lifetime e-cigarette use prior to pregnancy.

SHORT AND LONG-TERM WEIGHT LOSS OUTCOMES IN A STANDARD BEHAVIORAL WEIGHT LOSS INTERVENTION COMPARED TO PREVENTION-FRAMED AND PROMOTION-FRAMED TREATMENTS

Rebecca Boswell, MS, MPhil, Rena R. Wing, Kathryn E. Demos

Background: Over two-thirds of the United States population is currently overweight or obese (body mass index ≥25 kg/m2). Individuals with overweight or obesity are at risk for higher rates of health problems, including heart disease, cancer, and diabetes. On average, behavioral weight loss (BWL) interventions are successful in producing modest yet clinically significant weight losses of 5-10% of initial body weight. Nevertheless, up to 90% of individuals regain weight following treatment.

Innovative adaptions of BWL could improve weight loss outcomes. Dr. Demos and Dr. Wing recently developed two future-oriented BWL interventions based on cognitive framing: (1) an enhanced program focused on promoting future benefits of making healthier choices (PROMOTE), and (2) an enhanced program focused on preventing future negative consequences of unhealthy choices (PREVENT). In a randomized control trial (N=96) enhanced BWL with cognitive framing about disease prevention (PREVENT) led to better initial weight loss outcomes than either including cognitive framing about health promotion (PROMOTE) or the gold-standard BWL. However, the comparative longer-term efficacy of these enhanced BWL programs remains unknown.

Methods: Participants who previously participated in 12-week PREVENT, PROMOTE, or standard BWL interventions at the Weight Control and Diabetes Research Center (WCDRC) returned to complete a follow-up assessment 9-12 months post-treatment. As was done at baseline (pre-treatment) and immediately post-treatment, height and weight were measured at follow-up. To date, 30 participants have completed the 9-to-12 month follow-up, and data collection for this final time-point is ongoing.

Results: Similar to the total study sample, there was a significant difference in initial percent weight loss by treatment arm in this subset (N=30), such that PREVENT produced the greatest weight loss (p= .05; PREVENT: -7.75% ± 4.92; PROMOTE: -3.19% ± 4.03; Standard: -3.73% ± 4.57).

At 9-to-12 months, participants had re-gained weight, maintaining an overall average percent weight loss of -2.57% ± 7.84. Although a pattern similar to the observed short-term weight loss data persisted, overall percent weight loss from baseline to 9-12 months post-treatment did not significantly differ by treatment arm (p=.28; PREVENT: -4.94% ± 7.34; PROMOTE: .02% ± 7.66; Standard: -3.82% ± 8.71). Weight loss maintenance (percent weight change from post-treatment to follow-up) also did not differ as a function of treatment arm (p=.60; PREVENT: 3.03% ± 5.78; PROMOTE: 3.29% ± 6.01; Standard: .04% ± 9.53). While on average only individuals in PREVENT achieved clinically significant weight loss >5% at 9-12 months, there were no differences in rates of successful weight loss by treatment arm (p=.47).

Conclusion: Although 12 weeks of BWL incorporating prevention-focused cognitive framing improves initial weight loss, these effects may not persist through weight loss maintenance (i.e., post-treatment). However, given that prevention-focused BWL led to clinically significant long-term weight loss, further research with larger samples is necessary. Future work should investigate factors that may influence weight loss maintenance and consider whether targeting these factors during treatment may improve long-term outcomes.

LINKING SLEEP AND AGGRESSION: THE ROLE OF RESPONSE INHIBITION AND EMOTIONAL PROCESSING

Melanie Bozzay, MA, Edelyn Verona, PhD

Introduction: Although insufficient sleep (<7 hours a night) is theorized to increase the risk of engaging in aggressive behavior, experimental studies examining this relationship yield conflicting findings. Since sleep functions in part to regulate the functioning of prefrontal brain regions, insufficient sleep may deleteriously impact the individual's ability to inhibit rash action and process emotional information, which could in turn increase aggressive tendencies. However, no studies have examined the extent to which naturally occurring insufficient sleep is linked to aggression, and none have studied potential underlying mechanisms of this relationship, limiting understanding of the nature of this relationship and the generalizability of extant findings. Thus, the present study examined whether cognitive (deficits in response inhibition) and emotional processes (increased negative emotional processing) linked naturally occurring insufficient sleep with aggression.

Method: Approximately 143 participants between the ages of 18 and 40 were recruited from a larger, grant-funded aggression study. Participants wore Fitbit Flex sleep-tracking devices and kept a sleep diary to monitor sleep duration over a three-day period. Electrophysiological indices of emotional processing and response inhibition (frontocentral P3 and N2) were measured via an Emotional Go/No-Go task, and aggression under provocation was measured using a laboratory aggression paradigm. Mixed-model repeated measure ANOVAs tested the relationships between sleep duration, emotional processing, response inhibition, and aggression, controlling for potential confounds (e.g., substance abuse). Path analyses examined whether emotional processing and response inhibition mediated the sleep-aggression relationship.

Results: Results partially supported our hypotheses. As expected, insufficient sleep was associated with greater intensity of aggression observed in the laboratory. Worse sleep was linked with increased processing of emotionally salient stimuli and impairments in inhibitory control under certain emotional conditions. Results of analyses examining potential mechanisms of the sleep-aggression relationship were surprising.

Discussion: These results provide the first experimental evidence that naturally-occurring insufficient sleep predicts aggressive behavior, and preliminarily suggests that certain cognitive and emotional processing deficits emerge in the presence of poor sleep. Implications of these findings for understanding and preventing aggression will be discussed.

FAMILY INTERVENTION: TELEPHONE TRACKING—CAREGIVER (FITT-C) IMPLEMENTED IN A CLINICAL SETTING: TAKING C.A.R.E.

Erin Burke, BS; Sarah Pillemer; Channing Sofko; Lauren Kenney; Karysa Britton; Geoffrey Tremont

Dementia caregivers are at increased risk for emotional and mental health issues, including burden, depression, reduced functional status, lower life satisfaction, and anxiety, and often do not seek assistance. Although dementia caregiving has been extensively studied, there is a continued need to develop effective strategies to help caregivers manage an individual with dementia. Telephone-delivered interventions have been shown to reduced burden and improve perceived health in dementia caregivers. The current study aimed to translate an empirically-supported telephone-based intervention for family caregivers of individuals with dementia to a real-world clinical setting while examining protective factors against caregiver burden. The Taking C.A.R.E program included three weekly one-hour sessions focused on psychoeducation, problem-solving techniques, and behavioral activation strategies for caregivers. Overall, 37 potential participants were screened and eligible to participate in the study; however, only 14 were able to attend physical sessions due to various barriers. Of the 14 participants, only five completed all three sessions. Common barriers reported included limited access to transportation, inability to find alternate care for their loved ones, limited in-person appointment times, and upcoming surgeries or travel plans scheduled. Those who attended the in-person sessions reported very high satisfaction ratings, suggesting that those who attended all three sessions were satisfied with the program. There was also a trend towards increase in dementia and caregiving knowledge and reductions in depression, burden, and other outcome measures. Overall, results highlight a need for more accessible interventions (e.g., web-based) to reduce many of the barriers that precluded in-person attendance.

IMPAIRED RESPONSE INHIBITION TO SELF-HARM STIMULI INTERACTS WITH NEGATIVE AFFECT AND URGENCY TO PREDICT NONSUICIDAL SELF-INJURY URGES: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY

Taylor Burke, MA, Kenneth Allen, Ph.D., Ryan Carpenter, Ph.D., Marin Kautz, B.A., David Siegel, B.A., Lauren Alloy, Ph.D.

Empirical evidence suggests that those who engage in nonsuicidal self-injury (NSSI) may exhibit deficits in the cognitive control system, specifically in their ability to effectively modulate or inhibit behavioral impulses. However, extant research is mixed regarding whether inhibitory control in response to neutral and negative stimuli are associated with NSSI. In the current study, we investigated whether inhibitory control over responses to self-harm stimuli may more be a more specific risk factor for NSSI. Specifically, we examined if impaired response inhibition to self-harm stimuli interacts with momentary negative affect and momentary urgency (i.e., affect-driven impulsivity), respectively, to predict NSSI urges in real-time. Participants were 63 university students (M = 20 years; SD = 2.05) with a history of repetitive NSSI. At baseline, participants completed an Emotional Stop Signal Task in which they were asked to make fast-paced judgements about the valence (positive or negative) of self-harm images. On a random subset of trials, auditory stop-signal stimuli directed participants to terminate initiated responses; inhibitory control over emotional reactions to self-harm stimuli was operationalized as the proportion of commission errors made during stop trials relative to the total number of stop trials. After completion of baseline procedures, participants subsequently participated in a ten-day ecological momentary assessment protocol in which they completed self-report questionnaires assessing negative affect and urgency three times daily on their personal smartphones. Results of multilevel models suggest that impaired response inhibition to self-harm images did not evidence a main effect on the strength of momentary NSSI urges. However, inhibitory control over emotional responses to self-harm images significantly interacted with momentary negative affect and urgency to predict the strength of NSSI urges in real-time. Plotting revealed that momentary negative affect was positively associated with the strength of NSSI urges, and there was an interaction of negative affect and response inhibition to self-harm stimuli, such that negative affect was more strongly associated with NSSI urge level in participants with poorer response inhibition (b = 0.44, p = .003). Similarly, momentary urgency was positively associated with the strength of NSSI urges, and there was again an interaction with response inhibition to self-harm stimuli, such that urgency was more strongly associated with NSSI urge level in participants with poorer response inhibition (b = 0.59, p < .001). Our findings suggest that trait-level deficits in inhibiting behavioral impulses to self-harm stimuli may increase the strength of NSSI urges during "real-time" negative affective and affect-driven impulsive states. Implications and future research directions will be discussed.

TRAJECTORIES OF CHANGE IN CBT FOR CHILD ANXIETY

Matthew Carper, MA; Anna J. Swan, Ph.D.; Philip C. Kendall, Ph.D., ABPP

Anxiety disorders are highly prevalent among youth, affecting roughly 13% of the youth population. Cognitive behavioral therapy (CBT) has been identified as a empirically-supported treatment for childhood anxiety, typically achieving response rates of 60% in large randomized clinical trials. Most clinical trials use pre, post, follow-up designs, which assume that the process of change is linear. However, it is increasingly recognized that symptom change is not always linear (e.g., Laurenceau et al., 2007; Hayes et al., 2007). Although there has been little research to date examining trajectories of symptom change in CBT for youth anxiety, what has been done suggests that the shape of change may be cubic. The present study aims to replicate and extend the findings of Chu and colleagues (2013) by examining both the shape of symptom change and the predictors of change in CBT for child anxiety.

Participants were 93 youth (ages 7-14; 48% female) diagnosed with an anxiety disorder who obtained treatment as part of a larger RCT (i.e., Kendall et al., 2008). Families included in the present study were randomly assigned to receive individual CBT (ICBT) or family-based CBT (FCBT). During pre- and post-treatment assessments, participants completed a diagnostic interview and self-report measures of anxiety severity and coping skills (among others). After each treatment session, youth and parents completed measures of anxiety severity.

Consistent with Chu et al. (2013), three multilevel growth curve models were fit to weekly symptom data: a linear model with an exposure covariate (representing linear change and allowing for an increase during exposure sessions), a loglinear model with an exposure covariate (representing a quick decrease in symptoms in early sessions with an anxiety "spike" when exposures begin), and a cubic model (representing a decrease in symptoms in early sessions, followed by a short increase during the middle of treatment, and a final decrease at the end of treatment). Model fit was evaluated using deviance statistics, the AIC, and the BIC. Once the best-fitting model was determined, we examined several level-2 predictors of change.

Results revealed the best fitting model was the log-linear model with the exposure covariate. The start of exposure tasks was not associated with an increase in anxiety symptoms (b = 0.23, p > 0.05). There was significant variance in both the intercept and slope of the growth models, suggesting there is significant individual variability in anxiety symptoms at session 1 and in the trajectory of anxiety symptom change over the course of treatment. Higher levels of anxiety severity (b = 2.27, p ≤ 0.01) and depressive symptoms (b = 0.33, p ≤ 0.001) and individuals without comorbid diagnoses (b = -4.23, p ≤ 0.01) had higher STAI-C scores at Session 1. Individuals who received FCBT experienced slower reductions in anxiety symptoms compared to those receiving ICBT (b = 1.17, p < 0.05). Individuals with higher depressive symptoms experienced faster reductions in anxiety symptoms (b = -0.10, p < 0.05).

The results of the present study suggest that the shape of change in CBT for youth anxiety is logarithmic whereby youth experience a period of quick decline in anxiety early in treatment. Results also suggest that individuals with higher levels of depressive and anxiety symptom severity at pretreatment and those without comorbid diagnoses have higher levels of anxiety severity at session 1. Finally, results suggest that FCBT treatment was associated with slower reductions in anxiety symptoms. Moreover, individuals with higher depressive symptoms at pretreatment experienced faster reductions in anxiety symptoms. Significant variance in both the slope and the intercept of the growth curve in the final models suggests there are likely a variety of other factors that contribute to trajectories of change in CBT for youth anxiety.

PREDICTORS OF RESPONSE TO COGNITIVE REMEDIATION OF INDIVIDUALS WITH SCHIZOPHRENIA

Brian Castelluccio, PhD; Kenney, Joshua G.; Johannesen, Jason K.

Meta-analyses report moderate effects across cognitive remediation (CR) trials in schizophrenia. However, individual responses are variable, with some participants showing no appreciable gain in cognitive performance and reasons for heterogeneous outcome undetermined. To address this issue, we ask whether CR outcome is better explained by proximal gains in trained cognitive abilities (near learning), or by individual characteristics unrelated to intervention. Thirty-eight schizophrenia outpatients were classified as responders and non-responders according to change in cognitive composite score following 20 sessions of computer-based training. Baseline demographic, clinical, cognitive, and electroencephalographic (EEG) features were tested along with training progress measures as predictors of outcome. Significant improvement in training task performance and cognitive composite score (Cohen's d=.43) suggested that CR was effective overall, though without direct relationship between training progress and outcome. Responders and non-responders were equivalent on baseline characteristics with two exceptions; responders had significantly higher EEG individual alpha frequency and lower antipsychotic dosing, which together explained 41% of variance in response to intervention. Results suggest that CR outcome in schizophrenia may depend more on individual factors, particularly those influencing cognitive capacity, than on gains in trained ability. Further understanding of factors influencing transfer of learning is needed to optimize benefits of CR.

BEHAVIORAL FEATURES THAT PREDICT MOTIVATED RESPONSE FOR ETHANOL IN DROSOPHILA

Jamie Catalano, BS, Mei N., Azanchi R., Song S., Blackwater T., Mahmud F., Kaun K.R.

Understanding ethanol's complex effects on reward and motivation circuits in the brain is critical for the development of better biologically informed therapies for ethanol abuse and addiction. Recent advances in neurogenetics have highlighted Drosophila melanogaster as an exciting model to study the effects of ethanol at the circuit and single neuron levels. However, methods for assessing motivation for drugs like ethanol are lacking in the Drosophila field. To address this methodological gap, we have developed a runway based operant conditioning assay for investigating the motivational drive for vaporizable stimuli like ethanol. Our results suggest that Drosophila demonstrate both seeking and avoidance behaviors for ethanol in a dose dependent manner. Furthermore, machine learning software provides a high-resolution view of more subtle features of motivated behavior in this model. Future studies will assess the necessity and sufficiency of specific neuronal circuits in ethanol mediated seeking and avoidance. This experimental paradigm for estimating motivational drive will allow for circuit, single neuron, molecular, and genetic analyses of ethanol's motivational effects.

INTER-ALPHA INHIBITOR PROTEINS (IAIPs) BIND TO THE UBIQUITOUS HIGH MOBILITY GROUP BOX-1 (HMGB1) NUCLEAR PROTEINS

Ray Chen, MD, Kiyoshi Teshigawara, Joseph Qiu, Andre R Santoso, Clémence Disdier, Sakura Nakada, Xiaodi Chen, Masahiro Nishibori, Barbara S. Stonestreet, Yow-Pin Lim

Background: HMGB1 is a transcription-regulating protein usually located in the nucleus. However, it exhibits pro-inflammatory cytokine properties when it is translocated and released into the extracellular space. We have previously shown that hypoxic-ischemic (HI) brain injury results in early translocation of HMGB1 into the cytosol and release into the extracellular space in the brain of neonatal rats. IAIPs are endogenous immunomodulatory molecules. We have also shown that IAIPs inhibit pro-inflammatory cytokines and exhibit neuroprotective properties after HI injury in neonatal rat brain. However, the mechanism(s) of action and targets of IAIPs remain to be determined. We hypothesize that IAIPs inhibit inflammation in part by binding to HMGB1.

Objective: To determine the binding between IAIPs and HMGB1.

Design/Methods: Solid-phase binding assays with biotin-labeled reagents and non-labeled reagents on surface plasmon resonance (SPR) were used todetermine the binding potential between IAIPs and HMGB1. Reciprocal experiments were conducted by immobilizing IAIPs on microplate/surface and binding biotinylated and non-labeled HMGB1 in serial dilutions and vice versa bymmobilizing HMGB1 and binding biotinylated and non-labeled IAIPs in serial dilutions. Cellular localization of IAIPs-HMGB1 in the cortex of normal neonatal rat brain was visualized by double labeling with IAIPs and HMGB1 antibodies.

Results: Solid-phase binding assay (Fig. A,B) and SPR (Fig. C,D) showed that there is a specific binding between IAIPs and HMGB1 in vitro. The equilibrium dissociation constants (Kd) for immobilized IAIPs (Fig. A,C) or HMGB1 (Fig. B,D) were 50.35 nM and 206.6 nM, respectively. Nuclear co-localization of IAIPs and HMGB1 was detected (Fig. E) via immunofluorescence staining in normal neonatal rat brains.

Conclusion(s): We demonstrated that IAIPs and HMGB1 bind in vitro and colocalize in vivo in normal neonatal brain. HMGB1 is locally released after HI injury by damaged tissue leading to neuro-inflammation and subsequent neuronal damage. We speculate that in vivo binding of IAIPs to HMGB1 may facilitate the some of the immunomodulatory and neuroprotective properties of IAIPs after HI brain injury in neonates.

ASSESSING GENDER DIFFERENCES IN AUTISM SPECTRUM DISORDER USING THE GENDERED AUTISM BEHAVIORAL SCALE (GABS)

Elaine Clark, BA, Laura Hull, Rachel Loomes, Carolyn McCormick, Stephen Sheinkopf, William Mandy

Background:
Females with autism spectrum disorder (ASD) are diagnosed later than males with ASD (Lai et al., 2015). Some suggest gendered differences in ASD symptomatology, also known as the female autism phenotype, may contribute to delayed diagnoses for females with ASD (Bargiela et al., 2016). Current gold-standard ASD assessment tools were normed in predominantly male samples, and therefore may be inadvertently biased against females. The Gendered Autism Behavioral Scale (GABS) is a coding frame developed at University College London (UCL), measuring hypothesized components of the female autism phenotype, including increased social motivation, decreased externalizing behaviors, and socially-appropriate restricted interests, in recordings of ADOS-2 administrations (Loomes, 2016). Preliminary GABS results have been promising, with females scoring significantly higher than males (Loomes, Hull, Skuse, & Mandy, 2017). This study assessed the feasibility and validity of the GABS in an entirely new sample, the Rhode Island Consortium for Autism Research and Treatment (RI-CART).
Objective:
To assess the inter-rater reliability of the GABS, and replicate pilot findings that the GABS differentiates phenotypic expression of females versus males (all verbally fluent) from video-recorded standardized diagnostic assessments. .
Method:
A UCL researcher involved in piloting the GABS trained a RI-CART researcher to code the GABS. The first RI-CART researcher then trained a second, independent RI-CART researcher. During this second training, instances in which the RI-CART researchers could not reach consensus on a given item were resolved by the UCL researcher.
This study analyzed video recorded administrations of the Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2) from males (n = 40) and females (n = 20) aged 4-59 years enrolled in RI-CART, a state-wide, community-based sample. Participants had community diagnoses of ASD and a positive ADOS-2. Female participants were matched with two male participants of similar age, IQ, and/or Vineland ABC scores.
Results:
Acceptable inter-rater reliability was achieved between the UCL and first RI-CART researcher (k = 0.69) as well as the first and second RI-CART researchers (k = 0.72). Male participants received significantly higher scores than female participants on GABS items C2 (externalizing difficulties) X2 (1, n = 60) = 6.56, p = .010 and D1 (reported interests frequency/intensity) X2 (3, n = 60) = 8.81, p = .032, indicating male participants reported more externalizing symptoms and more intense restricted interests than female participants. However, the difference in overall GABS scores between males (M = 14.52, SD = 5.42) and females (M= 16.38, SD= 5.05) was not significant t(58)= 0.784, p = .076.
Conclusion:
This study found acceptable inter-rater reliability between GABS assessors across UCL and RI-CART. Validity tests resulted in a partial replication of female vs. male differences on the GABS. This lack of differences may be attributable to an overly small and/or heterogeneous sample. Specifically, the current sample had a notably larger age distribution than the GABS pilot sample. The GABS could provide a means of extracting valuable data on the hypothesized female autism phenotype through a widely employed assessment, the ADOS-2. Future research should assess the GABS' reliability and validity in larger samples, and consider additional tests of validity such as differentiating females with ASD and a negative ADOS-2 (i.e., false negatives) from females with concordant ADOS-2 and clinical diagnosis.

UNDERSTANDING THE NATURE OF ASSOCIATIONS BETWEEN FAMILY INSTABILITY, UNSUPPORTIVE PARENTING, AND CHILDREN'S EXTERNALIZING SYMPTOMS

Jesse Coe, PhD, Patrick Davies, Rochelle Hentges, Melissa Sturge-Apple

Family instability, characterized by the cumulative amount of transitions (e.g., caregiver intimate relationship transitions, caregiver changes, residential moves, caregiver income/job loss) experienced by the family, has consistently been identified as a precursor of childhood externalizing symptoms (e.g., Ackerman et al., 1999; Milan et al., 2006). Although the salience of instability as a risk factor for externalizing symptoms is well-established, little is known about the family processes that underpin children's susceptibility. Prior theory and research characterize supportive parents as those that are actively engaged with their child, provide warmth and support, and display synchrony and appropriate sensitivity to their child's needs and developmental stage (e.g., Bornstein, 1989). Conceptual models of parenting stress have proposed that the strain of experiencing family instability may manifest in parents' subsequent difficulties in providing support to their child during situations that involve challenge, guided learning, and cooperation (e.g., Belsky, 1984; Belsky et al., 2012; Osborne & McLanahan, 2007). Consequently, the disconnect between parents and their children may account for risks associated with instability for children. The present study represents the first definitive test of a more proximal family process (i.e., unsupportive parenting) as a mediating mechanism in the predictive pathway between family instability and children's externalizing symptoms during the transition into the early school years. To achieve a more definitive understanding of the nature of associations between the primary variables in our study, we also tested the utility of complementary pathways, including (a) a "child-driven" model proposing that children's externalizing symptoms serve as precursors to subsequent unsupportive parenting and family instability and (b) potential bidirectional transactions between family instability, unsupportive parenting, and child externalizing symptoms.

Participants in this longitudinal (three annual measurement occasions) project included 243 racially diverse (48% Black) 4-year-old children, their parents, and classroom teachers. At all three time-points, mothers reported on the number of transitions experienced by the family in the previous year, maternal parenting behaviors were observationally rated during a family interaction task, and teachers completed scales assessing children's externalizing symptoms.

Results of cross-lagged autoregressive SEM tests indicated that, as hypothesized, higher levels of family instability at Wave 1 predicted decreases in supportive parenting from Wave 1 to Wave 2, which, in turn predicted increases in externalizing symptoms from Wave 2 to Wave 3. Tests in RMediation (Tofighi & MacKinnon, 2001) indicated that this indirect pathway was significantly different from zero, 95% CI [.002, .075]. Analyses also revealed a bidirectional relationship between parenting and family instability over time, such that higher levels of instability predicted decreases in supportive parenting, which, in turn predicted increases in family instability (significant indirect effect, 95% CI [.004, .061]). Results were robust even in the context of sociodemographic covariates. Findings will be discussed in relation to models of parenting stress (e.g., Belsky, 1984; Fomby & Cherlin, 2007; Osborne & McLanahan, 2007), family spillover (e.g., Bolger et al., 1989; Erel & Burman, 1995), and their theoretical and practical implications for understanding children's adaptation in family contexts.

HIGH RATES OF MENTHOL CIGARETTE USE AMONG PREGNANT SMOKERS: PRELIMINARY FINDINGS

Alana Corey, BA, Samantha Goldman

Background: Menthol is a flavor used in cigarettes that contributes to changes in taste and sensory effects of smoking. Specifically, the mint taste may mask aversive flavors of tobacco, and the soothing/cooling properties are believed to reduce the harshness and irritation of nicotine in cigarettes. Approximately one third of smokers endorse use of menthol cigarettes, with even higher rates among women and vulnerable populations, including racial and ethnic minorities, and underserved populations. Use of menthol cigarettes has been associated with increased likelihood of smoking initiation, increased nicotine dependence, and reduced smoking cessation in some studies. However, despite these associations, little is known regarding use of menthol cigarettes in pregnant women, a highly vulnerable population given known health risks for mother and infant from continued smoking during pregnancy.

Method: Participants were drawn from two racially/ethnically diverse cohorts of pregnant smokers recruited between 2006 and 2015 (N=166, Mage=25, SD=5; 58% racial/ethnic minorities). Prospective structured interviews over gestation included: (a) menthol vs non-menthol cigarette use, (b) average cigarettes per day for each week of pregnancy (based on Timeline Followback interviews), (c) sustained quitting vs persistent smoking, (d) number of weeks abstinent, and demographics. The Fagerstrom Test of Nicotine Dependence was also administered. Nicotine exposure was assessed via saliva cotinine and cotinine/cigarette per day.

Results: High rates of menthol use were found in both cohorts (84% and 89% of pregnant smokers) with highest rates among racial/ethnic minorities, less educated ($\leq$ high school), and low-income smokers (annual household income $\leq$ \$30,000). Further, statistical trends emerged in which relative to non-menthol smokers, menthol cigarette smokers were less likely to quit smoking (29% vs 48% quit; p= .08), and were abstinent fewer weeks of pregnancy, (13$\square$15 vs 20$\square$16), t(109) = 1.76, p= .08; d = 0.45), but did not differ in cigarettes per day, nicotine dependence or nicotine exposure.

Conclusions: To our knowledge, only three prior studies reported rates on menthol use in pregnant smokers; two studies in southern states showed rates of 50% menthol cigarette use, and one Northeast study showed 81% menthol use. We found very high rates of menthol cigarette use in two Northeast cohorts of pregnant smokers, with some variability by race/ethnicity and socioeconomic status. We also observed associations between use of menthol cigarette use and failure to quit smoking during pregnancy. Given known neonatal morbidity and mortality following exposure to maternal smoking, consideration of low-resource pregnant women and their offspring as a unique vulnerable population is warranted in evaluating regulation of menthol in cigarettes.

EFFECTS OF SLEEP QUALITY AND PAIN INTENSITY ON NEGATIVE AFFECT IN IDIOPATHIC PARKINSON'S DISEASE

Earl Crew, PhD, Catherine Price, Michael Robinson

Introduction: Parkinson's disease (PD) is clinically characterized by chronic, progressive impairments in motor and non-motor functioning. The non-motor symptoms (NMSs) of PD include mood disturbances, sleep difficulties, and chronic pain. Dopaminergic cell loss plays a large role in explaining the prevalence of affective disorders in PD, as symptoms of anxiety and depression are highly responsive to antiparkinsonian medications. However, mood difficulties often persist in PD patients on dopamine therapy, suggesting other contributing factors aside from neurodegeneration. This study examined the extent to which other NMSs of PD, specifically sleep and pain, may contribute to negative affect among patients with PD.

Methods: 20 patients with idiopathic PD (age=67.8±6.1) and 19 age-matched controls (age=69.7±6.5) completed bi-daily (morning and evening) surveys for 14 days to collect average ratings of their nightly sleep quality (SQR; 1=Very Poor Sleep; 5=Very Good Sleep), daily pain intensity (0-100 Visual Analog Scale, 100=Worst Pain Sensation Imaginable), and daily negative affect (NA; measured by the PANAS-SF; 1=never, 5=always; range= 5-25). PD-related variables including motor symptom severity (UPDRS Part III) and intensity of antiparkinsonian medication (levodopa-equivalent dosage or LED) were also collected. Hierarchical regression was performed predicting NA scores (higher=more NA) with the following steps: Step 1: UPDRS Part III and LED; Step 2: SQR; Step 3: Pain Intensity.

Results: The model showed that NA ratings were related to our PD variables (Step 1: R^2=.232), while adding SQR in Step 2 (R^2=.317) improved model fit and uniquely predicted NA (β= -0.335). In the final Step 3 model (R^2=.600, $p<.001$), SQR (β= -0.317) and pain intensity (β= 0.589) were both uniquely associated with NA after adjusting for other PD-related variables.

Conclusion: Poorer subjective sleep quality and higher self-reported pain were associated with negative affect independent of motor symptom severity or intensity of antiparkinsonian medication in patients with PD. The symptoms underlying poorer sleep quality and higher pain intensity in PD patients warrants further study. Modifiable aspects of sleep and pain in PD could be targeted in intervention studies to improve patient outcomes.

DO FACETS OF MINDFULNESS AND EMOTION REGULATION SKILLS MODERATE THE ASSOCIATION BETWEEN EMOTIONAL EATING AND DEPRESSION SEVERITY IN BARIATRIC SURGERY CANDIDATES?

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Emotional eating is common in bariatric surgery candidates and may be associated with poorer surgical outcomes. Emotional eating also may be particularly common among surgery candidates reporting depression symptoms. However, the mechanisms linking depression and emotional eating are unclear. The goal of this study was to examine whether mindfulness and emotion regulation skills moderate the relationship between emotional eating and depression severity in bariatric surgery candidates. Bariatric surgery candidates (n=1,088) were referred by their surgeons for a comprehensive psychiatric presurgical evaluation, including a semi-structured diagnostic interview and self-report questionnaires. Hierarchical linear regressions were utilized to examine the potential moderation effects of mindfulness and emotion regulation. Results showed that only the observing mindfulness facet by depression severity interaction was significantly associated with emotional eating in the final regression analysis examining the relative effects of each mindfulness facet and facet by depression interaction. Closer examination of results indicated that greater severity of depression was associated with a greater likelihood of reporting emotional eating when observing was high. With respect to emotion regulation, the strategies subscale by depression severity interaction was significantly associated with emotional eating in the initial regression analyses, but it was no longer significant relative to all other emotion regulation subscales in a final regression analysis. Overall, results suggest that the observing facet of mindfulness may be particularly relevant to the relationship between depression severity and emotional eating, especially with respect to the quality of observing experiences. In other words, it is possible that surgery candidates who focus on their symptoms in a judgmental manner, rather than observing them nonjudgmentally, may be prone to emotional eating. Future research should recruit a more diverse sample, employ a longitudinal design, and examine other variables that may moderate or mediate the relationship between emotional eating and depression.

ASSOCIATIONS OF CHILDHOOD PARENTAL LOSS AND MALTREATMENT WITH METABOLIC RISK IN HEALTHY ADULTS

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Background:
Childhood trauma and adversity are major risk factors for psychiatric disorders and medical conditions, including obesity, cardiovascular disease, diabetes, fibromyalgia and chronic fatigue. The association of early life stress with adverse health outcomes may be driven in part by changes to metabolic and inflammatory processes resulting from early environmental exposures. In particular, childhood stress may confer risk through chronic, progressive dysregulation of physiologic processes on the cellular and molecular level that leads to systemic dysfunction and disease over the course of one's life. However, current research is limited by small sample sizes, limited data regarding early life experiences and is often confounded by effects of other illnesses or medications. Childhood parental loss is a discrete and objective stressor, which allows for investigation of its associated psychiatric and medical sequelae. This study examined early life stress, psychiatric and physical symptoms, and measures of current health in a sample of young adults with and without childhood parental loss and maltreatment.

Methods:
Individuals 18-40 years-old (N=124) were recruited via social media and community advertisements, eligibility assessed via phone interview. Cases (N= 60) experienced parental loss before age 11 and childhood abuse or neglect. Controls (N=64) had no parental loss, childhood trauma or psychiatric history. Standardized interview and self-report measures assessed demographics, past medical history, and health behaviors. Participants had no acute or chronic medical conditions, current medications other than oral contraceptives, primary psychotic or bipolar disorder or OCD. Self-reports were administered to evaluate childhood adversity (loss, physical, emotional, sexual, neglect) and recent psychiatric and physical symptoms. Fasting blood samples were drawn for laboratory assessments of metabolic processes including hemoglobin A1C (HgbA1C), cholesterol and triglycerides.

Results:
After controlling for age and sex, parental loss and childhood maltreatment were significant positive predictors of HgbA1C and white blood cell concentration ($p<.05$), and negative predictors of high density lipoprotein cholesterol (HDL; $p<.05$). Recent perceived stress and adult stressors were not associated with any of the metabolic laboratory tests. Individuals with current or lifetime stress/trauma related psychiatric disorders or lifetime anxiety disorder had lower levels of HDL ($p<.05$), after controlling for age and sex. Those with a current stress/trauma related disorder also had higher HgbA1c levels ($p<.05$). Some of the associations of childhood adversity with metabolic processes remained after controlling for lifetime stress/trauma disorders.

Conclusion:
These findings demonstrate the importance of early life stress, including parental loss and maltreatment, as a risk factor for future metabolic and cardiovascular illness. Both cases and controls in this study are characterized as physically healthy young adults, without medical comorbidities or medications. Thus, the association of parental loss and childhood maltreatment with metabolic measures may be more clearly identified without the influence of these common confounders. Further, the metabolic changes were not associated with current perceived stress or recent stressors. The pre-morbid associations of early stress with metabolic change presented here suggest a risk process that may underlie poor downstream health outcomes in individuals exposed to early adversity. Further investigation will include assessments of resilience and social support.

MATERNAL DIET, PLACENTAL LEPTIN METHYLATION, AND INFANT GROWTH

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Background: High and low birthweight, as well as early gestational age, increase risk for a variety of medical and psychiatric conditions. Several factors influence birthweight and gestational age; preclinical and clinical studies show that maternal diet is an important factor. Leptin is a hormone that regulates satiety, body weight, and reproductive and developmental functions, and may be involved in the association between maternal nutrition, maternal obesity and infant outcomes. DNA methylation of placenta genes, such as leptin, may occur in response to exposures and may program subsequent infant development. This study examined maternal diet, placenta leptin gene DNA methylation, and neonatal growth in a sample of healthy neonates and their mothers.
Methods: Healthy neonates and their mothers (N=135) were recruited within 1-2 days following delivery at Women and Infants Hospital in Providence, RI.
A structured interview was conducted to assess the weekly servings of various types of food consumed by the mothers. Maternal pre-pregnancy weight, pregnancy weight gain, infant birth weight, maternal health, medications, and vitamin use were obtained from medical records. Bisulfite pyrosequencing was used to measure methylation of CpG sites in the promoter region of the leptin gene in placenta and genotype the leptin single nucleotide polymorphism (SNP) rs2167270.
Results: Genotype was a significant predictor of leptin DNA methylation ($p<.05$), and after controlling for this and demographic and weight-related covariates, lower levels of leptin methylation were significantly associated with higher intake of sugared drinks ($p<.05$), white carbohydrates ($p<.05$), and whole grain carbohydrates ($p<.05$). Lower levels of leptin methylation were associated with smaller infant head circumference ($p< .05$), but not significantly associated with birthweight ($p= .11$) or gestational age at birth.
Conclusion: These findings show the importance of intake of sugar and carbohydrate consumption for methylation of the placental leptin gene. Because methylation reduces gene transcription, lower methylation may indicate a placental response to high carbohydrate food that would result in higher levels of this satiety/metabolic hormone during fetal development. Lower levels of methylation (which are expected to lead to higher levels of the hormone) were also linked to smaller head circumference, suggesting the possibility that higher placenta leptin concentration may have important effects on growth and brain development.

ADVERSE LIFE EVENTS AND DISORDERED EATING BEHAVIORS: THE MEDIATING ROLE OF DEPRESSIVE SYMPTOMS FOR ADOLESCENTS WITH SEVERE OBESITY

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Objective
Stress and adverse experiences in adolescence have been associated with increased disordered eating patterns and increased rates of overweight and obesity. Depressive symptoms are associated with adolescent weight status and has been identified as a mediator of the association between negative experiences and disordered eating patterns in adulthood. However, this association has not been examined within adolescence. The goal of the present study is to examine whether the association between adverse events and disordered eating patterns is mediated by depressive symptoms. Given the relationship between experience of stressful events and severe obesity, the current study also aims to examine this association in adolescents with obesity and those with severe obesity separately.

Method
Participants were 101 adolescents (M age=14.69, SD=1.94; M BMI=39.48, SD=8.93) enrolled in a hospital-based weight management program. Both objective height and weight were measured and used to calculate adolescent BMI (body mass index) and categorize level of obesity. Obesity is defined as at or above the 95th percentile of BMI for age and gender. Severe obesity is defined as 120% of the 95th percentile for BMI. Adolescents reported on their disordered eating behaviors including restraint, as well as eating, weight, and shape concern (Eating Disorder Examination Questionnaire; EDEQ), depressive symptoms (Reynolds Adolescent Depression Scale; RADS) and stressful life events (Adolescent Life Change Event Scale; ALCES). Mediation analyses were conducted using the PROCESS macro for SPSS and employing bootstrapping. Confidence intervals that do not contain zero are significant.

Results
No significant differences were found between individuals with obesity (N=72) and those with severe obesity (N=29) on adverse experiences, depressive symptoms, or disordered eating behaviors. The overall mediation model was significant, $F(2, 98)=8.72$, $p<.01$, explaining 15.11% of the variance in disordered eating patterns, with a significant indirect (mediational) effect of depressive symptoms (CI = .001 - .005). This association held true for adolescents with severe obesity, $F(2, 69)=3.91$, $p<.05$ ($R2=.102$), but was not significant for adolescents with obesity.

Conclusion
Depressive symptoms mediate the association between stressful life events and disordered eating patterns, especially in adolescents with severe obesity. This may be due to impairment experienced by adolescents with severe obesity in many aspects of their lives, potentially leading them to be at heightened risk for the negative impacts of adverse life events. As adverse events may be unavoidable, depressive symptoms provide a vital opportunity to intervene on this pathway.

NATURALISTIC SLEEP PATTERNS ACROSS 12 WEEKS REFLECT ADHD SYMPTOMATOLOGY IN CHILDREN

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Introduction: In children, attention-deficit/hyperactivity disorder (ADHD) has been associated with poor sleep, yet few studies have objectively measured sleep patterns in this population. Our goal was to test the hypothesis that reduced sleep regularity indexes ADHD symptoms in children.

Methods: The sleep-wake patterns of thirteen middle-school students (8F; 12.6±0.7 years; varying in ADHD severity) were monitored for twelve weeks using wrist-worn actigraphy and daily diaries. ADHD symptoms were assessed at the beginning of the recording period using Conners-3 rating scales completed by teachers and parents. Sleep variables of interest (duration, timing, regularity) were calculated from actigraphy. Regularity was assessed through the Sleep Regularity Index, a 24-hour autoregressive prediction of sleep-wake scores. Multiple regression analyses assessed associations between sleep outcomes and ADHD symptoms, controlling for gender and age.

Results: Our sample captured a broad range of ADHD severity (hyperactivity T-scores: [teacher range=43-90; median=60.0±14.0]; [parent range = 39-85; median=57.0±12.9]). More irregular sleep was associated with higher teacher-rated hyperactivity (b=-0.0025; t=-2.54; p=.032; $\eta2$=0.46). Unlike teacher ratings, no associations were found with parental report (b=-0.0024; t=-1.05; p=.321; $\eta2$=0.17). Regardless of reporter, no significant associations (all p's>.05) were present between symptoms and other sleep variables of interest: duration (i.e., total sleep time) and timing (i.e., bedtime, sleep midpoint).

Conclusion: These data indicate sleep regularity as a potential novel index of ADHD severity. More irregular sleep across the 12-week interval was associated with more hyperactive and impulsive behaviors in youth, as rated by their classroom teachers. This effect was specific to sleep regularity, with variables pertaining to sleep length or timing not associated with symptoms. The effect's specificity to teacher report may reflect the unique on-task behaviors present in the classroom, underscoring the importance of considering multiple reporters when assessing youth. Finally, whether heightened hyperactivity is driving more erratic sleep, or whether poor sleep is leading to hyperactive behavior cannot be determined from these cross-sectional analyses. Ongoing data collection with longitudinal measurements of behavior and brain function may better untangle the directionality of these relationships.

ARE KINEMATIC & DYNAMIC PREDICTIONS EMBEDDED IN PERCEPTION?

Abdul Deeb, BA, Fulvio Domini

Understanding and making predictions about the physical properties of objects could greatly facilitate perception and action. For example, simple tasks such as catching a ball or riding a bike require accurate real-time judgments about the behaviour of moving objects. To be optimal, these judgments should be consistent with the physical laws that govern object motion, but previous studies show that beliefs often violate Newtonian laws. However, since all previous studies on this topic have focused on high-level cognitive judgments, the relationship between Newtonian mechanics and the automatic processes of visual perception and action remain entirely unexplored. The proposed research plan aims to test the hypothesis that the sensorimotor system generates predictions consistent with Newtonian mechanics (i.e., "Newtonian priors") to disambiguate noisy sensory information about object motion. We propose that uncertainty in motion perception is reduced by optimal combination of sensory information with internally generated Newtonian predictions. We recently found that when the displayed kinematic properties of a collision event were inconsistent with physics, judgments were biased toward the Newtonian trajectory. This effect was strongest at oblique movement angles and shorter display durations, that is, when sensory noise was greatest. This is consistent with optimal Bayesian combination of sensory information and a noisy Newtonian prior. Our current research attempts to expand these findings to the realm of dynamics and to determine if the visual system exploits Newtonian laws of motion to predict projectile acceleration. When a horizontally launched ball rolls off a surface, its trajectory is determined by the horizontal velocity at the time of descent and gravity. Using the same methodology as in our preliminary experiment with kinematics, we have tested the visual system's ability to use predictions about an event's dynamic properties to reduce uncertainty in sensory motion information. Participants viewed a marble-sized ball fall from a small tabletop under different combinations of horizontal velocity and downward acceleration (one matching Earth's gravity and spanning the range from Mercury's gravity to Jupiter's gravity). On each trial, participants indicated the perceived trajectory of the falling ball by indicating where they saw the ball to fall. Interestingly, dynamical laws are not as deeply imbedded into visual processing as kinematic laws. Participants' internal predictions were biased to underestimate the true gravity of Earth (which may serve a practical role for guiding interceptive actions). However, like in our previous study, perceptual judgments reflected a combination of this prediction with the available visual information. Furthermore, the combination process appears to be consistent with maximum likelihood estimation, as the influence of the internal prediction increased proportionally with the amount of sensory noise, which we varied by manipulating the amount of time the ball's descent was visible.

EARLY LIFE ADVERSITY IMPACTS DEVELOPMENT IN A SEX- AND EXPERIENCE- SPECIFIC MANNER

Camila Demaestri, BS, Madalyn Critz, Tracy Pan, Kevin Bath

Exposure to early life adversity (ELA) dramatically increases the risk for developing psychiatric disorders such as anxiety and depression and is associated with poorer health outcomes. When chronic and severe, ELA can affect homeostatic mechanisms, including the immune system, hormonal systems, and brain development. Additionally, females are most vulnerable to ELA and are twice as likely to develop depression and post-traumatic stress disorder. Recent research has suggested at a sex-specific distinction, namely, that females are more susceptible to adversity at the neurological, behavioral, and hormonal level; and yet, the mechanisms underlying this risk is largely unknown. Another gap in the literature is discussion of how type and severity of ELA influences outcomes. ELA can come in many forms, including growing up in extreme poverty, being physically abused, or experiencing parental neglect. Consequently, brain and behavioral development may be highly sensitive to the specific form that adversity takes. Understanding the unique consequences of different types of ELA on neuronal and behavioral phenotypes is critical for identifying sex-specific risk factors and informing appropriate timing and type of intervention.

Studies in humans pose significant limitations, making it difficult to isolate the impact of different forms of ELA, timing of these effects, and genetic risk on development. However, rodent models of ELA allow for systematic manipulation of environmental variables to better understand the mechanistic underpinnings of risk and vulnerability, while controlling for effects such as genetic background and experiences.

The focus of my project is to compare two mouse models of ELA that reflect different forms of adversity that hold relevance for the human condition. Specifically, I am investigating the contribution of fragmented maternal care and repeated maternal separation on brain maturation and vulnerability to pathology. The former parallels children growing up with limited access to resources and high parental stress (such as instances of extreme poverty or refugee settings), and the latter is comparable to children who grow up with parental neglect or separation (such as those in foster care settings and orphanages). Thus far, my results have identified sex-specific effects of these forms of ELA on the timing of motor coordination, sensory development and weight gain. Moreover, being raised with limited resources reduces weight gain, while maternal separation does not; interestingly, these effects are specific to males. In addition, motor reflexes are delayed following both forms of adversity, with females reared with limited resources being less affected. Females show delayed sensory development, indexed by timing of eye openings, in response to either form of adversity while males show delayed eye opening specifically following limited resource rearing. I hypothesize that analysis of genetic markers for neuronal development and maturation will show similar sex- and adversity-specific results. Together, these results demonstrate that mice who were subjected to stress fail to meet typical developmental milestones and that the type of experience has differential consequences on males and females.

Through the use of a controlled rodent model this work advances our understanding of what developmental mechanisms are impacted in response to ELA and the contribution of each to health outcomes. Such findings may reveal targets for earlier medical and therapeutic interventions or identify genetic biomarkers of risk/resilience and provide critical groundwork for individualized medicine.

A SYSTEMATIC REVIEW OF MINDFULNESS-BASED INTERVENTIONS IN THE UNITED STATES: TO WHAT EXTENT ARE RACIAL/ETHNIC MINORITIES INCLUDED?

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Learning objective:
1.   Describe racial/ethnic representation in Mindfulness-Based Interventions (MBIs) in the United States.
2.   Evaluate the evidence for generalizability to racial/ethnic minorities.

Background: Over the past 30 years, research on mindfulness-based interventions (MBI) has risen in popularity. Many of these studies provide strong evidence of the efficacy of these interventions on numerous health conditions, particularly those that disproportionately affect racial/ethnic minority populations (eg., coronary heart disease). Given the scope of health disparities in the United States, such interventions have the potential to be of great benefit to these populations, however, it is unclear if existing MBIs have targeted or included racial/ethnic minorities. For this reason, this systematic review summarizes the sample, methods, and outcomes of studies evaluating MBI for the improvement a wide range of health-related conditions.

Methods: Using an a priori methodological systematic review protocol, we searched PubMed (additional databases in-progress) for relevant studies published from 1980-2019. Study designs included any evaluation utilizing a comparison group: randomized control designs, quasi-randomized control designs, and non-randomized control designs. Studies must have been conducted in the US (including territories) and published in English.

Results: The search generated 2777 non-duplicate articles. Preliminary screening examined 36 articles, identifying 16 potentially relevant articles for full-text review. Of the 16, a total of 8 articles met inclusion criteria. Four articles did not report the race/ethnicity of the participants. The remaining four articles included small sub-samples of African-Americans (3), Hispanics (1) and "Other Races" (1).

Conclusions: Race/ethnicity is underreported in MBIs. Studies reporting the racial/ethnic identification of participants reveal that African-American, Latinx, and Hispanic populations are under-represented. These findings suggest that current research does not accurately describe potential effects of these interventions in these populations.

SELF- AND CAREGIVER ILLNESS BELIEFS IN AN ADOLESCENT EATING DISORDER SAMPLE

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Introduction: Eating disorders are severe psychiatric illnesses that are associated with high rates of morbidity and mortality. Illness beliefs can be seen as personal beliefs and expectations surrounding a medical or psychological illness. These beliefs can be related to the degree to which the illness affects daily functioning, the interaction between stress and illness symptoms, and emotional responses to illness management. Understanding illness perceptions in adolescents with eating disorders and their families may facilitate development of accurate and mobilizing beliefs, which in turn may support early response to treatment and long-term recovery. The Hasbro Children's Partial Hospital Program (HCPHP) team developed the Illness Beliefs Questionnaire (IBQ) to assess individuals' beliefs about the nature of their own and or/another's illness, and to facilitate family-centered assessment and treatment of chronic pediatric illness, including eating disorders. The primary objective of the present study was to evaluate the psychometric properties of the IBQ among adolescents with eating disorders and their caregivers, including concordance between adolescent and caregiver reports, and associations between IBQ scores and other measures of eating disorder severity.

Hypotheses: Due to the tendency for individuals with eating disorders to minimize the severity of their symptoms, we predicted that there would be low parent/child concordance on the IBQ. We further predicted that more negative caregiver illness perceptions would be associated with greater adolescent illness severity, as reflected in higher eating-related and general psychopathology at admission. In addition, we predicted that more negative caregiver illness perceptions would be associated with longer duration of treatment, and slower weight gain trajectory. Given the ego syntonic nature of eating disorders, which often manifests in minimization of symptoms, we predicted that caregivers' perceptions of the adolescent's illness would be more strongly correlated with adolescent illness severity than the adolescent's own perceptions of their illness. Participants: We assessed families receiving treatment at HCPHP. HCPHP utilizes a family systems model of care, which views families as integral to recovery. We included individuals who met diagnostic criteria for an eating disorder, were between ages 13-18, and engaged in treatment with at least one of their caregivers. Measures: At admission, parent and adolescent perceptions of the adolescent's illness were assessed using the IBQ. Adolescent eating disorder psychopathology was measured via the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994). Comorbid psychopathology was assessed via the Screen for Child Anxiety-Related Disorders (Birmaher, Brent, & Chiappetta, 1999) and the Children's Depression Inventory (Kovacs, 2011). Additional medical markers of the child's eating disorder severity obtained from the patient's medical record, included percent of goal treatment weight at intake and discharge, and length of stay. Analytic strategy: To evaluate the relationship between parent-child illness beliefs, Pearson's Correlations will be calculated. Correlations will also be calculated between parent IBQ scores as well as child IBQ scores and the following variables: patient's eating disorder symptoms, anxiety and depressive symptoms, and treatment outcomes. Fisher's Transformation of r to Z scores will allow for direct comparison of the relative strength of the relationships between Parent and Child scores with symptoms at the start of treatment and treatment outcome. Results: Results will be presented and interpreted, with a focus on the clinical utility of assessing illness beliefs via the IBQ in families in which there is an adolescent with an eating disorder. We will also discuss whether illness beliefs may be a useful prognostic indicator of adolescent eating disorder severity and outcome.

TELEPHONE-DELIVERED INTERVENTIONS FOR PEOPLE LIVING WITH HIV: PERCEIVED BENEFITS AND CHALLENGES

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Objective: This qualitative analysis used semi-structured interviews with study participants and feedback from interventionists to explore the advantages and challenges of telephone-delivered interventions for persons living with HIV (PLWH).

Methods: Interviews were conducted as part of a study comparing the feasibility of two telephone-delivered interventions: mindfulness training (MT) and health education (HE). Participants in both conditions received eight weekly 30-minute phone sessions and were interviewed post-intervention and at 3-month follow up. Interventionists were interviewed at the end of the study regarding their experience with phone delivery and intervention content.

Results: Interviewed patients (n=42; M age = 46 years, 50% female, 26% Black) identified several advantages of phone-delivered sessions. For example, they appreciated being able to schedule (and reschedule) intervention phone calls more flexibly than in-person appointments. Further, participants acknowledged that missing or canceling telephone appointments was more socially acceptable compared to in-person appointments. Participants reported satisfaction with texting for scheduling and reminder calls. Participants described developing meaningful relationships with interventionists. Although problems with phone connectivity did emerge (e.g., lack of minutes at the end of months, poor reception), such problems were effectively solved (e.g., borrowing a phone). Nearly half (43%) of the participants completed 7 or 8 phone sessions, 21% completed 4 to 6 sessions, and 26% completed 3 sessions or fewer sessions. Comparison across the three groups revealed (1) the lowest tertile of call completers reported problems with scheduling and a general dislike of phone conversations; (2) the middle tertile of call completers described the calls as "a little lengthy" and preferred shorter calls; and (3) the highest tertile of call completers noted that rescheduling was "seamless" and reported that they formed a bond with the interventionists. According to four interventionists, flexibility and ability to deliver intervention while traveling or on weekends were keys to intervention completion, despite the additional time and effort required.

Conclusion: For PLWH, telephone delivery of mindfulness training and health education coaching allows patients with uncertain and stressful lives to participate in these interventions.

A PRELIMINARY INVESTIGATION OF WOMEN'S SELF-REPORTED REASONS FOR PRENATAL CANNABIS USE AND MOTIVES FOR DISCONTINUATION

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Background: Prenatal marijuana use has increased substantially in recent years, with epidemiologic data suggesting rates of use increased 62% between 2002-2014. Changes in legalization may lead to greater access to cannabis, as well as a perception of lower prenatal risk. Although rising rates of prenatal use have been documented, little is known regarding reasons why women use cannabis during pregnancy, and the extent to which it is used to address common pregnancy-related discomforts (e.g., nausea) or psychological symptoms (e.g., anxiety, depression). Given that pregnant women are often reticent to treat psychological symptoms pharmacologically, anxiety and depression may represent common reasons for use. In addition, among women who used cannabis prior to pregnancy, but discontinued during pregnancy, little is known regarding women's motives for, and process of, cannabis cessation.

Methods: We assessed pregnant women (gestation 12-26 weeks) regarding self-reported cannabis use prior to and during the pregnancy, as well as reasons for use. Participants could endorse multiple reasons for use, including social/ recreational, symptom relief (pain, nausea, depression, anxiety, etc.), as well as promotion of sleep, relaxation, or avoiding use of other substances. A subset of women who discontinued cannabis during pregnancy also participated in a brief qualitative interview regarding their motivation for and process of discontinuation. Women completed the PHQ-9 depression scale. Participants included pregnant women seeking enrollment in two randomized clinical trials testing prenatal wellness interventions.

Results: Over a 9-month period, 239 pregnant women (mean age=29) completed a full phone screening; of these, 59 (25%) reported regular use of cannabis in the 6 months prior to pregnancy. Women noted a wide range of reasons for using cannabis. The most common reasons for use in the 6 months prior to pregnancy included relieving anxiety, social/recreational use, reducing pain, improving sleep, relaxation , lowering depression, and addressing appetite disturbance. Though many women reported discontinuation when they became pregnant, 34% of cannabis users (8.4% of all women screened) reported continued use throughout pregnancy. The majority of these women reported using cannabis prenatally to treat some type of physical or psychological symptom, most commonly anxiety, nausea, pain, appetite disturbance, and depression; however, 25% of prenatal users also endorsed social/ recreational use. Depressive symptoms were in the moderate range among prenatal cannabis users (PHQ9 mean=11.6). A preliminary analysis of qualitative comments, among a subset of pregnant women who discontinued use, revealed that the process of cannabis cessation is often promoted by concerns regarding safety for the fetus; while some women were able to discontinue use easily, others experienced ongoing difficulty and urges to use, related both to social cues as well as challenges coping with symptoms such as anxiety.

Conclusion: Although limited by use of self-report, findings provide an initial picture of why pregnant women use cannabis. Anxiety and social and recreational use were the most the most common pre-pregnancy reason, and anxiety, nausea and pain were the most common reasons during pregnancy. Further research is needed to more fully elucidate reasons for prenatal cannabis use, as well as risk perceptions, and intention and motives for discontinuation.

LATENT SYMPTOM CHANGE TRAJECTORIES DURING RESIDENTIAL EATING DISORDER TREATMENT & IMPACT ON RISK FOR EARLY RELAPSE

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BACKGROUND/AIMS: Significant heterogeneity in treatment outcomes exists among patients with eating disorders (EDs). Prior research has identified three latent trajectory classes of symptom change during residential ED treatment: Typical Responders (TR), Rapid Responders (RR), and Low-Symptom/Non-Responders (LS; patients are low-weight at admission and report low psychological distress that is stable throughout treatment). This study examined how membership in these three groups related to longer-term outcome at six-month follow-up (6MFU).

METHOD: Female residential ED patients (N=371) completed a symptom assessment battery at admission & discharge; 69% of patients (n=257) were retained at 6MFU. Symptoms assessed included global ED psychopathology, past-month binge eating and self-induced vomiting frequency, and body mass index (BMI). An abbreviated weekly symptom assessment was also administered throughout treatment, from which latent trajectory classes (TR, RR, LS) were drawn. ANCOVA (controlling for baseline severity) and post-hoc pairwise group comparisons (Tukey's HSD) assessed differences among the three latent groups on measures of clinical ED severity at 6MFU.

RESULTS: From admission to 6MFU, patients in all groups experienced significant reductions in global ED psychopathology (p<.0001). At 6MFU, a small proportion of patients (11.9%) met full ED symptom remission criteria, 22.2% achieved partial remission, and 65.8% had relapsed to full-syndrome symptoms. Overall remission rates differed significantly across groups ($\chi2(2)$=6.92, p=.03): Low Symptom patients had a greater frequency of partial or full remission (p=.02), and a larger proportion of Typical Response patients relapsed (p=.02). Results from examination of post-discharge ED symptom deterioration indicated that RR patients had significantly greater increases in symptom severity after discharge than did the RR or TR groups (overall F(2,239)=6.57, p<.0001; ps<.04 for respective pairwise comparisons). A main effect of group on binge eating outcome was detected (F(2,117)=3.24, p=.04), which was primarily driven by a marginal difference between the TR and LS groups (p=.07). No differences in BMI (p=.81) or vomiting frequency (p=.91) emerged across groups at 6MFU.

CONCLUSIONS: Homogeneous subgroups of patients receiving residential ED treatment experience markedly different change trajectories during treatment which are differentially associated with symptom outcomes follow discharge. Future research may explore ways to improve long-term maintenance of symptom improvements for these patient subgroups.

EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION ON AVOIDANCE-BASED REVERSAL LEARNING

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Background: Avoidance of anxiety-provoking situations plays a central role in the maintenance of anxiety and fear-based disorders, such as obsessive-compulsive disorder and posttraumatic stress disorder. Extinction of avoidance behaviors is essential for success of exposure-based psychotherapy, a first-line treatment for anxiety- and fear-based disorders. However, while initial fear acquisition and instrumental avoidance generalize easily across contexts, subsequent extinction of avoidance is context-bound and does not readily generalize to novel contexts. Rodent and human studies point towards the importance of the prefrontal cortex and hippocampus in extinction and the modulation by context, respectively. Here we tested whether cathodal transcranial direct current stimulation (tDCS) acutely impairs avoidance-based learning using a reversal learning task, mimicking impairments in extinction of avoidance hypothesized to underlie persistent anxiety despite treatment.

Methods: Forty-four participants completed a contextual reversal learning task with the goal to avoid losing points as much as possible. During the first phase (initial training) participants saw two sets of images either presented in Context 1 (images A/B) or Context 2 (images C/D). Selecting images A and C resulted in losing points, on average, over stimulus B and D, which generally resulted in no points lost. After meeting a learning criterion participants started the reversal phase. During reversal, image pair A/B now appeared in a new Context (context dependent reversal condition), whereas image pair C/D continued to appear in the same Context (context independent reversal condition). Regardless of context, all contingencies reversed, i.e. images B and D resulted in points lost and images A and C resulted in no loss of points. Critically, participants received either 2 mA cathodal tDCS (n=22) or sham stimulation (n=22) targeting the left dorsolateral prefrontal cortex (DLPFC) starting at the beginning of reversal and continuing throughout.

Results: Analyses showed that the groups did not perform significantly different during the initial training (p=.15), suggesting no baseline differences in acquiring stimulus-outcome associations. During reversal, the active tDCS group performed significantly worse compared to the sham group (p=.04). This was true for both context-dependent reversal (p=.045), where the context during reversal differed from context during initial training, and context-independent reversal, where context during reversal and initial training was the same (p=.03). Moreover, context dependent and independent reversal performance was worse than initial learning performance in the active tDCS group (p=.01 and p<.0001 respectively). Yet, in the sham group performance during context dependent reversal was not significantly different from performance during initial training (p=.23), while context independent reversal performance was significantly worse than initial training performance (p=.04).

Conclusions: These observations suggest that cathodal tDCS targeting the DLPFC can impair the ability to flexibly update stimulus-outcome contingencies during reversal learning. This impairment is regardless of whether context in which reversal took place changed or remained the same as during initial learning acquisition. The observation that a change in context during reversal did not impair learning as compared to initial acquisition when no tDCS was delivered is consistent with the importance of context in stimulus-outcome associative learning. These findings may ultimately provide insight into how tDCS can be used for the improvement of exposure-based treatments for anxiety and fear-based disorders.

WEEKLY ASSESSMENT OF YOGA HOME PRACTICE: AGREEMENT WITH DAILY DIARIES

Sage Feltus, BA, Summer Peterson, Rich Jones, Geoffrey Tremont, Ivan Miller, Lisa Uebelacker

Objective: To evaluate a weekly yoga practice assessment instrument designed to assess number of classes attended in the previous week, number of times engaged in formal home yoga practice, total number of minutes engaged in formal home yoga practice in the past week, and number of times engaged in informal home yoga practice. "Informal" practice was defined as "in the middle of other activities, you spent a few moments engaged in asanas/postures, focus on breath, body awareness, or very brief meditation, for less than 5 minutes at a time." We assessed agreement between this weekly assessment and a daily home practice log.
Design and setting: Seventy-two community yoga practitioners completed online daily yoga logs for 28 days as well as the weekly yoga practice assessment four times over the 28 day period.
Results: We examined agreement between the two methods on the four indices of amount of weekly yoga practice. We found acceptable agreement between the two methods for number of classes, number of times engaged in formal home practice, and total number of minutes engaged in formal home practice. Agreement was lower for number of times engaged in informal practice.
Conclusions: These data provide support for use of a weekly yoga practice assessment to assess number of classes attended and amount of formal but not informal home practice.

MENTAL HEALTH SERVICE UTILIZATION PATTERNS BY AGE FOR VETERANS WITH SERIOUS MENTAL ILLNESSES: CHANGING TREATMENT NEEDS?

Ruth Firmin, PhD, Marjorie Crozier, PsyD

Background: A recent and promising development in interventions for individuals with serious mental illness is early intervention. Evidence-based treatments that help young people understand and mange mental health symptoms early have shown great promise (Dixon, et al., 2018; Nossel, et al., 2018). Positive outcomes often include symptom reduction as well as improved social, occupational, and vocational outcomes over time, and early-intervention services have also been shown cost-effective compared to treatment as usual (Rosenheck, et al., 2016). However, despite the strong evidence for the effectiveness of specialized early intervention services, such treatments are not yet widely available. For instance, the Veterans Affairs (VA) service system has few specialty clinics for young people with a first episode of schizophrenia or other serious mental illness. Within the VA, the Psychosocial Rehabilitation and Recovery Center (PRRC) is an outpatient program developed to provide a range of rehabilitation and therapeutic services that utilize evidence-based interventions for individuals with a serious mental illness. Given the growing evidence for the importance of early-intervention services, the existing infrastructure of PRRCs across VA healthcare systems, and the areas of overlap in treatment targets between PRRCs and evidence-based early intervention services (e.g., multidisciplinary treatment teams, functional and vocational treatment targets; Thompson, et al., 2015), the question emerges—are/how are young people with serious mental illnesses currently engaging in PRRC care?

Methods and Results: To answer this question, this study investigates patterns in treatment engagement and potential differential patterns in factors associated with treatment drop-out among young and aged Veterans with serious mental illness who enroll in the PRRC at the Providence VA over a 5-year period (2014-2019). This study utilizes available data from clinic records and the VA electronic medical record. Data for 330 veterans will be examined to (1) descriptively report who currently utilizes PRRC services (including demographic and clinical information), and (2) compare background, clinical, and treatment utilization (service use and drop-out) across veterans by age.

Discussion: Examining service utilization by age and other relevant demographic information can help inform whether and how people newer to experiences with a serious mental illness currently engage in available PRRC health care. A limitation of this study is a lack of available data on the length between symptom onset and treatment engagement in the PRRC; however, given that few specialty clinics are available currently for this population, these data offer on a sampling of the current state of available treatment. Furthermore, these early findings may have implications for existing PRRC services and ongoing treatment needs of young veterans enrolled. For instance, differential treatment utilization or barriers may indicate changing treatment needs for this younger cohort of veterans with a serious mental illness. Findings also may have implications for the potential development of targeted early-intervention services within the VA healthcare system.

A ROLE FOR THE MuSK-BMP PATHWAY IN NEUROMUSCULAR JUNCTION ORGANIZATION

Lauren Fish, BA; Atilgan Yilmaz, Diego Jaime, Carolyn Schmiedel, Laura Madigan, Justin Fallon

The stability of the neuromuscular junction (NMJ) is critical for proper motor function and is a target for treating neuromuscular disorders. However, the mechanisms by which the NMJ matures and is maintained remain largely unknown. Muscle-specific kinase (MuSK) is a receptor tyrosine kinase with a well-established role in the agrin-LRP4 pathway mediating NMJ formation and stability (Wu et al., 2010). Recent work from our laboratory shows that MuSK, in a manner not requiring its tyrosine kinase activity, is also a BMP co-receptor. MuSK binds directly to BMPs, via its Ig3 domain, as well as the BMP receptors ALK3 and ALK6. MuSK shapes BMP stimulated transcriptional output in myogenic cells and myotubes, notably regulating genes important for NMJ formation including MuSK itself, Dok7 and Wnt11 (Yilmaz et al., 2016). Here, we explore MuSK's role as a BMP co-receptor in regulating NMJ postsynaptic structure. To selectively manipulate MuSK-BMP binding we used CRISPR/Cas9 genome editing to create a mouse line in which the MuSK Ig3 domain is constitutively deleted ('□Ig3-MuSK'). Structural analysis indicates that the levels of synaptic MuSK in □Ig3-MuSK animals are comparable to littermate controls but that the NMJs are abnormal. Confocal analysis revealed that the postsynaptic apparatus in □Ig3-MuSK mice is significantly more segmented compared to wild-type littermates (n=70 sternomastoid NMJs of each genotype from 6 □Ig3-MuSK and 3 wild-type 3-month old animals; Mann-Whitney U-test for difference in segment count, p<0.0001). Such fragmentation often indicates impaired NMJ maturation or stabilization (Amenta et al., 2012). Preliminary ultrastructural analysis indicates that the junctional folds in ΔIg3-MuSK mice are overall shallower and disorganized compared to wild-type. To understand the mechanism mediating MuSK-BMP signaling, we are conducting primary myotube tissue culture experiments. In these experiments we have shown that the Ig3 domain of MuSK regulates transcription of Wnt11, a previously identified MuSK-BMP dependent transcript. Additional characterization is in progress. Together, these results suggest that MuSK-BMP signaling plays a role in NMJ organization and stability.

CHANGES IN PARENTAL PERCEPTION OF BEDTIME RESISTANCE AND SLEEP ONSET LATENCY FOLLOWING ADMISSION TO THE HASBRO CHILDREN'S PARTIAL HOSPITAL PROGRAM

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Background. Sleep problems have been frequently associated with both depressive and anxiety disorders in children and adolescents. Although the literature has identified associations between sleep and psychiatric symptoms, minimal data is currently available regarding the efficacy of integrated day treatment programs on reducing problematic sleep behaviors and improving sleep quality. The Hasbro Children's Partial Hospital Program (HCPHP) is a family-based day program that provides interdisciplinary treatment to youth with combined medical and psychiatric illness. The present study investigated the associations among parent-reported sleep, anxiety, and mood symptoms at admission to the HCPHP, along with changes in sleep behaviors (sleep anxiety & bedtime resistance) and sleep onset latency from admission to discharge.

Method. The sample included children 9-18 years of age (M=14.03, SD=2.38; 61.3% female) who were admitted to HCPHP. Upon admission, parents completed the Children's Depression Inventory 2 (CDI 2) and Screen for Child Anxiety Related Disorders (SCARED) to assess for baseline depression and anxiety symptoms. Parental report of their child's problematic sleep behaviors (i.e., bedtime resistance & sleep anxiety) were also collected and compared from admission to discharge (n = 31) using an abbreviated version of the Children's Sleep Habits Questionnaire.

Results. Children were admitted for an average of 36.74 calendar days (SD = 8.91, range = 19-54). The most frequent medical diagnoses included nutritional deficiencies (35.5%; n = 11) and headache syndromes (12.9%; n = 4). The most frequent psychiatric diagnoses included restrictive eating and/or picky eating (29.0%; n = 9), depressive symptoms (12.9%; n = 4), and encopresis (9.7%; n = 3). Overall, across all diagnoses, parent-reported depressive symptoms at admission were positively correlated with sleep onset latency on weekdays (r = 0.47, p < 0.01), sleep onset latency on weekends (r = 0.50, p < 0.01), and bedtime resistance (r = 0.39, p = 0.03). From admission to discharge, parents reported a significant decrease in bedtime resistance (t = 2.41, p = 0.02). A significant decrease was also identified in sleep onset latency for both weeknights (t = 2.36, p = 0.03) and weekends (t = 2.16, p = 0.04).

Conclusion. Results demonstrate that after participation in an intensive, family-based integrated day-treatment program, parents report significant and clinically meaningful improvements in sleep: children are less resistant when asked to go to bed, and they require less time to fall asleep each night. Additionally, these data suggest that sleep and internalizing psychopathology are linked within this acute, partial-hospital sample, consistent with existing research in inpatient and community-based samples. Collectively, findings highlight the significant effect of intensive treatment on parental perceptions of child bedtime behavior and sleep onset latency across the week. As sleep is a key component of numerous psychiatric conditions, future work should examine the extent to which improvements in sleep during intensive treatment explain subsequent changes in psychiatric symptoms.

SLEEP DIFFICULTY MODERATES THE EFFECT OF PSYCHOSIS RISK SYMPTOMS ON SUICIDAL IDEATION IN HOSPITALIZED ADOLESCENTS

Kara Fox, BA, Elizabeth Thompson (PhD), Jennifer Wolff (PhD)

Background: Youth experiencing psychosis risk symptoms are at higher risk for suicidal ideation. Among adolescents, sleep disturbances are associated with suicidal ideation and behaviors. Considering these findings, this poster explores the association between psychosis risk symptoms and suicidal ideation at different levels of sleep difficulty, controlling for psychiatric diagnosis of major depressive disorder (MDD).

Methods: A sample of adolescents in the Bradley Hospital Inpatient Unit (n = 140) completed the PRIME Screen for psychosis risk symptoms, a sleep difficulty scale and the Suicidal Ideation Questionnaire (SIQ) for suicidal ideation. The PRIME is a 12-item screener that asks respondents how much they agree that they have experienced psychosis-risk symptoms, ranging from a general sense of something feeling odd or unusual, to more specific symptoms, such as hearing voices or believing someone is planning to hurt them. Ratings are based on a 7-point Likert scale ranging from 0 (definitely disagree) to 6 (definitely agree). Difficulty falling asleep for the past seven days was rated on a 5-point scale ("I had difficulty falling asleep", 0 = not at all, 4 = very much). The SIQ assesses the respondents' frequency of suicidal thoughts from "never" to "almost every day". The CHIPS was administered by psychology staff to assess mental health diagnoses, including MDD. Most participants (n = 100, 71.4%) met criteria for an MDD.

Results: Regression results indicated that PRIME symptoms, but not sleep difficulty, predicted suicidal ideation, beyond the effects of MDD diagnosis. However, sleep difficulty moderated the effect of PRIME symptoms on SIQ scores; effects of PRIME symptoms on SIQ were probed at three levels of sleep difficulty (low, moderate, high) controlling for MDD. Among adolescents with low sleep difficulty, psychosis risk symptoms as assessed by the PRIME were not significantly linked to suicidal ideation on the SIQ. At a moderate level of sleep difficulty, psychosis risk symptoms had a small significant effect on suicidal ideation in a positive direction (i.e. more PRIME symptoms were associated with greater suicidal ideation scores). At a high level of sleep difficulty, psychosis risk symptoms had a moderate positive effect on suicidal ideation.

Conclusion: Findings indicate that sleep difficulties among youth with psychosis risk symptoms may be associated with increased risk of suicidal ideation. These results suggest that sleep interventions may be important for reducing suicidal ideation in youth with psychosis-risk symptoms.

THE EFFECTS OF MATERNAL PARENTING BEHAVIOR, STRESS, AND DEPRESSION ON INFANT CHRONIC HEALTH PROBLEMS

Laura Frank, BS, Kristyn Wong, Brittney Josefson, Ronald Seifer, Stephanie Parade

Previous research has demonstrated that maternal parenting stress and depression are associated with infant physical health (Cousino & Hazen, 2013; Rahman et al., 2004). Yet not all infants whose mothers are highly stressed or depressed experience chronic health problems, and little is known about the conditions under which parenting stress and depression contribute to infant health outcomes. We explore maternal responsiveness and positive parenting practices as moderators of the associations among maternal depressive symptoms, parenting stress, and infant chronic health problems.

The current sample is drawn from an ongoing study of early adversity and maternal-child health (n=295 mother-infant dyads). Mothers ranged in age from 18-44 years (Mean = 26 years) and were racially and ethnically diverse (40% Hispanic; 42% white, 19% black, 7% Biracial, 32% other races). Sixty-one percent of mothers had less than or equal to a high school degree, 66% of the women were unemployed in pregnancy, and 44% were first time mothers. Fifty-four percent of infants were female.

At six months postpartum, mothers reported on their parenting stress (Parenting Stress Index: Short Form; Abidin, 1995), depressive symptoms (Patient Health Questionnaire-9; Kroenke et al., 2001), and parenting behavior including maternal non-responsiveness (Maternal Responsiveness Questionnaire; Leerkes, 2016) and positive parenting practices (Parenting Practices Questionnaire; Shepard et al., 2010). Mothers also completed a semi-structured interview to assess infant health problems (e.g. respiratory issues, GI issues, skin issues, etc.) during the first six months of life. Interviews were coded based on group consensus and a total score for infant chronic health problems was calculated.

Maternal parenting stress and depressive symptoms were not associated with infant chronic health problems in simple correlations. However, parent behavior moderated these associations. In multiple regression analyses, there was a significant interaction of maternal parenting stress and maternal non-responsiveness in the prediction of infant chronic health problems (B = .21, p = .014). As illustrated in Figure 1, at high levels of maternal non-responsiveness, parenting stress was positively associated with infant chronic health problems (B = .20, p = .04). However, at low levels of non-responsiveness this association was not significant (B = -.10, p = .346). There was also a significant interaction of maternal depressive symptoms and positive parenting practices in the prediction of infant chronic health problems (B = -.23, p = .004). As illustrated in Figure 2, at low levels of positive parenting, maternal depressive symptoms were positively associated with infant chronic health problems (B = .36, p = .004). However, at high levels of positive parenting, this association was not significant (B = -.18, p = .147).

Taken together, these results suggest that maternal behavior buffers the effects of parenting stress and maternal depressive symptoms on infant health problems. Our findings extend those focusing on interactions of parental emotions and behavior in the prediction of infant psychosocial outcomes to focus on infant physical health. Findings from this study indicate that targeting parenting behavior and reducing parenting stress and depressive symptoms may improve physical health outcomes among infants developing in high-adversity contexts.

CHARACTERIZATION OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION RETREATMENT SERIES IN A NATURALISTIC ENVIRONMENT

Andrew Fukuda, MD, PhD, Eric Tirrell, Linda L Carpenter

Introduction:
Repetitive Transcranial Magnetic Stimulation (rTMS) is a neuromodulatory treatment modality that is FDA approved for treatment of patients suffering from depression unrelieved by standard pharmacotherapy. Many clinical trials have characterized rTMS's beneficial effects in patients receiving an acute course of rTMS for the first time. Despite the significant improvements that patients experience from rTMS, due to the nature of the illness and the lack of evidence-based rTMS maintenance protocols, most patients will eventually experience symptom relapse or a recurrent depressive episode and seek repeat treatment with rTMS. Data regarding the outcome with rTMS retreatment courses is sparse. We characterized treatment outcomes for patients from the Butler TMS Clinic who received more than one treatment series.

Method:
Utilizing the de-identified database of measures routinely collected before, during, and after a course of treatment in Butler Hospital's TMS clinic, we conducted a retrospective analysis of outcomes for patients who had received two or more rTMS series. All met criteria for pharmacoresistant major depressive disorder (MDD) as well as eligibility criteria for insurance coverage of a standard acute (and repeat) course of rTMS therapy. PHQ9 and IDSSR were collected at baseline and serially during each treatment series, with final treatment score used to define response and remission (50% reduction in scores from baseline) and remission (IDSSR score ≤ 14; PHQ-9 score ≤ 4).

Results:
From 2012 to 2018 there were 45 patients who received 2 or more treatment series; 10 had 3 or more courses of rTMS. The lapse of time between end of the first treatment series and the beginning of their retreatment varied from 10 - 249 weeks, (mean 56). Baseline IDSSR scores prior to the retreatment series were significantly lower than they were prior to the first series, reflecting the fact that most patients returned for TMS introduction before they relapsed to the prior level of symptom severity. Longer duration of time between treatment series was associated with higher depression severity when starting TMS retreatment. The re-treatment TMS response rates measured via IDSSR and PHQ-9 were 55.6% and 65.9%, respectively. Retreatment remission rates were 37.8% (IDS-SR) and 48.9% (PHQ-9) with distributions across outcome categories generally the same for initial and retreatment series. The average number of treatments during the retreatment series was 32.53 with a median of 36, similar to the standard protocol utilized in the initial series. The majority of patients had symptom reduction with retreatment back to the level they achieved with the initial course of TMS.

Conclusion:
Our naturalistically treated sample of MDD patients receiving multiple courses of TMS therapy showed that repeat treatment with TMS in the face of depressive relapse is successful for producing response in the majority of cases. Although the length of time that elapsed between TMS courses varied greatly, on average, patients had somewhat less severe symptoms when they presented for retreatment, compared to their baseline severity for the initial course. About half of patients fully recaptured their prior level of symptom improvement, and some patients finished the retreatment series with even lower final scores on the depression scales.

IDENTIFYING LATENT GROUPS OF INDIVIDUALS WITH FIRST EPISODE PSYCHOSIS BASED ON SOCIAL RELATIONSHIPS: A RECONSIDERATION OF SOCIAL FUNCTIONING

Emily Gagen, PhD, Diana Perkins, M.D.; David Penn, Ph.D.

Background: First episode psychosis (FEP) occurs at a important developmental time for adolescents and young adults when social relationships are of particular importance. The concept of social functioning in psychosis has frequently utilized concepts from the chronic serious mental illness (SMI) literature and as such, can lack emphasis on these relationships as being critical components of an individual's illness and recovery. Ascertaining potential patterns of social functioning in FEP individuals can help guide treatment and identify important ways in which individuals differ in this area.

Method: The current study used latent class analysis (LCA) to identify subgroups in a sample of FEP individuals presenting for treatment at three early psychosis coordinated specialty care clinics (n=134). Groups were identified based on social functioning, which was defined as satisfaction with social relationships and frequency of in-person and electronic communication with peers, family, and significant others. Groups were further characterized using covariates measuring demographic and clinical features.

Results: LCA resulted in three classes: Class 1 (Dissatisfied) demonstrated the least satisfaction with their social relationships, reported the least frequent contact with others and greatest degree of symptom severity, particularly with regard to depression and avolition. Class 2 (Satisfied) reported the greatest degree of satisfaction and reported frequent contact with peers and family, as well as the lowest degree of symptom severity. Class 3 (In-Between) reported some satisfaction with their relationships but a significant amount of dissatisfaction as well, and reported some contact with peers and family. Class 3 reported some depression as well as significant levels of embarrassment.

Conclusions: Results are consistent with previous efforts to identify homogenous subgroups among FEP individuals and those with schizophrenia, and extend the findings of other studies that have based classification on premorbid adjustment. Nuanced approaches to defining social functioning in FEP are indicated, as are varied approaches to treatment based on objective and subjective indicators of social interactions and social relationships.

GENDER EQUITABLE ATTITUDES & RAPE MYTH ACCEPTANCE AMONG RHODE ISLAND HIGH SCHOOL ATHLETES

Jillian Gamache, BA, Vanessa Biniungo, Katherine W. Bogen, Mazheruddin M. Mulla, Lindsay Orchowski

Up to one in three adolescents experience adolescent relationship abuse (ARA), defined as physical, sexual, and psychological abuse in adolescent romantic, dating, or intimate relationships (Exner-Cortens, Eckenrode, & Rothman, 2013). ARA is associated with numerous negative health outcomes, including depression, reproductive health problems, acute suicidality and suicide attempts, teen pregnancy, HIV infection, adult relationship instability, and later cycles of violence victimization and perpetration (De Koker et al., 2013). Moreover, violence victimization is associated with poor academic performance and frequent school absence (Hammig & Jozkowski, 2013; Juvonen, Wang, & Espinoza, 2011). Adolescent relationship abuse prevention may therefore improve both academic and health outcomes. Notably, approximately 59% of 10th-grade students participating in some team sport throughout the academic year (ChildTrends, 2016). Participation in high school sports is associated with hostile sexism, acceptance of violence, and acceptance of rape myths among college men (Forbes et al., 2006), as well as higher rates of sexual coercion among high school boys (Young et al., 2017). This study examined the association between athletic involvement, rape myth acceptance, and gender-equitable attitudes among a sample of 10th grade high school students in Rhode Island. Data were gleaned from the baseline assessment of a larger evaluation of a sexual assault prevention program for high school youth. It was expected that participation in athletic participation would be associated with higher levels with rape myth acceptance. It was also hypothesized that athletic participation would be associated with lower levels of gender-equitable attitudes. As studies demonstrate an association between participation in athletics and risk factors for sexual aggression among boys and men, these associations were examined among boys and girls in separate analyses. Method: With passive parental consent and adolescent assent, a sample of 2, 828 10th-grade was recruited from 27 high schools in Rhode Island and Massachusetts. Students enrolled in the research completed an anonymous survey as part of a larger CDC-funded project evaluating a social norms intervention to reduce dating and sexual violence. of the measure of Gender Equitable Attitudes, including items such as "A guy never needs to hit another guy to get respect," were modified from Pulerwitz & Barker (2008). The assessment Rape Myth Acceptance, including items such as "many girls lead a guy on and then to claim it was sexual assault," was modified from Payne et al. (1999) and Cook-Craig et al. (2014). Students indicated whether they were a member of an athletic team and answered a demographic question assessing gender identity. Researchers computed mean scores for measures of rape myth acceptance and gender-equitable attitudes. Results: A pair of two-way ANOVAS were conducted to assess the effects of gender (boys versus girls) and athletic status (athletes versus non-athletes) on the dependent variables of rape myth acceptance and gender equitable attitudes. There was main effects of gender and athletic status on both dependent variables; boys and athletes had significantly higher levels of rape myth acceptance and significantly lower levels of gender equitable attitudes compared to girls and non-athletes. There was also a significant interaction effect of gender by athletic status on gender equitable attitudes, such that gender equitable attitudes were lowest among boys who were also athletes, compared to all other groups. Discussion: Findings suggest that the specific peer context of all-boy athletic teams, rather than athletic involvement itself, weakens gender equitable attitudes. Moreover, athletic teams may be important targets for intervention.

REFINEMENT OF ANXIETY SENSITIVITY MEASUREMENT: THE SHORT SCALE ANXIETY SENSITIVITY INDEX (SSASI)

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Anxiety sensitivity, defined as the fear of anxiety and arousal-related sensations, has been among the most influential cognitive-based transdiagnostic risk and maintenance factors in the study and treatment of emotional and related disorders. The currently available anxiety sensitivity measures are limited by their length. Specifically, the length of these instruments discourages the adoption of routine anxiety sensitivity assessment in clinical or medical settings (e.g., primary care). The goals of this study were to develop and assess the validity and reliability of a short version of the Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007), entitled the Short Scale Anxiety Sensitivity Index (SSASI), using three independent clinical samples. Results indicated that the abbreviated five-item version of the SSASI had good internal consistency and a robust association with the ASI-3. Further, across the samples, there was evidence of unidimensionality and excellent convergent and discriminant validity. There also was evidence of partial measurement invariance across sex and full measurement invariance across time. Overall, the five-item scale offers a single score that can be employed to measure anxiety sensitivity. Use of the SSASI may facilitate screening efforts and symptom tracking for anxiety sensitivity, particularly within clinical settings where practical demands necessitate the use of brief assessment instruments.

THE IMPACT OF TRANSCENDENTAL MEDITATION ON DEPRESSION AND BLOOD PRESSURE IN CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW & META-ANALYSIS

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Background: Cardiovascular disease (CVD) is associated with high morbidity rates and is the leading cause of death in the United States. Psychosocial factors (e.g., depression) are associated with poorer CVD outcomes. Meditation is gaining popularity in the U.S. as a stress management technique. Transcendental Meditation (TM)—a form of silent mantra meditation—may offer an adjunctive strategy to reduce symptoms of depression and improve markers of cardiovascular health, such as blood pressure (BP) in adults with CVD.

Objective: To examine the efficacy of TM in improving markers of cardiovascular health (e.g., blood pressure) and aspects of psychological functioning (e.g., depression) in adults with CVD.

Method: Studies were retrieved from searches of electronic bibliographic databases, reference sections of related review papers, government databases (i.e., NIH RePORTER, clinicaltrials.gov), and tables of contents of relevant journals. Eligibility criteria included (a) evaluation of TM (b) in adults with either hypertension, chronic CVD, and/or experiencing a cardiovascular event (e.g., ischemic stroke, myocardial infarction) and (c) inclusion of a control condition. Two members of the research team coders extracted data from each study and discrepancies between coders were resolved through discussion. Weighted mean effect sizes and 95% Confidence Intervals [CIs] were computed to assess between- and within-group changes.

Results: The search strategy identified 590 unique records following removal of duplicate records. The final sample included nine studies (N = 851; M age = 60 ± 8 years; 47% women). Between-group analyses revealed no systolic or diastolic BP differences between the TM group and controls. Findings indicated pre- to post-group improvements in systolic (d+ = 0.31, 95% CI = 0.03, 0.59, k = 6) and diastolic (d+ = 0.53, 95% CI = 0.14, 0.92, k = 6) BP in the TM group. There were no between- or within-group improvements in depressive symptoms among TM participants and controls.

Conclusions: TM was associated with improvements in BP for within group changes. However, these changes were not statistically different from controls. The small number of studies meeting inclusion criteria may have limited our ability to detect between-group differences. Randomized controlled trials with larger samples, measuring additional psychological outcomes, and additional follow-up assessments are needed to fully understand the effects of TM in adults with CVD.

PSYCHOMETRIC VALIDATION OF THE MODIFIED DRINKING MOTIVES QUESTIONNAIRE–REVISED IN A PSYCHIATRIC SAMPLE

Yulia Gavrilova, MA, Claire Blevins, Ph.D., Ana Abrantes, Ph.D.

Introduction: Measures of motives for alcohol use provide an important avenue for understanding underlying psychological reasons that drive use. The Modified Drinking Motives Questionnaire–Revised (MDMQ-R; Grant et al., 2007) measures five drinking motives: social, enhancement, conformity, coping-with-anxiety, and coping-with-depression. Purpose: The present study aimed to: (1) validate the factor structure and internal consistency of MDMQ-R in psychiatric sample of polysubstance-using young adults (YA), and (2) evaluate the equivalence of factor structure across exclusive alcohol-using and polysubstance-using YA. Method: Participants were 256 YA (18-26 years; M= 21.15) admitted to the YA partial hospitalization program at a private psychiatric hospital (63% female, 78% Caucasian). Results: A confirmatory factor analysis specifying the MDMQ-R item-loading pattern revealed that items loaded on their respective latent factors (ps<.01; loadings between .50-.90). However, goodness of fit statistics in the overall sample revealed a poor to adequate-fitting model: $\chi2=1118.49$, df=340, p<.01; CFI=.85, SRMR=.09; RMSEA=.095, 90% CI=.09-.10, p<.01. Model fit in alcohol-only and polysubstance-using samples was similarly poor. Suggested model modifications did not significantly improve fit. Discussion: Results suggest that the factor structure of MDMQ-R did not replicate in the present sample. Potential explanations are explored and future directions are discussed in light of the results, including generalizability and clinical utility.

DEMOGRAPHIC AND CLINICAL DIFFERENCES IN ADOLESCENTS WHO ENGAGE IN NON-SUICIDAL SELF-INJURY VS. THOSE WITH UNDISCLOSED SUICIDE ATTEMPTS

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Objective: Non-suicidal self-injury (NSSI)—defined as the deliberate destruction of one's own body in the absence of intent to die—is an increasingly common and serious problem. Prior research shows that NSSI is a strong predictor of future suicide attempt (SAs), which is defined as the deliberate destruction of one's own body in the presence of intent to die regardless of lethality. Studies show that children and adolescents are often reluctant to disclose SAs to caregivers or treatment providers due to fear and stigma surrounding suicide. To address both related issues, we sought to examine the demographic and clinical differences associated with previously undisclosed SAs in children recruited for a study about NSSI only.
Methods: We examined data from N=50 children ages 11-16 (M=14.34+1.45; 90% female) in an IRB-approved study. Enrollment was based on parental report that their child engaged in NSSI without any prior SAs. Measures included: Wechsler Abbreviated Scale of Intelligence; Kiddie Schedule for Affective Disorders and Schizophrenia; Columbia-Suicide Severity Rating Scale; and Self-Injurious Thoughts and Behaviors Interview. Independent-samples t-tests and chi-square analyses were used to compare the NSSI-only vs. undisclosed SA groups.
Results: We found that n=32/50 (64%) of participants recruited for an NSSI-only study had at least one previously undisclosed SA. Participants with NSSI+undisclosed SAs had significantly lower IQ (NSSI M=109.2 vs. SA M=95.4, t=3.38, p<.01), greater number of siblings (NSSI M=1.4 vs. SA M=4.0, t=-3.24, p<.01), and higher rates of post-traumatic stress disorder (PTSD) (NSSI 9% vs. SA 38%, $\chi2$=5.54, p<.05) than those with NSSI-only. Participants with NSSI+undisclosed SAs also had a younger age of onset of NSSI (NSSI M=13.16 vs. SA M=11.00, t=3.03, p<.01) and suicidal ideation (SI) (NSSI M=12.68 vs. SA M=11.19, t=2.57, p<.05) than participants with NSSI-only. In addition, participants with NSSI+undisclosed SAs were more likely to have an aborted SA in the past 30 days (NSSI 13% vs. SA 63%, $\chi2$=12.91, p<.001), and an interrupted SA over the course of their lifetime (NSSI 25% vs. SA 56%, $\chi2$=4.55, p<.05) compared to their NSSI-only counterparts. There were no significant between-group differences for age, sex, anxiety, depression, ADHD, disruptive behavior, preparatory acts, or SI severity.
Conclusion: First, participants with NSSI+undisclosed SAs did not disclose prior SAs until asked in a systematic way via assessments administered in this study, despite multiple evaluations by a variety of mental health professionals prior to enrollment. Thus, our results underscore the importance of using structured, evidence-based measures rather than unstructured clinical interviews to assess NSSI and suicidality in youths. Second, findings suggest that certain demographic and clinical characteristics are associated with undisclosed SAs among those who present with NSSI, including greater number of siblings, lower IQ, PTSD diagnosis, younger age of onset of NSSI and SI, recent aborted SA, and lifetime history of interrupted SA. Thus, adolescents presenting with NSSI and these characteristics may be more likely to have prior SAs, and should be evaluated via structured, evidence-based assessments for suicidality. Finally, findings emphasize the importance of early identification and monitoring of NSSI and SI in youths, and highlight the role that family environment, trauma, and cognitive factors may play in undisclosed SAs and adolescents' ability to cope with stressors. Therefore, early intervention for NSSI and SI is warranted, and family functioning, trauma, and enhanced coping via concrete skill building may be important treatment targets for adolescents presenting with NSSI, as these variables confer increased risk for undisclosed SAs.

NEURAL RESPONSES TO ALCOHOL CUES IN HEAVY-DRINKING SMOKERS

Kimberly Goodyear, PhD, Robert M. Swift, M.D., Ph.D., Lorenzo Leggio, M.D., Ph.D., and Carolina L. Haass-Koffler, Pharm.D.

Background: Approximately 80% of individuals with an alcohol use disorder (AUD) are also cigarette smokers, and despite previous research on functional magnetic resonance imaging (fMRI) cue-reactivity, the behavioral and neural responses to alcohol cues in heavy-drinking smokers have not been investigated.

Study Objectives: The goal of this pilot study was to examine the effects of visual and olfactory alcohol cues on blood-oxygen-level-dependent (BOLD) activity in heavy-drinkers during fMRI scan.

Methods: Heavy-drinking smokers (n = 10) participated in the alcohol fMRI cue-reactivity task. We implemented an alcohol cue-reactivity task, where participants, after being exposed to alcohol and neutral cues (visual and olfactory), rated their craving for alcohol and cigarettes with visual analog scales. Independent samples t-tests were implemented to compare alcohol and cigarette craving during alcohol and neutral cues. Further, whole-brain and region of interest (ROI) analyses were done to compare BOLD responses to alcohol and neutral cues. Lastly, correlation analysis was done on activation in ROIs and baseline craving and drinking and smoking behaviors.

Results: Our behavioral results showed that participants had higher alcohol craving during alcohol cues compared to neutral cues ($p < .05$). Further, our whole-brain analysis revealed significant activation in the right lingual gyrus ($p < .005$). The ROI analysis showed significant activation in the right orbitofrontal cortex (OFC) ($p < .05$) when comparing alcohol to neutral cues. Correlation analysis indicated that there was a positive associations with baseline alcohol craving and activation in the right ventral striatum (VS) ($p < .05$) and the left anterior cingulate cortex (ACC) ($p < .05$). There were also positive associations with total alcohol drink in the ninety days prior to the experiment and activation in the right VS ($p < 0.0001$), left VS ($p < .01$) and left ACC ($p < .0001$).

Conclusions: We have provided preliminary evidence that there are distinct behavioral and neural patterns in response to alcohol cues in heavy-drinking smokers.

USING EMA TO COLLECT ADHERENCE AND COMPLIANCE DATA OF SEXUAL AND REPRODUCTIVE HEALTH PRODUCTS TO BETTER UNDERSTAND EFFECTIVE USE

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Background:
There is a continuing need for biomedical technologies that effectively prevent unintended pregnancy and/or prevent/treat sexual and reproductive health (SRH) diseases. We aimed to characterize patterns of use of SRH products across varying delivery systems and dosing regimens, in order to more comprehensively understand how women effectively use these technologies. To minimize recall bias, we collected product use data via ecological momentary assessment (EMA) using an automated daily phone survey.
Methods:
Women were enrolled into either a sexual lubricant condition (gel, capsule, film) or a contraception condition (OCP, IVR, spermicide-and-condom (S+C)) for 6-9 months. Order of product use in each condition was randomized. Product use, sexual activity, and menses/spotting information was collected daily via EMA over each consecutive 3-month use period (1 period per product). Overall response rate was estimated and compared by product type using chi-squared tests and analysis of variance (as appropriate).
Results:
Thirty-nine women were enrolled. Mean age was 27.90 years (sd=6.30); 79.5% were non-Hispanic/Latina; 59% reported vaginal sex at least 3-4x/week. Overall EMA response rate was 71% (peak response rate was 90% during the first 3-month use period). Overall response rate for products used in conjunction with sex (gel, capsule, film; S+C) was 69% (83% response rate in the first use period) with highest response rate (averaged over use period) for OCP's. In general, compliance rates (i.e., strict obedience to primary use instructions) were statistically lower than adherence rates (i.e., adaptation of use instructions while maintaining effect) and differed by product.
Conclusion:
Response rates support the feasibility of using EMA for collection of SRH product use data over a 6- to 9-month period, with rates similar to other behavioral EMA studies (e.g., physical activity). Adherence data provide insight into use patterns that, combined with other in-depth data, facilitate conceptualization of effective use. Understanding why women adapt product use to fit their life circumstances, and collaborating with them to do so within known efficacy parameters, can help decrease method-switching and unintended pregnancy rates.

A QUALITATIVE ANALYSIS OF MEN'S PERCEIVED BYSTANDER BARRIERS TO PREVENT LABORATORY SEXUAL AGGRESSION

Michelle Haikalis, MA, Madison Edwards, David DiLillo

Bystander training programs have recently proliferated on college campuses as a means to reduce sexual assault (Jouriles, Krauss, Banyard, & McDonald, 2018). Enhancing our understanding of the factors that drive intervention decisions is essential to continue improvement of bystander training. To engage in an act of bystander intervention, bystanders must progress through a five-step decision-making model, beginning with noticing sexual risk and ending with taking action to intervene (Latané & Darley, 1970). However, bystanders can be derailed at any point of this model due to a host of barriers (Burn, 2009). To date, investigations of bystander barriers have asked participants to recall experienced barriers across all bystander opportunities over a span of time (e.g., the past month; Bennett, Banyard, & Garnhart, 2014) or report about their perceptions of barriers that could arise during hypothetical vignettes (Katz et al., 2015). The current study aims to build on this work by investigating bystander barriers reported in response to a specific bystander opportunity, presented in a laboratory setting. Use of the laboratory bystander analogue allows for control in the opportunity presented and observation of participant bystander behavior in response to that opportunity. Therefore, the present work will allow for examination into the relation between perceived bystander barriers and engagement in bystander intervention.

The aim of this study was to examine college men's perceived barriers when faced with an opportunity to prevent laboratory sexual aggression towards a woman confederate (n = 77). Men were the focus of the present work, given that men generally engage in less bystander intervention to prevent sexual assault than women, and therefore have more room for growth through targeting bystander barriers (Banyard, 2008; Burn, 2009). Qualitative analysis was used by a 3-person coding team to identify and code key themes in free responses of self-reported cons to intervening during the bystander analogue task. Identified themes were as follows: time/effort allocation, avoiding personal discomfort, conflict avoidance, lacking influence, impression management, and missed opportunities.

Results indicated that the greatest proportion of participants identified conflict avoidance as a barrier (38%), but that only the endorsement of missed opportunities as a barrier predicted failure to intervene ($X^2(1) = 5.781$, p = .016). Though several participants did not identify any barriers to intervention (16.9%), this did not relate to bystander intervention behavior ($X^2(1) = .576$, p = .448), suggesting that those who did not intervene and did not identify barriers may have had low insight. The theme of missed opportunities included statements by participants that suggested propensity to commit sexual aggression, providing an important reminder that, even when using a bystander approach to prevention, not all individuals will feel motivated to prevent sexual aggression. The small sample size in the present work may have precluded detection of significant effects. Future work should aim to identify specific barriers that most directly relate to intervention behavior and target those barriers in bystander training programs. By isolating barriers that have the most direct impact on bystander efforts, bystander training programs can improve their effectiveness in preventing sexual assault.

DIRECT CONVERSION OF FIBROBLASTS TO HYPOTHALAMIC NEURONS: IN SEARCH OF iPOMC

Kaitlyn Hajdarovic, BS, Ashley Webb

The arcuate nucleus of the hypothalamus contains two populations of neurons (POMC neurons and AgRP neurons) which respond to peripheral energy-storage signals in order to drive feeding behavior. These neurons play an integral role in energy homeostasis and are relevant to diseases such as diabetes and obesity. They may also play a role in body composition changes which occur during aging. Studying these neurons in vivo is made difficult by their location in the brain, transcriptional heterogeneity, and relative rarity. While recent publications have established methods to create hypothalamic neurons from induced pluripotent stem cells (iPSCs), however, these cells do not exhibit the hallmarks of aging, even when derived from the cells of aged animals. Direct conversion, in contrast, preserves aging hallmarks through the reprogramming step. To identify transcription factors necessary to convert fibroblasts into neurons, we used lentivirus-based overexpression of candidate transcription factors in mouse embryonic fibroblasts which express GFP under the Pomc promoter. The expression of Achaete-Scute Family BHLH Transcription Factor 1 (Ascl1) and SIX Homeobox 3 (Six3) together resulted in induced neurons which were positive for GFP and Tuj1, a neuronal marker. Moreover, RNA collected from these cells shows high relative expression of the Pomc transcript. This work paves the way as a model to explore mechanisms underlying age-related insulin and leptin resistance in the brain.

BRAIN WEEK RHODE ISLAND

Victoria Heimer-McGinn, PhD, Irene Sanchez, Chloe Knopf

Brain Week Rhode Island (BWRI) is a statewide campaign to make research about the brain accessible and fun to a diverse population. Our goals are to (1) showcase the wealth of neuroscience activity and advocacy in Rhode Island, (2) educate and inspire the next generation of neuroscientists, and (3) promote collaboration across brain-related institutions and organizations. Created in 2016 by Cure Alliance for Mental Illness, BWRI has more than doubled in audience and scientific scope. In 2018, for instance, we welcomed 2,000 attendees and featured dozens of notable panelists, performers, and top experts in their respective fields – doctors, administrators, professors, dancers, artists, patients and patient advocates among others. In the current publication we provide a summary of BWRI and seek to evaluate our program based on the three outlined goals.

THE RELATIONSHIP BETWEEN SOCIAL-COGNITIVE BIASES, SELF-CRITICAL ATTRIBUTIONS, AND REACTIVITY TO INTERPERSONAL REJECTION AMONG INDIVIDUALS WITH NSSI

Caroline Holman, MA; Emily Brackman, M.A., Margaret S. Andover, Ph.D.

While there is ample research implicating emotion dysregulation and reactivity in NSSI (i.e., Gratz & Roemer, 2008; Nock et al., 2008), there are few studies examining how interpersonal factors may contribute to these behaviors. Some studies have identified perceived rejection, loss, and anger towards the self and others as interpersonal antecedents to NSSI (e.g., Welch & Linehan, 2002; Nock et al., 2009). Limited research has also associated NSSI with relational difficulties (Adrian et al., 2011) and social problem solving deficits (Nock & Mendes, 2008). However, the cognitive underpinning of how interpersonal contexts may contribute to states of heightened emotionality among individuals with NSSI is not well understood, representing a dearth in the literature. Preliminary research indicating that individuals with NSSI may be prone to more negative interpretations of ambiguous social cues (Holman et al., 2016) suggests one potential explanatory mechanism.

The current study seeks to explore the roles that social-cognitive biases, self-critical attributions, and rejection sensitivity may play in NSSI. Our total sample includes 167 participants, 39.6% of which reported a history of NSSI. Using a vignette featuring a hypothetical blind date, we hypothesized that the relationship between negative interpretations of ambiguous social cues during the date and emotional reactivity in response to rejection would be moderated by NSSI history. This hypothesized moderated relationship was significant, $t(163)= -2.55$, $p = .01$, $B = -.84$, $SE(B) = 0.33$, such that among non-self-injurers only, more positive interpretation of ambiguous cues predicted greater emotional reactivity in response to rejection. Additionally, we hypothesized that the relationship between rejection reactivity and endorsing a self-critical explanation for rejection would be moderated by NSSI history. This moderation was also significant, $B = .91$, $SE(B) = .47$, $p = .05$, such that among those with an NSSI history, greater negative emotionality in the face of rejection was associated with greater odds of blaming oneself for this occurrence. This association was not significant among non-self-injurers.

Taken together, these findings suggest that greater emotional reactivity in response to an interpersonal rejection that violates previous positive interpretations of social cues may characterize non-self-injurers, while an association between greater rejection sensitivity and a more self-critical attributional style may be specific to individuals who do endorse a history of NSSI. Additional research is needed to continue to uncover the social-cognitive mechanisms contributing to greater emotional reactivity, and subsequently to NSSI, within interpersonal contexts.

MULTIPLE GRASP TYPES CAN BE RELIABLY DECODED FROM THE PRECENTRAL GYRUS OF PEOPLE WITH ALS WITH PROGRESSIVE LEVELS OF MOTOR IMPAIRMENT

Kevin Huang, MD; David Brandman, Jad Saab, Vamsi Chavakula, Carlos Vargas-Irwin, Susan Fasoli, Christine Blabe, Brittany Sorice, Beata Jarosiewicz, John P. Donoghue, Jamie Henderson, Krishna Shenoy, Leigh Hochberg

Background: Intracortical brain-computer interfaces have the potential to improve functional independence for individuals with motor impairment from disorders such as amyotrophic lateral sclerosis (ALS). Previous work has demonstrated that individuals with tetraplegia can control robotic limbs using neural signals decoded from electrodes implanted in the precentral gyrus. However, it is not known whether the severity of paralysis affects the encoding of motion-related neural features in motor cortex. To address this question, we characterized how well we could decode 4 commonly used hand movements (power, pinch, and key grasps, and wrist supination/turn) from intracortical signals recorded from the precentral gyrus of people with ALS who had varying degrees of motor impairment.

Methods: Three research participants with ALS participated in this study. Participant T6 had an ALSFRS score of 14 and was able to visibly perform all 4 hand movements; T7 had an ALSFRS score of 17 and had no visible residual hand movement; and T9 had an ALSFRS score of 12 and had trace residual movement of only the thumb. All participants had intracortical arrays placed in their dominant motor cortex as part of the ongoing BrainGate2 pilot clinical trial. On each trial, participants were asked to "perform, or attempt to perform" one of the above 4 hand or wrist actions while neural signals were recorded. Each action was cued using a text display, followed by a visual go command after a variable delay period.

Results: A total of 759 actions were analyzed between the three participants over six sessions. Binned spike rates were calculated using a semi-automated spike sorter and combined with neural power spectral density to train a linear discriminant analysis classifier tested using leave-one-out cross validation. The action performed/attempted could be decoded with over 92%, 96%, and 89% accuracy for T6, T7 and T9 respectively, during the action epoch (chance = 25%). Additional analysis revealed appropriate temporal evolution of decoding posteriors across the entire trial epoch, including decoding of epochs where the participant was actively relaxing or attending to the task but not actively moving.

Conclusion: Functionally relevant grasps can be decoded accurately from intracortical signals in the pre-central gyrus of humans with ALS of varying levels of motor disability. This work suggests that the severity of ALS will not affect the ability for individuals to generate volitional control signals to activate assistive devices through intracortical BCIs.

CORRELATES OF CHRONIC LOW-GRADE INFLAMMATION IN YOUNG, LOW-INCOME CHILDREN

Lindsay Huffhines, MS, Yo Jackson, PhD

Most research on the pathogenesis of cardiovascular disease (CVD) has focused on cardiometabolic risk factors beginning in middle age or later (Guarner & Rubio-Ruiz, 2015), but childhood is emerging as a critical period for the development of CVD (Wideman et al., 2016). High rates of obesity and chronic low-grade inflammation in adolescence each independently predict CVD in adulthood, yet little is known about their origins in early childhood (Franceschi et al., 2014; Skinner et al., 2010). Very few studies to date have evaluated a comprehensive panel of inflammatory proteins in young children, much less investigated multiple correlates. Identifying which psychosocial and health factors are associated with inflammation in a high-risk sample of young children is a critical first step to determining how CVD develops prospectively. Health behaviors, including sleep, physical activity, and diet are highly correlated with obesity-and thus serve as prime targets for intervention-yet it is unknown whether they also correlate with inflammation. Psychosocial factors, including adversity exposure, family cohesion, and psychiatric disorders, are similarly correlated with obesity and may serve as an important area of intervention in efforts to reduce inflammation. Surprisingly, demographic factors, such as age, gender, race/ethnicity, and socioeconomic status (SES) are also rarely studied together with inflammation in youth samples, limiting knowledge on which groups may be most at risk.

Thus, the purpose of the current study was to examine associations between inflammation and correlates known to be previously linked with obesity. Participants included a sample of 145 children ages 3 to 5 recruited from Head Start centers and child protective services. Children were 74% black, 17% white, 4% multiracial, and 4% other. The sample was predominantly low-income, with 54% endorsing income at or below $10,000 per year. Saliva samples were collected with a Salimetrics Children's Swab and later assayed for a panel of inflammatory proteins including C-reactive protein (CRP), interleukin-6 (IL-6), interleukin-8 (IL-8), interleukin-1 beta (IL-1β), and tumor necrosis factor-alpha (TNF-α). Parents completed demographics questionnaires, a 57-item adversity measure, the family cohesion subscale from the Family Environment Scale, the Children's Sleep Habits Questionnaire, the Children's Eating Habits Questionnaire, and the Outdoor Playtime Checklist. Child height and weight was also collected.

Results revealed that BMI was correlated with IL-6 only ($r=0.24$); diet with IL-6 ($r=-0.39$) and IL-1β ($r=-0.47$); physical activity with IL-6 ($r=-0.22$), IL-8 ($r=-0.40$), and TNF-α ($r=-0.59$); and sleep with TNF-α ($r=-0.31$). Further, dosage of adversity was correlated with IL-8 ($r=0.15$), and TNF-α ($r=0.18$). Having a psychiatric diagnosis was correlated with IL-1β ($r=0.29$), IL-8 ($r=0.34$), and TNF-α ($r=0.39$). Family cohesion was not significantly correlated with any inflammatory protein. Gender was correlated with IL-6 ($r=-0.26$), but no significant correlations emerged for age, race, or SES. Significant correlations were at $p<.001$.

This study provided first-time evidence of associations between inflammation and health, psychosocial, and demographic factors, contributing to knowledge of how CVD develops early. Exposure to early adversity and having a psychiatric disorder appear to be significant risk factors, particularly for proteins that emerge early in the inflammatory process. Findings also suggest that sleep, exercise, and dietary behaviors may affect inflammatory protein levels.

OBSESSIVE-COMPULSIVE DISORDER SYMPTOM SEVERITY AND STRESSFUL LIFE EVENTS

Elyse Hutcheson, BA, Brianna Prichett, BS; Emily Mercer, BA; Sarah Garnaat, PhD; Christina Boisseau, PhD; Maria Mancebo, PhD; Jane Eisen, MD; Steven Rasmussen, MD

Background: Stress, including discrete stressful events, may play an important role in the development and progression of obsessive-compulsive disorder (OCD). Stress and stressful life events (SLEs) have been associated with OCD onset (Gothelf et al., 2004), especially in cases with less family history (Real et al., 2011) and with late onset (Coles et al., 2011). Specific domains of SLEs have been examined in relation to OCD onset, including hospitalization of a family member, major personal illness, loss of a personally valuable object (Rosso et al., 2012); difficulties in family or social relationships, health problems, education, or work (Real et al., 2011); and the major illness or injury of a family member (Gothelf et al., 2004). Extant research suggests that stress levels in general are correlated with OCD severity (Morgado et al., 2013). While existing work has begun investigating relations of SLEs to OCD symptom severity (e.g., Vidal-Ribas, 2015), more research is needed to determine whether discrete SLEs are likely to impact existing OCD symptoms, and if certain domains of SLE are more likely to exacerbate existing OCD symptoms. A better understanding of the relation between domains of SLEs and OCD symptom severity could inform patient and provider approaches to treatment should an SLE occur. This study aims to assess whether SLEs within the 12 months prior to assessment are related to OCD symptom severity, and whether SLEs in Family, Health, and Love/ Marriage domains in the twelve months prior to assessment significantly predict severity of OCD symptoms.

Methods: The present sample included 156 adults in the Brown Longitudinal Obsessive-Compulsive Study (BLOCS) with a DSM-IV diagnosis of OCD who completed the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) and the Life Events Assessment (LEA) at a single follow-up timepoint. Participants were classified as having experienced a SLE if they endorsed a life event rated as "somewhat stressful" or "very stressful" on the LEA within the twelve months prior to their assessment. The primary outcome measure was OCD severity, assessed with the Y-BOCS.

Results: Preliminary analyses indicated that OCD severity did not differ significantly between participants who reported a SLE in the twelve months prior to assessment (M=17.77, SD=10.43) and those not reporting a SLE (M=16.61, SD=9.37; t(154)=-0.72, p=0.47). Moreover, the presence of an SLE within specific domains in the 12 months prior to assessment did not significantly predict Y-BOCS severity for either the Family [F(1, 152)=0.02, p=0.88], Health [F(1, 152)=2.58, p=0.11], or Love [F(1, 153)=0.09, p=0.76] domains.

Conclusion: These findings suggest that, while associated with onset of OCD, experiencing a SLE in the prior 12 months may not necessarily be related to existing OCD severity, including in the specific domains of Family, Health, and Love/ Marriage. Areas for further research and limitations of the present work will also be discussed.

REASONS FOR SELF-INJURIOUS BEHAVIORS AMONG MALTREATED ADOLESCENTS ENGAGED IN NON-SUICIDAL SELF-INJURY VS. ADOLESCENTS WHO HAVE ATTEMPTED SUICIDE

Gracie Jenkins, BS, Anna Gilbert, B.S., Katharine Musella, B.S., Elana Schettini, B.S., Rebecca L. Babcock Fenerci, Ph.D., Heather MacPherson, Ph.D., Anastacia Kudinova, Ph.D., Petya Radoeva, MD, & Daniel P. Dickstein, MD

Objective: Previous research has shown that children who have been maltreated are at an increased risk of engaging in self-injurious behaviors (SIB). Although this association between child maltreatment and SIB has been strongly established, research has yet to compare maltreatment histories and reasons for SIB in mutually exclusive groups of adolescents engaged solely in non-suicidal self-injury (NSSI) vs. adolescents who made a suicide attempt (SA). To address this gap, we first compared reasons for SIB in maltreated adolescents with NSSI-only vs. SA-only. Second, we examined whether maltreatment type predicted reason to engage in SIB.
Method: Two distinct groups of adolescents between the ages 13 and 17 were enrolled in this IRB-approved study: those currently engaging in NSSI without any prior SAs, and those who made a SA in the last 30 days with no lifetime history of NSSI. Only participants with a history of maltreatment by self-report on the Childhood Trauma Questionnaire (CTQ) were included in the current analyses. The CTQ assesses five types of maltreatment: emotional abuse, physical abuse, emotional neglect, physical neglect, and sexual abuse. The Self-Injurious Thoughts and Behaviors Interview (SITBI) was also administered to assess lifetime prevalence of NSSI and SA as well as reasons for SIB.
Results: Maltreated NSSI participants were significantly more likely to engage in SIB "to get rid of bad feelings," and "to feel something" than the maltreated SA group. Maltreated SA participants were significantly more likely to engage in SIB "to get away from others or get out of doing something," and "to communicate or get attention" than the maltreated NSSI group. Despite these differences, both groups endorsed the same top 3 reasons for engaging in SIB: 1) to get rid of bad feelings, 2) mental state at the time, 3) problems with family. In addition, several maltreatment types arose as significant predictors of specific SIB reasons, with physical neglect predicting SIB reasons in both NSSI and SA groups.
Conclusion: These results suggest that maltreated NSSI participants were significantly more likely to engage in SIB for emotional regulatory reasons than their maltreated SA counterparts, who were more likely to engage in SIB for interpersonal reasons. Our findings also demonstrate that specific forms of maltreatment, particularly physical neglect, increase the likelihood that an adolescent will utilize SIB for specific purposes. The results of the current study are clinically relevant, as they can help inform treatment providers on the different functions that NSSI and SAs serve in youths who have experienced various types of child maltreatment.

CHILD SEX MODERATES THE INDIRECT EFFECT OF LIFETIME STRESS ON BEHAVIOR PROBLEMS THROUGH TEMPERAMENT

Brittney Josefson, MS, Jesse Coe, Jadira Rodriguez, Lauren Micalizzi, Stephanie Parade, Ronald Seifer, Audrey Tyrka

Chronic stress is associated with both internalizing and externalizing behavior problems among children (Klein et al., 2018). There is now evidence to also suggest that stress exposure is related to child temperament (Sudbrack et al., 2015), which in turn predicts behavioral outcomes (Tschann et al., 1996). Few studies, however, have examined the role of child sex in these processes. Using an economically disadvantaged sample, we examined the possibility that child sex may moderate indirect effects of lifetime stress on child behavior problems through temperament.

Participants in this longitudinal study included 274 ethnically and racially diverse (46% Hispanic, 28% White Non-Hispanic, 16% Black, 10% other races) preschool children (M age = 50.86 months) and their primary caregivers. Of children, 143 had child welfare documentation of moderate to severe maltreatment determined via record review, most (86%) families qualified for public assistance, and 131 children were male. Parents completed a semi-structured interview to assess lifetime stress and the Toddler Behavior Assessment Questionnaire (Goldsmith, 1996) to assess child temperament dimensions (activity level, attentional allocation, anger, social fear, inhibitory control) at a baseline assessment. At a 6-month follow-up, parents completed the Child Behavior Checklist (Achenbach & Rescorla, 2000) to assess child internalizing and externalizing behavior problems.

Multi-group structural equation modeling examined whether indirect pathways involving lifetime stress, child temperament, and child internalizing and externalizing behaviors differed as a function of child sex. For each temperament dimension, we compared a model in which all parameters were allowed to vary freely with a model in which the path between lifetime stress and temperament was constrained to equality across boys and girls. Significant moderation by child sex was evident in models examining inhibitory control and attentional allocation; sex differences in models including anger and activity level were trending toward significance. Significant links between stress and temperament were only evident for boys, not girls. The different dimensions of temperament, in turn, predicted both internalizing and externalizing symptoms 6 months later. For example, lifetime stress predicted low appropriate attentional allocation and high anger and activity levels for boys only. Of note, all indirect effects of lifetime stress involving temperament were statistically significant with the exception of social fear. In models testing maltreatment status, rather than lifetime stress, as the predictor, moderated mediational pathways were not significant. However, maltreatment status did consistently predict high child internalizing symptoms, and inhibitory control mediated the association between maltreatment and both internalizing and externalizing problems.

Taken together, results suggest that lifetime stress exerts influence on child behavior problems through child temperament, particularly for boys. This work supports the perspective that temperament is not inherently stable and is affected by environmental influences. Interestingly, the temperament dimensions for which significant moderated mediation was observed (inhibitory control, attentional allocation) are factors associated with ADHD, positing exciting avenues for future research.

GENDER, RACE/ETHNICITY, AND ACADEMIC RANK IN THE DEPARTMENT OF PSYCHIATRY AND HUMAN BEHAVIOR AT THE WARREN ALPERT MEDICAL SCHOOL OF BROWN UNIVERSITY

Kelsey Kangos, MS, Ron Seifer, Elizabeth L. McQuaid

The proportion of female medical school graduates has increased 104% since 1980, indicating a trend toward increasing gender parity (AAMC, 2018). However, data from 2018 show that males remain the majority of medical school graduates (52.6%; AAMC, 2018). In contrast, women attained majority representation in graduate degrees in psychology in 1982 (APA, 2016). The proportion of women in the active psychology workforce was 67% in 2016 (APA, 2016). However, within doctoral departments of psychology, male faculty are more likely to be tenured than women (56% versus 44%; Christidis, Lin, & Stamm, 2018). Furthermore, within psychology and medical departments nationally, women's representation decreases with rank, such that most Assistant Professors are women, and most full Professors are men (AAMC, 2018).

This poster will review the Warren Alpert Medical School of Brown University's Department of Psychiatry and Human Behavior (DPHB) faculty demographic data in comparison to national data from Departments of Psychiatry in terms of gender and race/ethnicity. Patterns in gender, race/ethnicity, and academic rank in the DPHB during the period of 2006-2018 will be displayed. Data from 2006-2016 were presented to the department leadership, and some initiatives were implemented in response to the findings. Data from 2018 were analyzed and compared to the results from 2006-2016 to examine any potential changes following the implementation of initiatives to increase promotions among women and minorities. These efforts within the DPHB related to diversity initiatives will be discussed, including ways to enhance recruitment and retention of racial/ethnic minorities and to promote leadership skills among women. Some examples of initiatives the DPHB has implemented include a competitive research award for individuals from diverse racial/ethnic backgrounds, and an educational leadership award for women to provide support to attend professional development conferences to enhance leadership skills.

PHASIC ALERTING AND EXOGENOUS ATTENTIONAL ORIENTING IN AGING AND MILD COGNITIVE IMPAIRMENT

Tatiana Karpouzian-Rogers, MS, William C. Heindel, PhD; Brian R. Ott, MD; Geoffrey Tremont, PhD; Elena K. Festa, PhD

Objective: Attentional systems include an exogenous spatial orienting network mediated by frontal and parietal cortical regions and cholinergic projections, and an alerting/arousal network mediated by the locus coeruleus-noradrenergic (LC-NA) system. While a prior study in young adults found that phasic alerting interacts with orienting through the selective enhancement of validly cued targets (Festa-Martino et al., 2003), little is known about the effects of healthy aging and mild cognitive impairment (MCI) on the relationship between phasic alerting and exogenous orienting.

Methods: Twenty young controls (YC), nineteen elderly controls (EC) and twenty amnestic MCI patients completed a color discrimination task, in which subjects selected the color of a target that appeared within one of two boxes. Exogenous orienting was manipulated by a brief thickening of the same (valid) or opposite (invalid) box in which the target subsequently appeared. Phasic alerting was manipulated by presenting an auditory burst of white noise simultaneously with the visual orienting cue on half of the trials. Additional trials assessed auditory alerting alone (sound without visual cues) or visual alerting alone (both boxes cued without sound). Reaction time (RT) on correct trials was measured.

Results: All groups displayed significant orienting and alerting effects as reflected in reduced RTs to valid and alerting cues, respectively. However, a significant three-way interaction emerged such that phasic alerting selectively reduced RTs for validly cued but not invalidly cued targets in the YC and EC groups, though not in the MCI group.

Conclusion: Results from this study indicate that phasic alerting interacts with exogenous orienting in young controls and healthy elderly adults through the selective enhancement of the sensory processing of targets; however, this pattern was not observed in individuals with MCI. These findings may have implications for the role of the locus coeruleus in Alzheimer pathology.

CEREBELLAR ATROPHY ASSOCIATED WITH Na+/H+ EXCHANGER 6 (NHE6) MUTATIONS IN CHRISTIANSON SYNDROME

Brian Kavanaugh, PsyD, Brandon Pruett, Paul Caruso, Karen Busch, Matthew F. Pescosolido, Carrie R. Best, Rebecca Bradley, Hannah Marsland, and Eric M. Morrow

Background: Single gene disorders replicating aspects of otherwise heterogeneous neuropsychiatric conditions may help model relevant pathophysiologic mechanisms. Christianson syndrome (CS), caused by mutations in X-linked NHE6, a major regulator of endosomal pH, is one such illness characterized by neurodevelopmental abnormalities including autism, cognitive disability, and neurodegenerative pathology. NHE6 mutations may, therefore, offer insight into the role of disrupted endosomal protein trafficking in neuropsychiatric disease. Here we examine the association between cerebellar atrophy and clinical functioning in CS probands. Supratentorial white matter abnormality was utilized as a control region to address possible whole brain effects.

Methods: Twenty-five T1-weighted midsagittal clinical MRIs from 14 males, ages 0.6-22 years, were identified from the International CS and NHE6 (SLC9A6) gene study network. Measures included presence or absence of cerebellar atrophy/supratentorial white matter abnormality as well as percent change in cerebellar vermis, left hemisphere, and right hemisphere volume (for those with multiple scans). Chi-squared and analyses of variance examined the association of cerebellar integrity to age, history of motor regression, and seizure status.

Results: Cerebellar atrophy was identified in 56% of scans, including 31% of 0-5 year olds and 83% of 6+ year olds. Atrophy was detected in all participants with a history of motor regression (p = .008). Motor regression was associated to vermis volume change (p = .005), but not left or right hemisphere volume change. All participants with atrophy also experienced generalized tonic-clonic seizures (p = .05). Vermis volume change (p = .014), but not left/right hemisphere volume, was associated with the amount of seizure types experienced. Although supratentorial white matter abnormalities were frequently observed (72% of scans), they were not significantly associated to any clinical variables (p > .05).

Conclusions: Cerebellar atrophy occurs in the majority of CS probands, with the majority of atrophy emerging after the toddler years. Such atrophy, particularly in the cerebellar vermis, is subsequently associated with motor regression and heightened seizure intensity. This critical data provides important steps towards identifying the neurobiological abnormalities underlying neurodegeneration in CS.

RHODE ISLAND CONSORTIUM FOR AUTISM RESEARCH AND TREATMENT (RI-CART): A STATEWIDE, POPULATION-BASED RESOURCE FOR STUDIES IN AUTISM

Brian Kavanaugh, PsyD, Carolyn McCormick, Danielle Sipsock, Giulia Righi, Daniel Moreno De Luca, Carrie Best, Beth Jerskey, Joanne Quinn, Susan Jewel, Pei Chi Wu, Rebecca McLean, Todd Levine, Hasmik Tokadjian, Kayla Perkins, Elaine Clarke, Brittany Dunn, Alan Gerber, Elena Tenenbaum, Thomas Anders, Stephen Sheinkopf, Eric Morrow

Objective: To establish a population-based cohort of individuals with autism spectrum disorder (ASD).

Methods: Statewide recruitment was based on a unique public-private-academic collaboration involving all major points of service for families affected by autism in Rhode Island (RI). ASD symptomology was assessed based on direct, behavioral observation via the ADOS-2, as well as SRS-2 questionnaires.

Results: In the first 1,000 participants, ages ranged from 21 months to 64 years. The geographic distribution reflects strong depth of sampling in RI, with lowest recruitment in regions of lower socioeconomic status (SES). Notably, the overall sample is estimated at 39% of the pediatric-age persons in RI with ASD. There was a high concordance between a community diagnosis of ASD and research ASD classification on the ADOS-2 (90%). A major finding is the high rate of medical and psychiatric comorbidity: 74% reported co-occurring neurodevelopmental, psychiatric, or neurological conditions, while 93% reported at least one general medical condition. Remarkably, family psychiatric history was associated with overall severity of ASD in the proband.

Conclusions: Given the depth of sampling in one state, this large, population-based ASD cohort reflects an important resource for studying real world presentations of and interventions for ASD in a representative US population. Lower SES presents significant ascertainment challenges in ASD research and specific adjustments in recruitment strategies are needed to reach these important populations. Neuropsychiatric symptoms in people with ASD, as well as in family members, represent a substantial burden, as these symptoms are associated with ASD severity and treatment outcomes.

THE SCREENING UTILITY AND ECOLOGICAL VALIDITY OF THE NEUROPSYCHOLOGICAL ASSESSMENT BATTERY BILL PAYMENT SUBTEST IN OLDER ADULTS WITH AND WITHOUT DEMENTIA

Lauren Kenney, BS, Seth A. Margolis, PhD, Jennifer Davis, PhD and Geoffrey Tremont, PhD

The Neuropsychological Assessment Battery's Bill Pay subtest has shown strong diagnostic accuracy in Alzheimer Dementia (AD) vs. non-AD. Bill Pay's relationship to mild cognitive impairment (MCI) or all-cause dementia has not been fully examined nor has its ecological validity as a measure of financial independence.

This retrospective chart review describes 259 women (61%) and men (age=72±8.36 years) who completed Bill Pay during outpatient neuropsychological evaluation for suspected dementia. Sixty-eight were Cognitively Normal (CN), 152 had MCI, and 39 had Dementia. Two hundred five were independent in money management, 29 were assisted (had oversight/some help), and 25 were dependent (relied on others). Receiver operating characteristic (ROC) curves tested Bill Pay's utility as a dementia screen. Kruskal Wallis examined if Bill Pay differed by level of financial independence.

At a cut-off of 17, Bill Pay had strong sensitivity (0.87) and specificity (0.80) for Dementia vs. CN cases. A cut-off of 15 distinguished Dementia from both MCI and functionally unimpaired cases (MCI+CN) with equally strong specificity but weaker sensitivity (Sn=0.67, Sp=0.84 and Sn=0.67, Sp=0.89, respectively). Sensitivity attenuated even more in MCI vs. CN cases (Sn=0.46, Sp=0.84). Those who were independent in money management had higher Bill Pay scores (Md=18; M=17.10±0.44) than assisted (Md=17; M=15.38±4.35) and dependent cases (Md=17; M=15.8±3.20) (H's=35.16 and 38.25, respectively; p's≤0.046). Assisted and dependent cases were no different (p>0.05).

These results extend prior findings by showing that Bill Pay is a good screen of all-cause dementia. We also show that lower Bill Pay performance may mark subtle functional decline beyond cognitive impairment alone. Specifically, our results provide preliminary evidence of Bill Pay's ecological validity as a measure related to financial abilities. It may prove clinically useful when impaired financial abilities are suspected but unreported.

DEVELOPING NEW STRATEGIES TO ANALYZE EXERCISE-INDUCED QUIESCENCE IN C. elegans

Sarah Kim, Saba Baskoylu, Yuliang Guo, Thomas Serre, Anne Hart

Amyotrophic lateral sclerosis (ALS) is a fatal neurodegenerative disease. Mutations in the human FUS gene cause some cases of familial ALS, and our work investigates this gene's C. elegans ortholog, fust-1. To see if there is a behavior defect in worms with a patient allele fust-1 mutation, we ran exhaustion swimming assays. These exhaustion swimming assays are still in development by the Hart lab, and we ran these to determine if there is a difference in fatigue between the wild type worms and the fust-1 mutants. We then analyzed the behavior of the worms using computer vision software developed by the Serre lab, which outputs statistics about the quiescence of the animals. For the different statistics tested, there were some differences between the wild type worms and the fust-1 mutants, so further analysis must be done to determine the cause of this difference.

OPTOGENETICALLY INTERROGATING THE NEURAL REPRESENTATION OF VASCULAR DYNAMICS VIA INTRAVITAL NEUROVASCULAR IMAGING

Eric M. Klein, BS, Christopher A. Deister, and Christopher I. Moore

Understanding information and control signaling between cerebral blood vessels and neurons is important for many areas of science and medicine. These dynamics are often observed at the macro-scale in fMRI research as neurovascular responses to experimental stimuli. Although the spatial resolution of these techniques continues to improve, fMRI results are informative of hemodynamics rather than directly of the specific neural circuits controlling and responding to such dynamics. Advances in intravital fluorescent imaging methods have allowed for greater insight into micro-scale neurovascular interaction. Imaging of neurons though thinned-skull or cortical window implants in mice has been used in conjunction with stimulus presentation – most prominently somatosensory vibrissa stimulation, to study how neurons control cerebral blood vessels. The reciprocal effects that these blood vessels have on neural populations has generally been studied in the context of gating healthy-state hormonal signaling, or malfunction in disease-states such as stroke and ischemia. Investigation of normal neural representations of vascular dynamics is however largely understudied and will better illustrate how neural populations contribute to maintaining neurovascular homeostasis.

Here we present two-photon imaging methods to interrogate circuit-level neural activity as it responds to both sensory driven and optogenetically evoked vascular dynamics. This approach allows for both analysis of neural activity that naturally initiates the hemodynamic response, and analysis of neural activity that is affected by vasomotion resulting from direct vascular manipulation. Obstacles and solutions to using conventional LED-driven optogenetics in conjunction with two-photon imaging will be discussed. We also describe experiments utilizing two-color calcium imaging as a method to study the flow of physiological information between neurons and the cells of local cerebral blood vessels. These methods leverage vascular Cre-driver mouse lines in addition to viral transfection to cause the expression of both GCaMP6f and jRGECO1a genetically encoded calcium indicators in the vascular endothelium and local neural populations, respectively. Initial results demonstrate reliable control of cerebral blood vessel tone using optogenetic stimulation. Analysis of neural activity has revealed cellular activity that both leads and lags vascular dynamics in natural, optogenetic, or both conditions. Future directions include application of advanced de-mixing and deconvolution techniques for activity analysis, and analysis of cell morphology to identify neural cell-types of interest for circuit-level experiments.

DURING DAY AND NIGHT: CHILDHOOD PSYCHOTIC EXPERIENCES AND SLEEP PROBLEMS

Elize Koopman-Verhoeff, MSc, Koen Bolhuis, M.D., Ph.D., Charlotte A.M. Cecil, Ph.D., Maartje Luijk, Ph.D., Henning Tiemeier, M.D. Ph.D.

Background: Psychotic experiences compromise auditory and visual perceptive phenomena, such as hearing or seeing things that are not there, or delusional thoughts, in the absence of a psychotic disorder (Kelleher, Jenner, & Cannon, 2010). It is important to study childhood psychotic experiences because children, who report such symptoms in late childhood or early adolescence, have a 5 to 16 times higher risk for developing psychotic disorders in adulthood (Poulton et al., 2000). Studies using self- or mother-reported measures of sleep problems found that psychotic experiences co-occur with self-reported sleep problems (Jeppesen, Clemmensen, et al., 2015). Consistent with this, others report that psychotic experiences in adolescence often are preceded by severe nightmares in childhood (Fisher et al., 2014). While there is a rising interest in the role of sleep problems in the development of psychotic experiences, so far very few clinical studies and no population-based studies used objective measures of sleep to study this association. This study assessed whether psychotic experiences were associated with actigraphic sleep measures, symptoms of dyssomnia, nightmares, or other parasomnias.
Methods: This cross-sectional population-based study comprises 4149 children from the Generation R Study. At age 10 years, psychotic experiences including hallucinatory phenomena were assessed by self-report; dyssomnia and parasomnia symptoms were assessed by mother- and child-report. Additionally, in a subsample at age 11 years, objective sleep parameters were measured using a tri-axial wrist accelerometer in N=814 children, who wore the accelerometer for nine consecutive days (five school days and four weekend days). The analyses were adjusted for child's age, sex, ethnicity, gestational age, and maternal educational attainment and psychiatric problems.
Results: Psychotic experiences were not associated with objective sleep duration, sleep efficiency, arousal, or social jetlag. However, psychotic experiences and hallucinatory phenomena were associated with self-reported dyssomnia (respectively, B = 2.45, 95%CI: 2.13 to 2.77, p<0.001; B = 2.02, 95%CI: 1.69 to 2.40, p<0.001), mother-reported dyssomnia (respectively, B = 3.48, 95%CI: 2.48 to 4.89, p<0.001; B = 2.31, 95%CI: 1.59 to 3.35, p<0.001) and mother-reported parasomnia, specifically nightmares (respectively, ORadjusted = 3.59, 95%CI: 2.66 to 4.83, ORadjusted = 2.74, 95%CI: 1.99 to 3.78).
Conclusions: Childhood psychotic experiences were not associated with objective sleep measures. We found that psychotic experiences were consistently associated with subjective sleep problems across multiple raters. Consistent with this, we observed a dose-response association, whereby more child-reported psychotic experiences were associated with higher levels of mother-reported dyssomnia and parasomnia. Taken together, our findings suggest that in the general pediatric population psychotic experiences co-occur with multi-rated sleep problems and most strongly with nightmares. This finding can contribute to a broader understanding of the relationship between psychotic-like experiences and sleep. Additionally, it stresses the role of nightmares as a potential risk-indicator of psychopathology. More research is needed to shed light on the potential etiologic or diagnostic role of nightmares in the development of psychotic phenomena.

REGIONAL AMYLOID BURDEN IS ASSOCIATED WITH SENSORY BINDING DEFICITS WITHIN SEMANTIC MEMORY

Laura Korthauer, PhD, Lai, L.Y., Tremont, G., Ott, B.R., Heindel, W.C., & Festa, E.K.

Objective: Accessing semantic representations of real world objects requires binding of multimodal perceptual features represented across relevant neocortical areas. To the degree that AD pathology disrupts neocortical connectivity, individuals with AD will have difficulty binding perceptual features of objects. We have previously reported that patients with mild cognitive impairment (MCI) and dementia have a selective binding deficit for features of living, but not nonliving, objects (Korthauer et al., in prep). The present study investigated whether elevated genetic risk (APOE 4) and regional -amyloid burden are associated with deficient sensory binding in preclinical and prodromal AD.

Participants and Methods: Fourteen older adults (4 males; M age = 71.4 years) underwent APOE genotyping, cognitive testing, and Florbetapir PET -amyloid imaging. They were classified as cognitively normal (N = 5) or MCI (N = 9). Participants were presented living and non-living objects in typical or atypical colors. They made a yes/no color typicality judgment for each object. Proportional change in response time (RT) for atypically versus typically colored objects was the dependent variable; negative scores are a measure of greater sensory binding impairment.

Results: APOE 4 carriers and non-carriers did not differ in RT. After controlling for age and psychomotor speed, higher global SUVr was associated with greater slowing in response to atypically compared to typically colored objects, r = -.78, p = .003. This effect was observed for living, but not nonliving, objects. Region-of-interest analyses showed significant associations between SUVr and sensory binding across all measured brain regions, p's < .05.

Conclusions: In a sample of older adults with preclinical and prodromal AD, higher -amyloid burden was associated with sensory binding deficits for living objects, consistent with presumed disruptions to neocortical connectivity. Sensory binding deficits may be a potential cognitive biomarker to discriminate healthy from pathological aging.

SOCIAL ANXIETY AS A PRECURSOR FOR DEPRESSION: INFLUENCES FROM INTERPERSONAL REJECTION AND ATTENTION FOR EMOTIONAL STIMULI

Morganne Kraines, MS, Tony Wells

Background:
Social anxiety disorder (SAD) and major depressive disorder (MDD) are commonly comorbid conditions. Research suggests that SAD confers risk for later MDD (Wittchen et al., 2003). Cognitive models posit that biased cognitive processes (e.g., attention) are important for the development of SAD and MDD, but little research has examined how cognitive processes related to SAD may lead to MDD. Based on cognitive models of SAD and MDD, we hypothesized that interpersonal rejection would result in SAD symptoms being associated with more "depression-like" attention biases (increased attention to sad and decreased attention to happy stimuli).

Methods:
Participants were 164 young adults (M age=19.59, 67.1% female; 78% Caucasian). Participants completed a measure of SAD symptoms and an eye tracking task both before and after an experimental task in which participants were randomized to be either socially included or rejected. The eye tracking task examined sustained visual attention for sad, angry, disgust, happy, and neutral facial expressions over ten, 30-second trials.

Results:
SAD symptoms, inclusion or rejection condition, and the interaction term between SAD symptoms and inclusion/rejection condition were entered into a hierarchical linear regression predicting change in attention for each of the emotional face types. The overall regression model was significant only for sad faces ($R2=.13$, $p<.001$). However, rejection condition significantly moderated the effects of SAD symptoms on change in attention to sad, happy, and neutral faces. Specifically, SAD symptoms predicted increased attention to sad ($r=.33$, $p=.002$) faces and decreased attention to happy faces ($r=-.24$, $p=.025$) in the rejection condition but not in the inclusion condition. SAD symptoms predicted increased attention to neutral faces in the inclusion condition ($r=.261$, $p=.021$), but not in the rejection condition. There were no significant effects for angry or disgust faces.

Conclusion:
Results suggest that SAD symptoms are associated with more depression-like attention biases in the context of interpersonal rejection. This adds to current literature examining cognitive processes that may confer risk of MDD via SAD, and also contributes to literature examining the high comorbidity between MDD and SAD. Future longitudinal work will be important for establishing causal links between SAD symptoms, attention bias, and MDD.

EXPLORING NEUROPSYCHOLOGY'S ROLE AND PERCEIVED VALUE IN VA HOME-BASED PRIMARY CARE: A NATIONAL SURVEY

Jacob Lafo, PhD, Pamela Steadman-Wood, Ph.D., ABPP; Stephen Correia, Ph.D., ABPP

Background:
The VA Home-Based Primary Care (HBPC) program provides in-home interdisciplinary healthcare services for veterans with complex illness. Most veterans served by HBPC are at heightened risk for cognitive decline due to older age and the presence of multiple chronic health co-morbidities. This additive cognitive burden underscores the need for neuropsychological assessment in this population. Neuropsychological assessment involves fine-grained characterization of brain-cognition relationships which, in turn, map onto patients' functional status. Assessment results can guide treatment and care planning and delivery to optimize patient care, wellness, and quality of life. To our knowledge, neuropsychology services are offered in some, but not all HBPC programs, and, where offered, are implemented differently. A comprehensive evaluation of neuropsychology's role and perceived value in HBPC is warranted to further illuminate its value for improving standard of care for veterans, particularly for those who are home-bound and in greatest need of these services.

Significance:
According to a past survey of HBPC patient demographics, the typical HBPC patient is 76.5 years old and has, on average, eight or more chronic medical or psychological conditions (Beales et al. 2009). The synergistic impact of aging and vascular, metabolic, and psychiatric disorders on brain integrity and function results in increased risk for cognitive impairment and dementia in this population. Complementary behavioral and pharmacological strategies may have the greatest impact in slowing cognitive decline, optimizing patients' and caregivers' quality of life, and reducing the likelihood of untoward events such as hospitalization due to patients' cognitive errors (e.g., an inability to recall and follow complex medical instructions). Accordingly, neuropsychology is uniquely suited to assist other HBPC providers in developing cognitively-informed care plans and living arrangements to promote optimal safety and quality of life in non-institutional settings.

Aims:
The overarching goal of this project is to characterize the embeddedness and perceived value of neuropsychology services in HBPC programs nationwide via national survey. In view of this goal, our specific aims are: 1) To examine similarities and differences in neuropsychology service provision among HBPC programs, and 2) To determine how neuropsychology services enhance HBPC teams' approach to care and treatment planning for veterans and caregivers.

Approach:
This project will draw from methodologies used in past HBPC program surveys (e.g., Terry et al., 2017). The survey will be administered via a VA-version of REDCap, which will be distributed online to HBPC staff nationwide. The investigators will convene a multidisciplinary team of both HBPC and non-HBPC health care providers to take part in a focus group to develop survey questions. In accordance with the project aims, questions will solicit information addressing availability, provision, and training in neuropsychology services across programs and their perceived value among HBPC team members.

WIRELESS MICROIMPLANT NETWORKS FOR THE BRAIN

Farah Laiwalla, MD, PhD; Lee, Jihun; Nurmikko, Arto

Neuromodulation through electrophysiological access to neural microcircuits has emerged as one of the most efficacious modalities to interface with the nervous system, whether for brain-computer interfaces (BCI) or therapeutic intervention for neurodegenerative and neuropsychiatric indications (DBS). Vast parallelization of cortical access and improvement of the spatiotemporal resolution of neural interfacing are leading goals of current neuroengineering research. This work highlights one approach to addressing these challenges through development of fully autonomous neural microimplants which can be deployed into the brain as a spatially-distributed wireless network of neural recording and microstimulation devices. Each implant, called a "Neurograin" (NG) is developed around a microelectronic chiplet measuring 500um x 500 um x 35um (in its hermetically encapsulated implant-ready form), and contains the full neural signal acquisition, wireless energy harvesting and telemetry circuitry. Implants form a low latency, wireless time-domain multiple access (TDMA) network, providing electrocorticographic (ECoG) neural data as well as capabilities for patterned biphasic current microstimulation for up to 1000 simultaneous channels placed in the epicortical space. We demonstrate the technical and physiologic capabilities of prototype neurograin devices, leveraging ex-vivo brain slice epilepsy models to elucidate a bidirectional neural interface with these microimplants.

RELATIONSHIP BETWEEN PARENTS' BEHAVIORS AND MARITAL STATUS AND COLLEGE STUDENTS' EMOTION RECOGNITION AND REGULATION

Andrea Lapomardo, PsyD

Emotion regulation and emotion recognition abilities begin to develop in infancy and are considered fundamental to future growth and psychological functioning. These emotion-related competencies grow out of examples modeled by parents and are influenced by factors such as family stress, co-parenting behaviors, and interparental conflict. Structural changes within the family (i.e., parental divorce/separation) may be related to the degree to which these factors occur. Thus, it is important to consider the relationship between these changes and children's long-term emotion development.

Research on the topic of emotion recognition has highlighted a link between emotions exposed during childhood and capabilities to detect emotions later in life. However, no literature exists regarding the association between childhood parental divorce and future emotion recognition abilities. The present study aimed to fill the gap in the literature by examining the degree to which marital status and perceived parenting behaviors of parents was associated with emotion-related competencies in a sample of college students. To achieve this, 117 participants completed measures that assessed current emotion recognition abilities and emotion regulation difficulties as well as participants' perception of their parents' behaviors during childhood. Participants also reported information (e.g., marital status, structural changes) via a demographic survey.

Participants of divorced or not married parents reported significantly greater conflict between parents, more negative co-parenting behaviors, and less emotional availability of parents than participants whose parents were married. Participants whose parents divorced prior to age 10 were significantly better able to recognize negative emotions than those whose parents divorced at age 10 or older, while simply the experience of parental separation—with or without reunification—was significantly associated with recognition of positive emotions.

Results reveal a significant positive relationship between report of parental conflict and recognition of positive emotions. Emotional availability of both the mother and father and co-parenting behaviors of parents was significantly associated with certain components of emotion regulation and emotion recognition, and these associations were often gender-specific. This study offers an enhanced understanding of factors within the family that may be associated with children's emotional development. It also highlights important implications for clinical practice and points to areas of future study.

TBS-MODULATED ANGER IN VETERANS WITH PTSD

Victoria C. Larson, BS; Mascha van 't Wout, PhD; Emily M. Aiken, MA; M. Tracie Shea, PhD; Benjamin D. Greenberg, MD PhD; Noah S. Philip, MD

Background: Anger is recognized as an important clinical feature of posttraumatic stress disorder (PTSD) that can hamper recovery. Disruptions in brain regions associated with explicit emotion regulation, including the dorsolateral prefrontal cortex (dlPFC), are observed in PTSD. Transcranial magnetic stimulation (TMS) aims to improve PTSD-associated symptoms through non-invasive neural modulation. Here we examine whether intermittent theta-burst stimulation (iTBS), a novel TMS protocol, reduces self-reported anger in Veterans with PTSD.

Methods: Fifty Veterans with chronic PTSD received 10 daily sessions of sham-controlled, double-blind iTBS (1800 pulses/session) targeting the right dlPFC (intent-to-treat sample = 25 per group). All participants who completed the double-blind phase, were offered the option to receive another 10 sessions of unblinded iTBS. Participants completed the Dimensions of Anger Reactions scale at baseline, midpoint and endpoint of both double-blind and open-label phases, and at one-month follow-up.

Results: Repeated measures analyses revealed a significant reduction in self-reported anger over time across groups (p=0.001). During the double-blind phase only, participants randomized to active iTBS reported less anger at midpoint (p=0.02) and a trend towards less anger at endpoint (p=0.07) compared to participants randomized to sham. Participants initially randomized to sham showed a significant reduction in self-report anger once they received active iTBS during the open-label phase (p=0.002). A partial least squares regression demonstrated that the reduction in anger occurred in tandem with reductions in PTSD and depressive symptom severity, but was unrelated to improvements in quality of sleep.

Conclusions: These results suggest that iTBS reduces anger–together with reductions in PTSD and depressive symptoms– in Veterans with PTSD. Future studies focused on granular level anger outcomes are needed.

IDENTIFYING SECOND-TIMESCALE NEUROPHYSIOLOGICAL BIOMARKERS OF PARKINSON'S DISEASE

Peter Lauro, BA; Shane Lee, Minkyu Ahn, Wael Asaad

Introduction:
Parkinson's disease (PD) is a neurodegenerative disease characterized by motor symptoms such as tremor, bradykinesia, and postural instability. Deep brain stimulation (DBS) is a therapeutic intervention that helps relieve symptoms while reducing medication-related side effects. DBS, often targeting the subthalamic nucleus (STN), is administered in an 'open-loop' fashion, where clinically titrated settings are applied continuously without regard to a patient's symptomatic state. However, inappropriate stimulation can lead to suboptimal symptom relief and side effects. Closed-loop DBS, where stimulation is administered in response to a control signal, has the promise to better treat symptoms while reducing side effects and battery consumption. To elucidate PD and patient-specific neurophysiological control signals, we quantified motor symptoms with a continuous motor performance task while simultaneously acquiring intracranial recordings.

Methods:
Twenty-two patients with PD undergoing DBS surgery performed a continuous motor performance task during routine intraoperative neurophysiological mapping of the subthalamic nucleus (STN). Patients performed the task by using a joystick to track an onscreen cursor moving in one of several fixed patterns. Eight motor metrics were calculated from subject and/or target traces in 100 ms or 1 second non-overlapping epochs. Patient metrics were compared to those from fifteen age-matched controls. A linear support vector machine (SVM) was used to calculate a hyperplane between patients and controls, and each patient epoch's normal distance from the hyperplane was calculated as symptom score (SS). Microelectrode recordings (MER) were acquired from patients during the task from 3-4 electrodes 2 mm apart. Recordings were downsampled to 1000 Hz, high-pass filtered at 3 Hz, and Hilbert-transformed. To quantify neurophysiological signals corresponding to patient-specific PD symptom expression, we organized 1 second neurophysiological data epochs from each electrode by SS. We then compared the power of five canonical bands (theta/alpha, beta, low/medium/high gamma) in epochs above and below the SS median using a non-linear SVM with a radial basis function kernel.
To understand neurophysiological classification accuracy as a function of anatomy, we reconstructed MER locations with clinical imaging (MRI, CT) and mapped them to a common MNI atlas space.

Results:
A linear SVM using 8 motor metrics in 100 ms epochs was able to separate control and patient populations with an accuracy of 80.6±0.1%. SS resulting from this SVM were autocorrelated within each population, with controls and patients showing a half-maximum value at 162 ms and 1.24 seconds respectively. A linear SVM with 1 sec windows was able to separate populations with an accuracy of 85.4±0.5%.
Patient and electrode-specific neural SVMs were able to distinguish between high- and low-symptomatic 1 second epochs with an accuracy of 65.1±6.0%. Electrodes with the highest neural classification accuracies per patient were located in the dorsolateral STN (x : +12.9, y : +11.8, z : −6.3), while electrodes with the lowest classification accuracies were located more ventromedially (x : +12.6, y: +11.3, z : −6.5).

Discussion:
Our approach has demonstrated the ability to reliably distinguish task performance between patients with PD and age-matched controls on second timescales. Using SS to organize neurophysiological signals has revealed that low- and high-symptomatic states can be distinguished in a patient-specific fashion. Future work will focus on examining shared neural signals of specific symptoms, and advanced machine learning techniques such as artificial neural networks. Future experiments will sample from the entire STN as patients perform the task, and use patient-specific neurophysiological control signals to deliver stimulation as patients perform the task.

RELIABILITY OF A RAPID APOE ASSAY FOR ALZHEIMER'S RISK ASSESSMENT AND CLINICAL TRIAL SCREENING

Athene Lee, PhD, William Menard, BA , Gina Tonini, MBA, Louisa Thompson, PhD, Jessica Alber, PhD, Stephen Salloway, MD

Background: High screen fail rate on amyloid PET in Alzheimer's disease (AD) prevention trials is cost prohibitive and delays the discovery of effective therapeutics. Apolipoprotein (APOE) ε4 carriers are at higher risk for AD and tend to accumulate brain amyloid at an earlier age. Pilot data from the Butler Alzheimer's Prevention Registry shows a reduction in screen fail rate from 81% to 57% by enriching trials with ε4 carriers. This finding supports the use of APOE genotyping to screen potential participants in our registry; however, typical Clinical Laboratory Improvement Amendment (CLIA) certified laboratory testing requires batch processing and has a turnaround time of at least 1-2 weeks. The Spartan Cube APOE system is a rapid, on-site genotyping analysis method that may potentially improve screening efficiency, yet the reliability of this method is not well established.

Objectives: This study examines the reliability of a new on-site APOE genotyping analysis method (Spartan Cube) and evaluates the potential application in our registry to expedite screening and enrich AD prevention trials with high risk individuals.

Methods: Seventy one older adults with known APOE genotype from the registry consented to this reliability study. All participants had already received their CLIA certified APOE results from a clinician through an APOE disclosure study. The CLIA results were based on buccal swab samples and analyzed in two laboratories. Fifty six samples were processed with a polymerase chain reaction (PCR) Taqman assay, and fifteen were processed with a PCR amplified bi-directional Sanger di-deoxy sequencing.

A second buccal swab was conducted to determine the reliability of the Spartan Cube. The participants were informed that the Cube is for research use only and that they would not receive their results from this reliability study. The Cube is a portable device connected to a laptop that provides step-by-step on-screen instructions to run the test and displays the APOE genotype upon test completion. To determine APOE genotype, two buccal samples were collected from each individual by trained Butler staff. The samples were then inserted into the APOE test cartridge which contained all necessary reagents for DNA extraction, PCR amplification, and fluorescence-based detection of the APOE ε2, ε3 and ε4 alleles. The samples were run either immediately or up to 72 hours after collection, and the reaction took ~60 minutes to complete.

Intraclass Correlation Coefficient (ICC) estimate and its 95% confident intervals were calculated based on a single-rating, absolute-agreement, 2-way randomized-effects model.

Results: Participants had a mean age of 66.9 and 16.8 years of education on average. 65% were females and 98% were Caucasians. None of the participants had a prior cognitive diagnosis. Mini-mental status examination scores ranged from 27 to 30. Based on the CLIA certified APOE genotyping, 32% of the 71 participants were ε4 carriers (6 ε2/ε3, 42 ε3/ε3, 23 ε3/ε4). Using the Cube APOE system, 71 samples were successfully run. Out of the 71 pairs of APOE results, there was 100% concordance between the CLIA certified laboratory and the Cube. ICC estimate was 0.95, with 95% confidence intervals of 0.91-0.97.

Conclusion: The results indicate that the Spartan Cube APOE system has excellent reliability when compared to the CLIA certified gold standard. While clinical disclosure of APOE genotype should still require confirmation from a CLIA certified laboratory, this new portable device provides clinicians and researchers an alternative way to rapidly identify ε4 carriers for AD prevention trials. In the case of a registry with a long wait time to trial screen, rapid APOE genotyping can help prioritize individuals with higher risk which may reduce screen fail rates. At the clinic level, clinicians may use rapid APOE genotyping to complement consultation results and to triage patients to appropriate trials.

THE EFFECTS OF SUBJECTIVE COGNITIVE DECLINE ON APOE GENOTYPE DISCLOSURE IN THE BUTLER ALZHEIMER'S PREVENTION REGISTRY

Athene Lee, PhD; Louisa I. Thompson, Meghan K. Collier, Danielle Goldfarb, Brittany Dawson, Stephen P. Salloway, Jessica Alber

Background: Alzheimer's disease (AD) prevention trial recruitment targets healthy older adults at high risk for AD. Common risk measures include the presence of subjective cognitive decline (SCD) or the apolipoprotein (APOE) ε4 allele. Understanding the relationship between SCD and the impact of APOE disclosure has implications for the psychological wellbeing and health behaviors of trial volunteers. This study investigates how SCD associates with other participant characteristics and whether SCD interacts with APOE genotype to effect emotional impact of APOE disclosure over time.

Methods: 955 individuals have joined the Butler Hospital Alzheimer's Prevention Registry. A subgroup of 67 healthy adults (aged 59-77) completed a pre-APOE genotyping assessment (psychological interview, Montreal Cognitive Assessment (MoCA)), genetic disclosure, and two follow-ups (3 days, 6 weeks). Baseline variables of interest included education, first-degree family dementia history, psychiatric history, and perceived risk of AD. Mood measures included self-reported depression, anxiety, and impact of events scales (IES). All variables were compared across 3 groups at baseline: no SCD (no cognitive concerns, n=30), SCD (cognitive concerns, MoCA≥26, n=22), and mildly impaired (MoCA<26, n=15). The interaction effect between SCD (no SCD, SCD, mildly impaired) and APOE genotype (ε4-carriers, non-carriers) on mood measures and perceived risk of AD over time were computed using a mixed model RMANOVA design.

Results: Among all 955 registrants, 55% reported SCD and 37% have been treated for depression or anxiety. Individuals with SCD are more likely to report a history of depression or anxiety (42% vs. 30%). Among those who completed APOE genotyping, the three groups (no SCD, SCD, mildly impaired) showed no difference in baseline characteristics or mood measures, with the exception of relatively lower education in the mildly impaired group (p<0.05), which was controlled for in subsequent analyses. Following APOE disclosure, there was a significant SCD by APOE genotype interaction on IES (p<0.05), such that ε4-carriers with SCD and non-carriers with mild impairment scored higher on IES than other groups. However, this difference dissipated with all groups reporting low IES at both follow-ups. There were no significant interaction effects on other measures.

Conclusions: These findings suggest that baseline SCD heightened the acute emotional impact of APOE disclosure for ε4-carriers. Interestingly, individuals with mild impairment on cognitive screening showed stronger emotional reaction to the disclosure of non-ε4 vs. ε4 status, possibly due to a dissonant effect. As good clinical practice, the presence of SCD should be taken into consideration when disclosing APOE risk to prevention trial candidates.

CHRISTIANSON SYNDROME: A NOVEL ENDOSOMAL DISORDER WITH NEURODEGENERATION

Eugene Lee, PhD, Eric Morrow

Genetic discoveries in neurodegenerative diseases have provided crucial insights into the cellular mechanisms of these diseases and offer the opportunity to create new animal models. Mutations in proteins functioning in the endo-lysosomal system have been associated with many neurodegenerative diseases, suggesting that the endo-lysosomal system may serve as a therapeutic target for these diseases. Loss-of-function mutations in the endosomal Na+/H+ exchanger 6 (NHE6, encoded by SLC9A6) in males cause Christianson syndrome (CS), a "mixed" disorder involving both neurodevelopmental and neurodegenerative pathology. To this end, our previous data and other studies in the field have reported widespread reduction of brain volume, axonal degeneration, cerebellar degeneration, and pathological tau deposition in CS. Specifically regarding neurodegenerative pathology, NHE6 has been implicated in Alzheimer's disease (AD)-related pathology, most notably, tau deposition in adult males, as assessed in postmortem brain. Additionally, we have recently identified female mutation carriers with adult-onset neurodegenerative disease. However, a major obstacle in the field is that mouse models do not recapitulate key neurodegenerative or behavioral aspects of disease, including tau pathology. Thus, research in new animal model systems closer to human physiology will help us to better understand the neurodegenerative pathology in this disorder.

DIFFERENTIAL TREATMENT OUTCOMES OF ADOLESCENTS AND PARENTS IN DIALECTICAL BEHAVIOR THERAPY FOR ADOLESCENTS

Katherine L'Esperance, PsyD; Janine Galione, PhD; Karyn Horowitz, MD; Kerri L. Kim, PhD

Dialectical Behavior Therapy for Adolescents (DBT-A) is the first well-established treatment for recurrent suicidality and non-suicidal self-injury (NSSI) in youth (McCauley et al., 2018). In contrast to the adult model (Linehan, 1993), Miller and colleagues (1997, 2007) adapted DBT for adolescents by tailoring treatment to address typical parent-teen relationship challenges, involving parents in weekly skills training groups, and reducing length of treatment. Despite the integral involvement of parents in DBT-A, treatment outcomes of parents as compared to those of adolescents have not yet been examined. In this study, we aim to replicate findings for adolescent outcomes following completion of an outpatient DBT-A program. We also aim to extend the literature by assessing for change in parent report of their own functioning.

Participants from ages 13 to 18 and at least one legal guardian were enrolled in an 18-week, full-model DBT-A program. Adolescents were admitted to the program if they presented with a history of suicidality, NSSI, or other self-destructive behaviors. Prior to and immediately following treatment, adolescents and their parents completed a battery of questionnaires measuring a range of affective symptoms and psychosocial features. Adolescents completed the Borderline Symptom List (Bohus et al., 2007), Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004), Beck Depression Inventory-2nd Edition (Beck et al., 1996), Beck Anxiety Inventory (Beck & Steer, 1993), and DBT Ways of Coping Checklist (DBT-WCCL; Neacsiu et al., 2010). Parents completed the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) to report their observation of mental health symptoms in their adolescent. They also completed the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) to report their own experience of mental health symptoms, and the DBT-WCCL to report their own use of coping skills. Data collection is ongoing, thus sample sizes varied and ranged from N=33 to N=42.

Adolescent and parent self-report were compared from pre- to post-treatment using paired-samples t-tests. Results indicated that adolescents reported significant reduction in emotional dysregulation (t(41)=6.84, p<.01), depression (t(37)=4.39, p<.01), and borderline personality disorder symptoms (t(39)=4.48, p<.01) from pre- to post-treatment, as well as increased use of adaptive coping skills (t(40)=-4.64, p<.01), though reported no significant reduction in anxiety symptoms (t(39)=1.41, p=.12). Additionally, results demonstrated that parents reported significant reduction in the mental health symptoms of their adolescent children as measured by the CBCL Internalizing (t(34)=6.21, p<.01), Externalizing (t(34)=3.79, p<.01), and Total Problems (t(32)=6.11, p<.01) scales. Findings showed parents reported a significant increase in their own use of adaptive coping skills (t(39)=-4.60, p<.01), though did not report significant reduction in their own depression (t(39)=1.70, p=.10), anxiety (t(39)=.18, p=.86), or overall mental health symptoms (t(39)=.11, p=.92) as measured by the BSI Depression, Anxiety, and Total scales.

Findings from the present study offer preliminary evidence that DBT-A may be effective in improving adaptive coping ability in parents. Results indicating that parents did not report a reduction in their own mental health symptoms may reflect the low level of symptom endorsement overall, such that parents did not report mental health symptoms in the clinical range at pre- or post-treatment. In addition, findings are consistent with the literature identifying DBT-A as effective for reducing a variety of mental health symptoms for adolescents per parent and teen report. To further understand the impact of parents' use of adaptive coping skills, studies should broaden assessment of parent functioning pre- and post-treatment with consideration of the transaction between parent and adolescent coping and symptom presentation.

INTRAVENOUS ADMINISTRATION OF GHRELIN INCREASES SERUM CORTISOL AND ALDOSTERONE CONCENTRATIONS IN HEAVY-DRINKING ALCOHOL-DEPENDENT INDIVIDUALS: RESULTS FROM A DOUBLE-BLIND, PLACEBO-CONTROLLED HUMAN LABORATORY STUDY

*Victoria Long, BA; Mehdi Farokhnia, Molly Magill, George A. Kenna, Robert M. Swift,
Lorenzo Leggio and Carolina L. Haass-Koffler*

Increasing evidence supports the role of appetite-regulating hormones, including ghrelin, in alcohol use disorder (AUD). Here we tested the hypothesis that intravenous administration of ghrelin leads to an increase in endogenous serum cortisol and aldosterone concentrations, and that these changes may predict ghrelin-induced alcohol craving. Also, the effects of ghrelin on cortisol and aldosterone concentration has been observed in ghrelin-exposed tissues or cells, rodents and healthy volunteers. This was a double-blind, placebo-controlled human laboratory study in non-treatment-seeking, heavy-drinking alcohol-dependent individuals randomized to receive either placebo, 1mcg/kg or 3mcg/kg of intravenous ghrelin. Then, participants underwent a cue-reactivity procedure in a bar-like setting, which included exposure to both neutral (juice) and alcohol cues. Repeated blood samples were collected and used to measure endogenous cortisol and aldosterone serum concentrations in response to exogenous ghrelin administration. Furthermore, cortisol and aldosterone serum concentrations were used to develop a model to predict the effect of exogenous ghrelin administration on alcohol craving. Intravenous ghrelin administration increased endogenous cortisol and aldosterone serum concentrations. Although the effects on cortisol were greater than those on aldosterone, only the ghrelin-induced changes in aldosterone serum concentrations predicted alcohol craving. These findings provide preliminary evidence of ghrelin effects on glucocorticoids and mineralocorticoids in the context of alcohol of evaluating new targets for developing therapies for alcohol use disorder.

HUMAN NEURONS FROM CHRISTIANSON SYNDROME iPSCs REVEAL ALLELE-SPECIFIC RESPONSES TO RESCUE STRATEGIES

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Induced pluripotent stem cells (iPSCs) represent an important resource for mechanistic studies and therapeutic development. Christianson syndrome (CS) is an X-linked neurological disorder caused by diverse mutations in SLC9A6, the gene encoding the endosome-localized Na+/H+ exchanger 6 (NHE6). Phenotypes of CS include impaired cognitive development, seizures, autistic features, and attenuation of brain growth postnatally (postnatal microcephaly). No therapeutic treatments currently exist to directly treat CS.

Use of a human neuronal cell model would be advantageous to aid in the study of mechanisms of disease and the development of treatments for CS. To this end, we developed CS iPSC lines from patients with various mutations in SLC9A6 (nonsense and missense), as well as robust biologically related and isogenic controls. We demonstrate that mutations in CS lead to loss of protein function by a variety of mechanisms. Regardless of mutation, all patient-derived neurons demonstrate reduced neurite growth and arborization, likely underlying diminished postnatal brain growth in patients. Importantly, phenotype rescue strategies show allele-specific responses: a gene replacement strategy shows efficacy in nonsense mutations but not in a missense mutation, whereas application of exogenous trophic factors (BDNF or IGF-1) rescues arborization phenotypes across all mutations.

Our data emphasize that mechanistic classes of patient mutations are a critical consideration in treatment development regarding genetic diseases.

ACCEPTABILITY AND USABILITY OF A MOBILE APP TO HELP INCREASE PHYSICAL ACTIVITY IN ALCOHOL DEPENDENT PATIENTS

Eliza Marsh, BA, C.E. Blevins, C.L. Battle, J.A. Desaulniers, M.D. Stein, A.M. Abrantes

Purpose: Alcohol use disorder (AUD) is a significant public health concern. Interventions focused on increasing physical activity (PA) may improve overall AUD treatment outcomes. Given the accessibility of smartphones and activity trackers, integrating this type of technology into a mobile app may be an acceptable and useful approach to increase PA and decrease the probability of relapse in early recovery among those with AUD. To our knowledge, there are no tailored PA apps for AUD. We conducted an open pilot trial with AUD patients in early recovery leaving partial hospitalization, to assess the acceptability and usability of the Fit&Sober app. Methods: The Fit&Sober smartphone app integrates with a Fitbit activity tracker such that tracker-based steps/day and minutes/week is displayed on the Fit&Sober dashboard. The app provides participants with PA and relapse prevention resources; personalized feedback on the relationship between affect/cravings and PA engagement; and tracks days of sobriety; and "points" for various levels of engagement with the app. Usability of the app was determined by participants' self-report on the System Usability Scale (SUS). Acceptability of the app was measured by frequency of app use (i.e., days app was used) as well as satisfaction with the app using the Client Satisfaction Questionnaire (CSQ-8). Results: Participants were recruited from Butler Hospital's Alcohol and Drug Treatment Partial Program (N = 22; 59% female, mean age = 43.6). The Fit&Sober app was installed on participants own smartphones and they were instructed to use the app for 12 weeks. The mean SUS score indicated high usability (mean score of 70.2). Participants reported using the app an average of 70% of the days during the 12-week study. Participants also reported a high level of satisfaction with the Fit&Sober app (mean score of 27.3 on the CSQ-8, SD = 3.2). Conclusions: The results of this study demonstrate the acceptability and usability of the Fit&Sober app. Patient with AUD who were in early recovery reported high satisfaction with the app. A randomized controlled trial is underway to determine the efficacy of the Fit&Sober app on the long-term maintenance of PA, as well as mental health and alcohol outcomes.

CYBER PROXIMITY: POSSIBILITIES TO RECREATE PHYSICAL CO-LOCATION OF MENTAL HEALTH AND PRIMARY CARE THROUGH TECHNOLOGY

Stephen Matsko, PhD

The movement towards integrated mental health and medical care has created a perceived need for co-location, which has been shown to have benefits. These include increased referral rates, reduced wait-times, reduced stigma for patients, an eased burden on primary care clinicians to treat mental health independently, and increased patient engagement. However, there are often numerous barriers to co-locating for many providers such as regional shortages of mental health providers, lack of physical office space, lack of shared medical records, conflicting reimbursement procedures, and a lack of initiative to integrate among providers. One possible solution to over come some, if not most of these barriers is to create virtual networks that have the ability to draw on the active ingredients that have been shown to make co-location beneficial. By creating cyber proximity between clinical providers, care can be better-integrated independent of physical distance and open a world of possibilities for future growth.

UNCOVERING CHROMATIN ACCESSIBILITY ALTERATIONS IN NEURAL STEM CELL ACTIVATION

Sun Maybury-Lewis, BS, Shleshma Dhakal, Brendan McCarthy-Sinclair, and Ashley Webb

Neural stem cells (NSCs) are the source of new functional neurons in the adult mammalian brain (1). Evidence in rodents indicate that adult-born neurons integrate into the circuitry that supports cognitive functions such as learning and memory (1-3). In vivo, vast majority of NSCs reside in a state of quiescence and maintain the ability to reenter the cell cycle. Upon activation by intrinsic and extrinsic cues, NSCs begin to proliferate and either return to quiescence (self-renewal) or differentiate into neurons, astrocytes, or glia. Transcriptome profiling experiments performed by our lab and others revealed that global transcriptional changes take place with NSC activation (4-5). Currently, the precise molecular mechanisms underlying NSC quiescence and activation are unknown. To interrogate the chromatin-level mechanisms underlying NSC activation, we performed a comprehensive analysis of chromatin accessibility dynamics during NSC activation in primary mouse NSCs using ATAC-seq (Assay for Transposase-Accessible Chromatin) (6). We found that quiescent and activated NSCs share a lineage-specific accessible chromatin profile. In contrast, in genomic regions associated with differential expression between quiescent and activated NSCs, chromatin accessibility is markedly changed. Interestingly, gain and loss of chromatin accessibility are both associated with increased and decreased gene expression, highlighting the complexity underlying transcriptional regulation of the genomic network supporting neurogenesis. Furthermore, we found that sites that gain or lose chromatin accessibility with NSC activation reside largely in distal intergenic regions, and harbor active cis regulatory DNA enhancer elements. Finally, these dynamic chromatin regions are enriched with major NSC-regulating factor binding, specifically by ASCL1 and NFI (Nuclear Factor I). Our results reveal that chromatin regions of dynamic accessibility play a crucial role in NSC transcriptional regulation, and suggest that a transcriptional program driven and fine-tuned by enhancers is critical for stem cell homeostasis in adult tissues. In ongoing analysis, we are investigating the transcriptional networks that govern NSC quiescence, and how they function with the dynamic accessibility in NSC chromatin during activation.

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WHAT IS THE ROLE OF MENTAL HEALTH PROVIDERS IN THE TREATMENT OF WOMEN WITH POSTPARTUM SEXUAL DYSFUNCTION?

Laura Mayer, MD; Cynthia Battle, PhD

Objective: During the postpartum period, women often struggle to return to their pre-pregnancy sexual functioning, and may experience significant changes in their physical, mental and emotional well-being as a result. Empirical studies have identified several factors associated with postpartum sexual dysfunction, including dyspareunia, perineal trauma, breastfeeding, vaginal delivery, and mental health disorders, including depression and anxiety. Many times, women experiencing postpartum sexual problems do not have discussions with their primary OB providers about these changes, and this may impact their return to a sexually satisfying life, impact their relationships, and potentially exacerbate postpartum depression and anxiety. This poster will (1) provide an overview of postpartum sexual functioning problems, (2) summarize literature addressing the emotional and psychosocial impact of these problems, and (3) discuss the potential role mental health providers in identifying and treating women experiencing sexual functioning problems after having a baby.

Methods: A PubMed literature search was conducted to identify published English language studies addressing the course, predictors, assessment, and treatment of sexual dysfunction in the postpartum period, as well as literature addressing patient-provider communication on the topic, and psychosocial intervention programs that may be applicable in mental health settings.

Results: The current literature suggests that although women are often not informed about changes in sexual function that take place during the postpartum period, such problems are common and impact up to 83% of new mothers. Recent findings also suggest that problems in sexual functioning in the postpartum period, can lead to long-term effects on sexual health, relationships with intimate partners, and worsening of mood and anxiety symptoms. We found very limited literature regarding the specific role of mental health providers in addressing women's difficulties with postpartum sexual functioning. Additionally, several studies highlight significant gaps in accurate screening and assessment of sexual functioning problems during OB and mental health visits. Assessment of sexual functioning by prescribers is particularly important since some pharmacological agents prescribed to treat depression and anxiety (SSRI's), can have adverse effects on sexual functioning (lowered libido, anorgasmia) in over 50% of patients. To date, there are only a small number of interventions developed to address the functional and psychosocial impact of postpartum sexual problems; however, some existing forms of treatment (interpersonal therapy, physical therapy, partner education) may be beneficial.

Conclusions: Mental health providers can play an important role in assessment and treatment of postpartum sexual dysfunction, particularly in light of the fact that contact with OB, and other healthcare providers, is limited after the standard postpartum check-up. There is an opportunity for mental health providers to play a key role in identifying whether or not difficulties exist with a woman's sexual functioning, and if so, how this may be affecting her mental health. Development of new strategies for assessment and intervention, and greater awareness of these problems can help guide more effective treatment, and possibly change prescribing practices.

MINDFUL MOTHERS: STUDY DESIGN AND SAMPLE CHARACTERISTICS OF A RANDOMIZED CONTROLLED TRIAL OF ONLINE MINDFULNESS BASED COGNITIVE THERAPY FOR PERINATAL WOMEN AT RISK OF DEPRESSIVE RELAPSE

Christina Metcalf, MA; Cynthia Battle, Sona Dimidjian

Objective: Mindfulness based cognitive therapy (MBCT) is an efficacious intervention designed to prevent depressive relapse in currently well populations who have a history of recurrent depression. Limited research has tested the extent to which MBCT engages putative targets and produces differential target change versus control conditions. This trial is design to test the extent to which psychological processes—self-compassion and decentering—significantly and differentially improve within digital MBCT customized specifically for pregnant and postpartum women (Mindful Mood Balance for Moms; MMB for Moms) versus Wait List Control (WLC) group. The study design and sample characteristics of this randomized controlled trial are reviewed herein.

Methods: We randomized 60 pregnant or postpartum women with a history of major depression and current residual depressive symptoms to MMB for Moms or WLC. Inclusion criteria included being 1) female, 2) pregnant or having had a child within the past 36 months, 2) 18 years of age or older, 3) having a history of one or more prior MDE, and 4) a current PHQ-9 score of < 15. Exclusion criteria include 1) meeting criteria for a current MDE (as assessed by a PHQ-9 score of >= 15), 2) current imminent suicidality (as assessed by a > 0 response to the PHQ-9 suicidality question), and 3) indication of other disorders or symptoms that necessitate priority treatment. Interested potential participants were directed to a REDCap website with study details and an online questionnaire with prescreening questions. Participants who meet prescreening criteria were provided with an online informed consent form through REDCap, given the option to enroll in the study, completed baseline questionnaires, and were then randomized. Every other week after randomization for the 12-week intervention window, participants will be emailed a REDCap link to decentering, self-compassion, depression, and anxiety symptoms questionnaires. Twelve weeks post-randomization, participants will be emailed a questionnaire regarding depressive relapse in the past 3 months. We aim to compare change over time between groups on self-reported depression symptoms, self-compassion, and decentering using Hierarchical Linear Models (HLM) as our primary analytic model. We predict the rate of change in depression, self-compassion, and decentering across the study will be greater on average for participants randomized to MMB for Moms course relative to participants randomized to the WLC group.

Sample Characteristics Results: Participants were on average in their late 20s or early 30s (M=30.88, SD=3.88), White (93.33%), Non-Hispanic (95.00%), college educated (50.00%), employed full time (63.33%), and making less than 99k a year in total household income (75.00%). One fourth of the sample was pregnant (26.67%), on average in the second trimester of pregnancy (M= 22.56 weeks, SD=9.41). Most participants had children under 3 years old (88.33%)—most participants had just one (48.33%) or two children (28.33%) total. Participant depressive and anxiety symptom severity at enrollment were in the mild range, on average (PHQ-9 M=6.92, SD=3.39; GAD-7 M=8.48, SD=4.45). Some participants were engaged with contemplative practices (yoga, 26.67%; meditation, 10.00%) and psychiatric care (psychotherapy, 21.67%; psychiatric medications, 35.00%) at the time of enrollment. A previous diagnosis of an anxiety disorder was common in the sample (61.70%). Some participants endorsed being previously diagnosed with posttraumatic stress disorder (10.00%), obsessive compulsive disorder (8.30%), panic disorder (5.00%), eating disorder (3.30%), drug addiction (5.0%), alcohol addiction (1.70%). More than half of participants endorsed previous psychiatric treatment: some participants endorsed using psychiatric medications (66.70%), psychotherapy (56.70%), running or physical activity therapy (15.00%), or psychiatric hospitalization (6.70%) in the past.

INVESTIGATING THE ASSOCIATION BETWEEN EMOTION REGULATION AND SUBSTANCE USE IN A SAMPLE OF AT-RISK EARLY ADOLESCENTS

Crosby Modrowski, MS; Chris Houck PhD

The period of early adolescence represents an ideal time to intervene with youth at-risk for evidencing health risk behaviors, including risky or unsafe sexual behaviors, substance use, and aggression. Of the research that focuses on individual factors associated with health behaviors, one construct that has been consistently shown to be associated with health risk behaviors is emotion regulation (Houck et al., 2016). The Talking about Risk and Adolescent Choices (TRAC) intervention was designed to target sexual-risk behaviors in early adolescents by improving emotion regulation (ER). Research has demonstrated that this intervention is associated with decreased sexual risk behaviors over time (Houck et al., 2016, 2018), but it is unknown whether participation in the TRAC intervention was associated with other risk outcomes, such as substance use. Therefore, this study tested the hypotheses that participation in the TRAC intervention would be associated with lower risk for substance use over time, as would higher levels of emotional awareness, perceived access to ER strategies, and the number of ER strategies youth reported.

Participants were 420 youth (53% boys) who participated in a larger intervention study. Youth were recruited from urban public-school districts and were eligible if they were in the 7th grade, spoke English, were 12-14 years old, and were at risk due to emotional or behavioral problems. Youth were randomized into one of two conditions: Health Promotion (HP) or Emotion Regulation. The HP intervention provided education about health topics and encouraged youth to engage in health-promoting behaviors. The ER intervention enhanced ER by providing education around identifying and labeling emotions, recognizing "triggers," and developing appropriate ER strategies. Adolescents completed two subscales of the Difficulties in Emotion Regulation Scale (DERS; Awareness and Access to Strategies), a checklist of ER strategies taught in the intervention, and self-reports of alcohol, marijuana, and other drug use. The DERS was scored such that higher scores indicated more difficulties with ER (i.e., more emotion dysregulation). We conducted a series of generalized estimating equations (GEE) to determine whether emotional awareness, perceived access to ER strategies, and the number of ER strategies were associated with substance use over time, and whether this differed by intervention condition. Results demonstrated that emotional awareness (B = .06, p < .001) and access to ER strategies (B = .08, p < .001) were associated with substance use. There was no relation between the use of ER strategies and substance use. Although there was not a main effect of intervention condition, results showed a significant interaction between time and condition such that youth in the ER condition were more likely to use substances over time (B=.03, p=.02).

Results of this study demonstrated that participation in the ER group did not protect against future substance use. However, results showed that difficulties with ER was associated with an increased risk for substance use over time. These findings align with previous research suggesting an association between ER functioning and substance use (Kober, 2014). Future research may benefit from further investigating ER and substance use risk in other samples of early adolescents in order to better understand the association between self-reported emotion regulation and substance use in early adolescents.

TRISOMY 20 AND MITIGATION IN CAPITAL CRIMES SENTENCING: A REVIEW AND CASE REPORT

Rose Montplaisir, BS, Erica Lee, Daniel De Luca Moreno, Wade Myers

Trisomy 20 is a genetic abnormality in which individuals have an extra copy of chromosome 20. Complete trisomy 20 is rare and believed to be incompatible with life. A mosaic form of Trisomy 20 mosaicism, in which only some cells contain the extra chromosome, is a relatively commonly encountered chromosomal abnormality found during prenatal testing, and approximately 90% result in a normal phenotype. However, despite there being no reliable phenotype, certain findings that have been reported across multiple cases of mosaic trisomy 20. These include an array of morphological findings, developmental delays, and learning disabilities. These recurring physical findings include subtle facial characteristics such as low-set ears and the presence of epicanthal folds. Cardiac anomalies are also frequent, and range from ventricular septal defect to transposition of the great vessels to pulmonary atresia. Other commonly reported findings include hypotonia, lifelong constipation, sloped shoulders, and spinal abnormalities such as kyphosis and vertebral fusion. Disorders of skin pigmentation are also seen in many cases. Beyond physical manifestations, a wide range of developmental and learning delays have also been reported. Most frequently, these are presented in the literature under the broad category of psychomotor delay. More specific descriptions include delayed social, emotional, and language development. In addition, there are reports of learning disabilities despite average intelligence levels. While some form of developmental delay is regularly reported in cases of trisomy 20, there is little inclusion of psychiatric and behavioral features reported in the literature. Research addressing the complex interplay between genetics and behavior continues to evolve and expand in unique ways. For instance, there is growing evidence that certain genes and genetic conditions may predispose individuals to aggressive or impulsive behaviors and therefore increase their risk of criminal activity. In this work, we report the case of a young adult male with trisomy 20 who committed homicide. His developmental history, eventual diagnosis of trisomy 20, and the role of this genetic condition in his homicidal act and at his capital sentencing trial hearing are described. No prior research addressing the relationship between trisomy 20 and homicide was discovered during our search of major scientific and legal databases.

NEOCORTICAL INTERNEURON SUBTYPE DYNAMICS IN THE PRIMARY VISUAL CORTEX OF MICE: A POTENTIAL CORTICAL CIRCUIT MOTIF FOR SENSORY DETECTION

Alexander I. More, BS, Christopher A. Deister, Alec R. Tulett, Christopher I. Moore

Inhibitory interneurons are critical to cortical network function, and diversity among them is thought to control the trial-by-trial dynamics that shape perception (Moore et al., 2010). Parvalbumin-positive fast-spiking interneurons (PV/FS) strongly and quickly hyperpolarize their targets, and stimulation of individual PV/FS can in some cases enhance tactile detection (Doron et al., 2014; Siegle et al., 2014). Somatostatin-positive interneurons (SOM) are another class of neocortical GABAergic cells that target PV/FS and pyramidal dendrites, and are poised to modulate sensory integration and long-term cortical plasticity (Scheyltjens et al., 2018).

Recent studies in a variety of sensory modalities have tied PV/FS and SOM activity, and their dynamics on single trials, to perceptual success (Sachidhanandam et al., 2016; Takahashi et al., 2016). Typically, these studies (including those of our lab) have considered PV/FS and SOM as functionally homogenous populations. In contrast, the most recent PV/FS studies from the Moore laboratory in primary somatosensory cortex (SI) found functional heterogeneity in PV/FS dynamics that predicted success in a tactile detection task (Deister et al., in revision). Specifically, two populations of PV/FS exist that show either higher evoked firing rates for hits or for misses. These inhibitory dynamics suggest a specific wiring diagram that, when implemented in a computational model, can explain the rate and correlation dynamics in pyramidal neurons that carry perceptually-relevant signals. Based on preliminary evidence from our lab, there are multiple SOM subtypes as well that predict both hits and misses, with a bias toward hit-predictivity. These findings, in combination with our model circuit motif, implicate hit-predictive SOM as the regulator of miss-predictive PV/FS, and that these cells open a gate for successful sensory perception.

To test the generality of these task-predictive PV/FS and SOM dynamics and related pyramidal behavior, we have imaged PV/FS, SOM, and pyramidal neurons in Layers 2/3 of the primary visual cortex (V1) of mice during contrast detection. The PV-Cre and SOM-Cre driver mouse lines are used to express genetically encoded calcium indicators for two-photon imaging experiments in V1. A visual detection task established in our lab assesses basic detection of stimuli with different contrasts and probes PV/FS and SOM function, rate dynamics, and correlation structure.

ATTITUDES, PERSPECTIVES, AND PREVALENCE OF MOLECULAR GENETIC TESTING IN AUTISM SPECTRUM DISORDERS: BIG LESSONS FROM THE SMALLEST STATE

Daniel Moreno De Luca, MD, Molly Goldman, RI-CART, Stephen Sheinkopf, Eric Morrow

Objective: Autism spectrum disorders (ASDs) are among the psychiatric conditions with the highest genetic burden, with clinically identifiable pathogenic genetic changes explaining up to 40% of cases. This has led to the recommendation of genetic testing, specifically chromosomal microarray and Fragile X testing, as a key element in the evaluation of people with ASD. However, there is a large practice gap between professional recommendations and clinical practice, with only a minority of patients tested. Understanding the reasons behind this dissonance is a crucial need; if it is not met, the implementation of genetic testing at a large scale may not be achieved.

Methods: To address this, we have set off to assess the attitudes and perspectives about genetic testing, and its prevalence, in a large community sample of people with ASD from a single state: the Rhode Island Consortium for Autism Research and Treatment (RI-CART). With over 1800 families currently enrolled within a delimited geographical region and with a racial and ethnic diversity that mirrors that of the US as a whole, RI-CART is a unique resource to answer these questions at a population level. For these assessments, we have developed a descriptive, cross sectional electronic survey that aligns with constructs from the Consolidated Framework for Implementation Science Research (CFIR).

Results: Our preliminary data show that only 4.1% of participants have had both recommended genetic tests. The average age at diagnosis of people who received any genetic testing was 4.4 years vs. 6.72 years for those who did not. The frequency of intellectual disability was higher in participants who were tested compared to those who weren't (OR 3.107, 95% CI 2.072 - 4.657); this was also the case for epilepsy (OR 6.186, 95% CI 2.561 – 15.141). We are administering the detailed survey to follow up on these preliminary results.

Conclusions: Our preliminary data is in agreement with the striking dissonance between professional recommendations and clinical practice around genetic testing for ASD. Once completed, these studies will allow us to gain a deeper understanding of the adoption of these guidelines at a state level, as well as patient factors that may be driving these results, paving the road to developing strategies to increase the adoption of genetic testing for ASD.

RESPONSE INHIBITION IN YOUTH WITH OCD COMPARED TO YOUTH WITH ANXIETY DISORDERS

Sarah Morris, PhD; Han Joo Lee; Martin Franklin

Deficits in response inhibition (RI), a neuropsychological process necessary to suppress inappropriate or irrelevant responses or actions, have been found in studies of adults with obsessive compulsive disorder (OCD). The few studies that have examined RI capabilities in youth with OCD have employed varying methods for measuring RI and relied on small samples. This research has yielded mixed findings, leaving an incomplete picture of RI functioning in pediatric OCD. In the present study, 28 treatment-seeking youth with OCD were compared with 27 treatment-seeking youth with anxiety disorders on three response inhibition tasks (stop signal task (SST), the go/no-go task, and the Stroop task). Compared to anxious controls, the OCD group showed a significantly shorter stop signal delay and a shorter go-trial reaction time on the SST. These data suggest that compared to anxious children without OCD, those with OCD may be characterized by a somewhat faster go action tendency combined with a greater difficulty canceling action in response to delayed stop signals. No significant differences emerged between groups in stop signal reaction time (SSRT) or on other RI tasks. Within the OCD group, overall OCD severity showed a medium effect size correlation with SSRT and showed small-sized or negligible correlations with overall levels of depression or anxiety. Results provide some supporting evidence for an RI deficit in youth with OCD and that the SST may be used to assess patterns of RI deficiency in pediatric populations. Results are not consistent with findings in adults with OCD, which have shown impairments in SSRT. Possible explanations for this inconsistency related to neurodevelopmental processes are discussed.

REWARD-RELATED NEURAL CORRELATES OF ANTISOCIAL BEHAVIOR, CALLOUS-UNEMOTIONAL TRAITS, DISINHIBITION AND SENSATION-SEEKING IN AN URBAN SAMPLE OF LOW-INCOME ADOLESCENTS

Laura Murray, MS; Christopher S. Monk; Nestor Lopez-Duran; Colter Mitchell; Luke W. Hyde

Antisocial behavior (AB) is a heterogeneous construct which includes acts of physical and sexual aggression, rule-breaking, and delinquency. Adolescent AB has tremendous societal costs, as individuals who engage in AB as adolescents are at increased risk for persistent and severe AB in adulthood. Youth high on AB perseverate on previously rewarded strategies that are no longer rewarded, which could lead to chronic offending even in the face of punishments. Dysfunction in frontostriatal reward neurocircuitry is thought to increase the risk that individuals engage in AB. However, extant research conflicts as to whether adolescent AB is linked to hyper- or hyposensitivity within reward-related neural circuits. One explanation for these mixed findings is a failure of previous research to address specific phases of reward processing including anticipation versus consumption of rewards and the use of relatively small and non-representative samples. A second potential explanation for conflicting findings may be a failure to examine sources of heterogeneity within AB such as callous-unemotional (CU) traits, and whether disinhibition or sensation-seeking may confound associations between AB and neural response to reward and loss.

The current study examined whether AB was associated with reward- and loss-related neural function in a large, well-sampled cohort of primarily low-income youth. The study examined whether AB was associated with unique associations with reward and loss processing, or whether they were confounded by disinhibition or sensation-seeking traits. Finally, the study parsed heterogeneity within AB, by examining the potential moderating effect of CU traits on links between AB and reward and loss-related neural functioning. The study examined a subsample of 128 youth (mean=15.9 years old), recruited from the longitudinal Fragile Families and Child Wellbeing Study (FFCWS; Reichman, Teitler, Garfinkel, & McLanahan, 2001). Neural response to reward and loss was examined using a novel-version of the Monetary Incentive Delay (MID) task. Results indicated that AB was negatively correlated with neural reactivity in the medial parietal cortex including the precuneus, paracentral lobule, and postcentral gyrus during Reward Win versus No Win trials. These associations were not better explained by disinhibition or sensation-seeking, nor were they moderated by CU traits. AB was also linked to a large cluster of reduced frontoparietal reactivity during Loss Outcome versus No Loss. Conjunction analyses revealed that although a portion of this network was shared with disinhibited traits, most of the reduced reactivity in this network during loss processing was uniquely associated with AB. Moreover, these links were significantly moderated by CU traits such that the pattern of reduced frontoparietal reactivity was strongest for youth with higher levels of CU traits. In sum, the study identified largely unique effects of AB on reward and loss-related neural functioning that were not better explained by disinhibition or sensation seeking. Thus, the study provides further evidence of the importance of reward and loss-processing in the etiology of AB and may explain why youth with AB continue to engage in risky, reward-driven behaviors despite severe potential consequences.

IMPLEMENTATION AND EVALUATION OF TREATMENT OUTCOMES RESEARCH AMONG CHILDREN ADMITTED TO AN EVIDENCE-BASED PARTIAL HOSPITAL PROGRAM

Katharine Musella, BA, Mona Yaptangco, Ph.D, Teri Preddy, Ph. D., Stephanie H. Parade, Ph. D., Anne S. Walters, Ph. D.

There has been an emergent trend in medical settings towards utilizing patient-reported outcomes. Accordingly, this has led to the development and use of pediatric health-related quality of life and well-being measures, including the PedsQL 4. 0. Providing effective and quality treatment for childhood mental health problems is crucial. Yet, measuring clinical outcomes often remains elusive for many clinical service units to implement, particularly in hospital-based programs where the lengths of stay are short and treatment goals may be modest. However, it is essential to evaluate whether these programs are effective in improving child mental health outcomes. This study seeks to examine the utility of the PedsQL in evaluating treatment outcomes while working to establish norms in a clinical psychiatric setting. Children participating in the Children's Partial Hospital Program (CPHP) typically present with a variety of internalizing and externalizing problems and receive CBT focused therapy. Thus, an additional aim is to provide preliminary evidence for the effectiveness of a multidisciplinary partial program in both treating and improving child psychosocial wellbeing and family functioning. For the current study, outcomes research was implemented into admission and discharge procedures in a CPHP setting for children 7-12. Survey data was collected via a data capture system, REDCap. Parents completed the parent report of the PedsQL 4. 0 and Family Impact Module 2. 0 and children completed the PedsQL child report. A majority of youth in the sample were male 68% with a mean age of 10. Paired samples t-tests of child reports suggested significant improvements across all factors including Emotional Functioning $t(105) = -15. 28$, $p<. 001$, Social Functioning $t(105) = -7. 84$, $p<0. 001$, School Functioning $t(104) = -8. 46$, $p<0. 001$, Psychosocial Functioning $t(102) = -14. 11$, $p<0. 001$, and Total Score $t(95)= -12. 76$, $p<. 001$. Parents reported significant improvements across all factors including Emotional Functioning $t(109)= -17. 26$, $p<0. 001$, Social Functioning $t(111)= -10. 48$, $p<0. 001$, School Functioning $t(108)= -10. 10$, $p<0. 001$, Psychosocial Functioning $t(106)= -15. 34$, $p<0. 001$, and Total Score $t(98)= -14. 24$, $p<0. 001$. Parent reports also indicated improvements in family functioning including Daily Activities $t(106)= -8. 68$, $p<0. 001$ and Family Relationships $t(109)= -12. 52$, $p<0. 001$. Accordingly, results demonstrate preliminary evidence that the PedsQL can be utilized to evaluate treatment outcomes in a short-term partial hospital setting. Further, children and families participating in a CPHP report significant improvements in multiple aspects of psychosocial functioning including emotional, social, school, and family functioning upon discharge. We are currently working to evaluate whether patient characteristics may moderate treatment outcomes to better understand why the gains made by some families are limited in comparison to other families. This study also yields support for continuing to establish norms for this clinical population which allows for a comparison to norms for children presenting to other levels of care (e. g. , outpatient, inpatient).

SOCIAL MEDIA EXPERIENCES OF PSYCHIATRICALLY HOSPITALIZED ADOLESCENTS

Jacqueline Nesi, PhD, Jennifer Wolff, PhD

Adolescents' use of social media (SM) has increased drastically, with critical implications for psychosocial development. Research increasingly supports a differential susceptibility model of media effects, whereby certain adolescents show heightened risk for negative effects of SM use. Emerging research with community samples of youth suggest that mental health concerns, including suicidality and internalizing symptoms, may heighten vulnerability to negative SM experiences. However, almost no research to date has examined SM use among youth with clinically severe psychiatric presentations. We sought to determine the prevalence of positive and negative SM experiences among a large sample of psychiatrically hospitalized adolescents, and to explore differences in SM use based on diagnostic presentation. Participants included 433 adolescents (ages 11-18, Mage=14.6) who were hospitalized in a psychiatric inpatient facility. Demographic information was collected from medical records. Participants were 61.7% female; 66.5% White, 10.2% African American, and 19.6% Hispanic/Latinx. 87.8% of participants reported having access to a cell phone (82.2% to a smartphone). 30.7% of participants used SM an average of one hour or less per day, 41.3% between 2 and 5 hours, and 27.9% more than 5 hours. Surveys were self-administered at the beginning of the patient's hospital stay. A 10-item measure of positive and negative SM experiences was developed based on a review of prior literature. Participants indicated (yes/no) whether they had any of these experiences in the two weeks prior to hospitalization. Participants completed a single item from the Self-Injurious Thoughts and Behaviors Interview (SITBI) assessing lifetime history of a suicide attempt. Trained master's and doctoral level clinicians administered the Children's Interview for Psychiatric Syndromes (ChIPS) to determine psychiatric diagnoses.Chi-square tests compared the prevalence of SM experiences by sex and logistic regression analyses examined associations between SM experiences and psychiatric concerns, with adjusted odds ratios accounting for sex. The prevalence of SM experiences was compared between participants with and without at least one prior suicide attempt in their lifetime. In addition, SM experiences were compared between those with and without internalizing disorder diagnoses (i.e., any anxiety or depressive disorder). The majority of youth reported positive experiences on SM in the past two weeks, including using SM to distract from difficult situations (65.4%) and receiving support or encouragement from friends (57.0%). However, negative emotional experiences were also common, with 37.4% having compared themselves negatively to others on SM and 30.7% feeling left out or excluded. These experiences were particularly common among girls, compared to boys. In addition, youth with internalizing diagnoses were 8.54 times more likely to report having compared themselves negatively to others and 4.78 times more likely to have felt excluded. A small percentage of youth had viewed content encouraging suicide (14.8%) or self-injury (16.6%); these behaviors were particularly common among youth with internalizing disorders and/or lifetime history of at least one suicide attempt.

Findings indicate high prevalence rates of both positive and negative SM experiences, echoing emerging research suggesting heightened emotional responses to SM among vulnerable youth. In addition, certain negative experiences (comparing self negatively to others and feeling excluded) and behaviors (viewing pro-suicide content) may be particularly common among youth with internalizing disorders and a history of suicide attempt. Results provide a critical starting point for understanding SM experiences that may serve as intervention targets among youth with mental illness.

PROSPECTIVE ASSOCIATIONS BETWEEN MATERNAL SMOKING DURING PREGNANCY AND PARENTING BEHAVIORS AT SIX MONTHS POSTPARTUM

Cynthia Nguyen, BA, Samantha Goldman, B.S., Dalaney Vonderahe, B.S., Meaghan McCallum, Ph.D., Kristyn Wong, Ph.D., Stephanie Parade, Ph.D., Laura R. Stroud, Ph.D.

Background: Maternal smoking during pregnancy (MSDP) remains a major public health concern. In the US, over 7% of pregnant women smoke with rates of >15% in poor, less-educated, and underserved populations. Considerable variability in cigarette use occurs over the course of pregnancy, with a subset of women spontaneously quitting and remaining abstinent through delivery. MSDP is associated with increased irritability and difficulty self-soothing in infancy, and disruptive behaviors and attention deficits in childhood. Given higher levels of maternal-fetal attachment observed among quitters relative to persistent smokers and nonsmokers (Massey et al., 2015), and associations between MSDP and comorbid maternal conduct disorder, ADHD, and antisocial behavior, it is plausible that MSDP may be associated with altered parenting. Indeed, among parents of young children, mothers who quit smoking during pregnancy have demonstrated increased responsiveness to young children relative to persistent smokers. In the present study, we sought to understand the influence of MSDP on parenting behaviors during infancy. In particular, we investigated differences in maternal responsiveness to infants during play between pregnancy quitters, persistent smokers, and nonsmokers.

Methods: Participants included 143 mother-infant dyads (N=24 pregnancy quitters; N=39 persistent smokers; 80 non-smokers). The sample was racially/ethnically diverse (34% Hispanic, 18% Black, and 16% other/>1 race; 32% White), and low income (63% had household annual income ≤$30,000); average maternal age was 26 ± 5. Pregnant women completed 2-4 interview sessions across pregnancy and delivery (34-41 weeks), including a Timeline Followback (cue/calendar-based) assessment of daily cigarette use over pregnancy and biochemical confirmation of smoking status by saliva cotinine levels. At 6-months postpartum, mothers and their infants engaged in a 7-minute Free Play Task designed to assess maternal responsiveness and parenting. Maternal behavior during the Free Play Task was coded according to the Parent Caregiver Involvement Scale and Emotional Availability Scales; coders were blind to MSDP status.

Results: Controlling for maternal age, race/ethnicity, and socio-economic status, we found a significant impact of persistent MSDP across several indices of parenting behavior, while mothers who quit smoking showed parenting behaviors more similar to non-smokers. Specifically, persistent pregnancy smokers showed lower levels of maternal sensitivity ($F(141)= 5.47$, $p= .021$), lower levels of acceptance toward their infants ($F(141)= 4.46$, $p= .037$), and lower levels of positive regard toward their infants ($F(130)= 5.66$, $p= .02$) relative to pregnancy quitters and non-smokers. Shared positive emotions, enjoyment, scaffolding, intrusiveness, structuring/intrusiveness, hostility, and availability levels during free play did not significantly differ by MSDP status.

Conclusion: Women who continued to smoke during pregnancy demonstrated decreased sensitivity, acceptance, and positive regard during interactions with their infants relative to mothers who were able to quit smoking during pregnancy and mothers who did not smoke. Findings highlight the possibility that differences in parenting characteristics between persistent smokers and quitters/nonsmokers may contribute to or moderate the known adverse impact of MSDP on infant behavior. Results have implications for education and prevention efforts with pregnant and postpartum smokers, along with elucidating pathways underlying the intergenerational transmission of smoking.

FRONTAL BEHAVIOR SYNDROMES IN IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS AS A FUNCTION OF ALZHEIMER'S DISEASE BIOMARKER STATUS

Madison Niermeyer, MS, Chad Gaudet, MS, Paul Malloy, PhD & Athene Lee, PhD

Objective: Cognitive impairment and apathy are relatively well documented features of idiopathic normal pressure hydrocephalus (iNPH; Allali et al., 2018; Ogino et al., 2006; Picascia et al., 2006). However, little research has examined other neuropsychiatric manifestations of iNPH. In addition, it is unknown whether the neuropsychiatric presentation differs for iNPH patients with comorbid Alzheimer's disease (AD), which is one of the most common comorbidities in iNPH (Cabral et al., 2011). The present study aimed to characterize the rates of three frontal behavioral syndromes in iNPH using the Frontal Systems Behavior Scale (FrSBe; Malloy & Grace, 2001). The study also evaluated whether neuropsychiatric behavioral changes are exacerbated by the presence of Alzheimer's disease (AD) biomarkers.

Participants and Methods: Fifty participants from the Butler Hospital's Normal Pressure Hydrocephalus clinic met criteria for the study (52% female). Participants, on average, were 75.72 years old (SD=7.45) and had 13.36 years of education (SD=2.44). Diagnosis of iNPH was determined by clinical symptomatology and the presence of ventriculomegaly on neuroimaging. AD biomarker status was determined by either amyloid PET imaging (amyloid PET standard uptake value ratio > 1.1) or cerebrospinal fluid (CSF) assays (CSF total tau to Aβ42 ratio > 1). To appraise neuropsychiatric symptomatology, patients' caregivers completed the FrSBe informant scale.

Results: Chi-square tests comparing pre- and post-onset of illness ratings by informants revealed that the number of participants who converted to clinically significant T-scores (T ≥ 70) was statistically significant for the apathy [X2 (1, N=50)=5.81, p=.016] and dysexecutive scales [X2 (1, N=50)=4.47, p=.036] of the FrSBe, but not the disinhibition scale [X2 (1, N=50)=3.23, p=.072]. Higher scores on the dysexecutive subscale [t(11.93)= -2.376, p=.035], but not the apathy scale, were seen for individuals with AD positive biomarkers relative to individuals with AD negative biomarkers.

Conclusions: The present results replicate prior research demonstrating that apathy is a prominent neuropsychiatric feature of iNPH. The current study also extends the existing literature by showing that dysexecutive behavioral symptoms are also present among individuals with iNPH in addition to apathy, allowing for a more thorough understanding of the types of frontal systems behavior change that are present in the disorder. Dysexecutive behaviors are most prominent/severe in patients with iNPH and comorbid AD. Given these findings, further research that examines the effect of intervention (shunt response) on dysexecutive behaviors in iNPH and whether this response differs as a function of AD biomarker status is warranted.

DEVELOPMENT OF AN AGITATION SCALE FOR THE PEDIATRIC EMERGENCY DEPARTMENT

Nicholas Nissen, BA, Amy Rouse M.D., Claire Williams M.D., Susan Duffy M.D., Kathleen Donise M.D.

Objective: To assess the knowledge, roles, and methods for managing pediatric ED agitation for later development of novel pediatric agitation scale.

Background: Our institution has increasing ED visits for psychiatric emergencies. Psychiatric patients have longer ED stays and may present safety concerns. There is currently no validated pediatric agitation scale for determining when use of verbal interventions, or mechanical or chemical restraints are indicated.

Methods: Qualitative interviews of various stakeholders (2 E.D. attending physicians, 2 E.D. physician fellows, 1 E.D. resident physician, 1 pediatric resident physician, 2 registered nurses, 2 certified nurse assistants, and 2 security guards) focusing on criteria for recognizing agitation, stakeholder roles, and selecting verbal, mechanical or chemical restraints.

Results: Criteria including motor activity, verbalization of thought, emotional state, attention, communication deficits, and threatening behavior in pediatric patients are being compiled. ED employee roles in patient stabilization, relative rates of verbal, physical, and chemical restraint use and their criteria for use is being collected.

Conclusions: Assessing staff knowledge, roles in agitation stabilization, and selection of verbal, mechanical, or chemical restraints will allow our development of a pediatric agitation scale for dissemination and later validation for more consistent, ethical agitation management in the pediatric emergency department.

REVIEWING THE MENTAL HEALTH OF MEDICAL STUDENTS AND YOUNG DOCTORS

Nicholas Nissen, BA, Edward Feller, M.D.

Background: Suicide is a known hazard for health professionals, disproportionately affecting physicians more than the general population. Additionally, burnout, marked by emotional exhaustion, loss of work enthusiasm, depersonalization, cynicism, and a reduced sense of accomplishment, has been found to affect up to 50% of physicians. While several studies individually focused on suicidality, depression, or burnout in medical trainees, there is need for a systematic review to further understand all findings in relation to one another.

Objective: Identify demographics, risk factors, protective factors, and the combined effect of burnout and depression on suicidality in medical trainees.

Methods: Relevant publications were identified via electronic searches of MEDLINE and PsycNet from inception to the present, and reference lists of relevant articles were investigated. The keywords suicide, physician, medical student, trainees, burnout, and depression were utilized.

Results: Suicide is the most common cause of death for male residents, and the second-most common cause of death for female residents after malignancy. 74% of suicides occurred within the first two years of residency training. Notably, males had a suicide rate more than 2.5 times higher than that of female residents.
Physicians have an apparent abundance of protective factors against suicide, including the tendency to be married (88%), employed, relatively well-paid, and highly educated. However, many doctors and trainees lack regular healthcare utilization. As low as 24% of physicians and trainees had seen a provider in the last year, suggesting this population is less regularly screened and treated for depressive symptoms and suicidal ideation. Their medical knowledge increases risk for suicide completion.
The prevalence of moderate to severe depression in medical students is 14.3%, with women experiencing more moderate to severe depression. Additionally, clinical medical students report more suicidal ideation than preclinical students (7.9% vs. 1.4%). Depression is higher in medical students than medical residents, with females more affected.
As many as 50% of medical students experience burnout at some point in training, with 11% reporting suicidal ideation during medical school. This SI rate is significantly higher than for age-matched individuals in the United States (11% vs. 6.9% for 25-34 year-olds). Students were 3.46-fold more likely to report SI if they had burnout.

Conclusion: Suicide disproportionately affects physicians and trainees. Physicians and trainees appear to have very few risk factors and an abundance of protective factors. Nonetheless, burnout is common and appears to be strongly correlated with SI, so it may contribute to increased suicidality in this population. Accurate data on medical student suicide rates, identified risk factors, and the efficacy of intervention strategies are needed to implement effective suicide prevention programs for trainees.

FACTORS ASSOCIATED WITH EMOTION REGULATION DEFICITS IN AN ANXIOUS SAMPLE OF YOUTH

Erin O'Connor, PhD, Abbe Garcia, PhD

Current theories of anxiety disorders implicate emotion regulation as an important process in the development and maintenance of anxious symptomatology. Anxious youth have been found to experience more intense and frequent negative arousal compared to non-anxious youth (Carthy et al., 2010; Suveg & Zeman, 2004) and are more likely to experience poor emotion coping and higher levels of emotion dysregulation and negative affect (Suveg et al., 2009; Zeman et al., 2010). Despite ample research suggesting anxious youth exhibit deficits across a number of emotion regulation domains compared to non-anxious youth, little is known about the variability in emotion regulation and what accounts for such variability.

The current study examined clinical domains contributing to variability in parent- and child-reported emotion regulation deficits among 174 anxious youth (ages 8-12). Clinical characteristics previously shown to be related to emotion regulation deficits were examined, including externalizing symptoms, attention difficulties, anxiety severity and comorbid OCD. Emotion regulation measures consisted of the Emotion Regulation Checklist (parent-report) and Children's Emotion Management Scale (child-report). Child clinical characteristics were measured using the Anxiety Disorders Interview Schedule for Children, Child Behavior Checklist, and Multidimensional Anxiety Scale for Children.

In order to examine the relative contribution of child clinical characteristics to the various indices of emotion regulation, a series of multiple regressions were conducted in which each measure of emotion regulation (parent- and child-report of emotion dysregulation, parent- and child-report of emotion coping) served as the dependent variable. Multiple regression analyses indicated that youth externalizing symptoms were uniquely related to both parent- and child-report of emotion dysregulation, with youth with higher levels of externalizing symptoms showing greater emotion dysregulation. Externalizing symptoms were also found to negatively relate to emotion regulation or coping, but to a lesser degree than in emotion dysregulation. Youth who perceived themselves to be more anxious also reported more emotion dysregulation, although this was not found for parent-report of emotion dysregulation.

These findings suggest that previously observed emotion regulation difficulties among anxious youth may be related to comorbid externalizing symptomatology and that anxious youth with this particular symptom constellation may be particularly vulnerable to emotion regulation deficits. Given that anxious youth with comorbid externalizing disorders may do less well following cognitive behavioral therapy for anxiety (Hudson et al., 2015), understanding the way in which emotion regulation deficits relate to anxiety and externalizing comorbidity may inform treatment optimization efforts.

EFFECTS OF A BOUT OF EXERCISE ON MOOD IN PEOPLE WITH DEPRESSION AND WITH AND WITHOUT PHYSICAL PAIN

Bailey O'Keeffe, BS, Aubrey Legasse, Celeste Caviness, Ana Abrantes, Lisa Uebelacker

Background: Physical activity has many important health benefits, including reduction in symptoms of depression and anxiety and decrease in pain levels. However, both physical pain and mental health symptoms can be barriers to participating in physical activity. Despite this, exercise is recommended for everyone, including those who report physical pain. The purpose of the current study was to assess the immediate impact of a bout of exercise on mood in depressed participants with and without current (past month) physical pain. We hypothesized that a single bout of exercise would decrease sadness, anxiety, and irritability, and increase energy, in depressed participants with and without pain.

Methods: In the current study we analyzed 107 individuals with elevated depressive symptoms recruited as part of a clinical trial examining interventions to help depressed people increase physical activity. Individuals were asked to rate their mood (Sadness/depression, anxiety/nervousness, irritability, and energy) on a 0-10 scale, complete 1-mile walk test on a treadmill, and then rate their mood again.

Results: Participants averaged 46.3 years of age (SD=12.02), and 86.0% were female. Thirty-four percent reported having at least "moderate" current (past month) physical pain. In the sample as a whole, all pairwise comparisons between pre- and post-exercise ratings of mood were statistically significant (p <.001) and in the expected direction. We examined whether the presence of pain moderated the degree of mood improvement. We found that people with at least moderate pain showed greater decreases in sad mood from pre- to post- exercise bout.

Discussion: As hypothesized, a single bout of exercise was associated with decreased sadness, anxiety, and irritability, and increased energy in a population of adults with depression. Notably, the changes in sadness were greatest in those who reported physical pain. Further research might examine whether these short-term effects on mood mediate the longer-term effects of sustained exercise on depression and physical functioning in people with and without pain.

NOVEL SLC9A6 MUTATIONS IN PATIENTS WITH AUTISM

Qing Ouyang, PhD, Brian Kavanaugh, Giulia Righi, Anthony Crown, Michael Schmidt, Lisa Pavinato, Alfredo Brusco and Eric M. Morrow

Abstract: Autism spectrum disorder (ASD) represents a heterogeneous group of neurodevelopmental disorders that affect communication and behavior. Many rare genetic variants have been found in syndromic forms of autism; however, the relationship between the genes and other more complex, non-syndromic forms of autism remains unclear. SLC9A6 encodes the endosomal Na+/H+ exchanger NHE6. Loss-of-function mutations in SLC9A6 cause Christianson syndrome (CS), a severe X-linked neurodevelopmental disorder characterized by: intellectual disability with non-verbal status, post-natal microcephaly, seizures, truncal ataxia, hyperkinetic behavior, autistic features, secondary motor regression, and cerebellar atrophy. Here, we found 3 new mutations in SLC9A6 - a missense mutation, an in-frame 2 amino acid deletion, and a 5 bp intronic deletion. The phenotypes of the patients are not compatible with the classical clinical presentations of CS, instead, they all have been diagnosed with ASD. Thus, determining whether these mutations have a deleterious effect on NHE6 function and brain development will help us to better understand ASD. Using cell lines, induced pluripotent stem cells (iPSCs), and CRISPR/Cas9 gene-edited mouse models, we characterized the 5 bp intronic deletion mutation in detail. This intronic microdeletion leads to the skipping of exon 3 and to an in-frame deletion of 26 amino acids in NHE6. Our studies in cell lines showed that skipping of exon 3 (De3) results in an unstable mutant protein that is mostly retained in the endoplasmic reticulum. Co-immunoprecipitation experiments showed that De3 mutant protein forms dimers with wild-type NHE6, indicating that it may function as a dominant-negative if expressed in cells. Using iPSCs derived from the patient, we found that NHE6 expression levels were largely reduced in both iPSCs and iPSC-derived neurons. Results from RT-PCR showed that the alternative splicing event occurs in iPSCs and induced neurons. In the CRISPR/Cas9 gene-edited mutant mouse brain, Slc9a6 levels were also reduced. The combination of these models, human stem cells and an in vivo mouse model, will permit us to bridge between cellular mechanism to circuit function and behavior.

USABILITY OF ELECTRONIC MEDICATION ADHERENCE MONITORING (MEMS®) DEVICES IN PATIENTS WITH PSYCHOTIC-SPECTRUM DISORDERS IMMEDIATELY FOLLOWING A PSYCHIATRIC HOSPITALIZATION

Hyun Seon Park, BS, Brandon A. Gaudiano, Ethan Moitra

Background: Antipsychotic medication non-adherence remains a prevalent issue in the treatment of psychotic-spectrum disorders, with rates of non-adherence ranging from 24% to 90%. Research indicates that medication non-adherence predicts poorer clinical outcomes, such as relapse and rehospitalization, highlighting the potential utility of a reliable measure of medication adherence that can be readily applied to both clinical research and treatment. While various measures of medication adherence exist, including self-report, clinician ratings, and pill counts, the Medication Event Monitoring System (MEMS®), an electronic pill cap that records the time/date of bottle openings, is regarded as the current "gold" standard of objective adherence measures due to its widespread use. However, the applicability of MEMS in clinical and research settings is unclear due to scant data examining characteristics of those who are willing to use MEMS and how feasible and acceptable it is to patients. Moreover, the field lacks qualitative data related to individuals' experiences with and perceptions of MEMS.

Methods: As part of a "parent" study using ecological momentary assessment methods, baseline data were collected from 54 patients with psychotic-spectrum disorders during an index inpatient psychiatric hospitalization and 1-month after discharge. Baseline demographic and clinical characteristics were compared among those willing to use MEMS versus those who refused or were unable to use it (e.g., due to the way their medications were dispensed). Within the MEMS-accepting group, correlational analyses were used to assess agreement between objective and other self-report adherence measures. Lastly, additional qualitative feedback was gathered from those individuals who used MEMS.

Results: Only 25.9% (n = 14) of participants were willing/able to use MEMS in the study. Univariate ANOVAs and χ2 analyses showed that the MEMS-accepting group, compared to the MEMS-refusing group, did not significantly differ on the demographic or clinical variables tested (p < .05). Within the MEMS-accepting group, correlational results revealed unclear agreement between objective and self-report adherence measures (r = .434, p = .139). Review of patient interview data revealed that multiple individuals reported that MEMS functioned as a positive adherence reminder; although some also commented that it felt "intrusive."

Conclusions: Results suggest that willingness to use MEMS is not significantly related to clinical or demographic characteristics in the psychotic-spectrum population of patients post-discharge from inpatient hospitalization. When individuals were willing to use MEMS, their experience was generally positive. However, this was a small percentage of the total sample, and overall patients were not willing or able to use MEMS. This suggests that studies based on MEMS may only be relevant to a relatively smaller subgroup of the patients and may not generalize to the larger clinical population. Lastly, the suboptimal agreement between objective and subjective adherence measures suggests that the data collected using different adherent methods may yield conflicting results. Further research is needed to examine more complex processes involving other variables related to non-suicidal self-injury, such as anxiety or suicide.

COGNITIVE INFLEXIBILITY AND IRRITABILITY IN CLINICALLY REFERRED PRESCHOOLERS

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Background: Cognitive flexibility is the ability to readily reconfigure behavioral responses based on varying stimuli within the environment. This skill allows individuals to multi-task, all the while generating contextually-appropriate behavioral responses. Greater cognitive flexibility has been associated with stronger adaptability to challenging life events and other stressors in adulthood (Dajani & Uddin, 2015). In children, cognitive flexibility is associated with more competent emotion regulation, with research suggesting links to delay of gratification (e.g., Cole et al., 2011) and decreased negative affect (Davis et al., 2010). One recent study identified links between cognitive inflexibility and increased irritability in preschool-aged children (Li et al., 2017), with implications for our understanding of the development of early difficulties in emotion and behavior regulation. However, we are aware of no study to date that has focused on the links between cognitive inflexibility and irritability in young children presenting with clinically significant behavior problems. Such research is of considerable importance, given the potential to provide insight into the development of early psychopathology, including better understanding of the unique and interactive contributions of cognitive and emotional dysregulation in the development of early mental health problems. As such, the goals of this study are: (1) to examine cognitive inflexibility in a sample of clinically referred preschool-aged children, (2) to explore how cognitive inflexibility may cut across extant diagnostic categories, and (3) to examine associations between cognitive inflexibility, irritability, and psychiatric symptom severity in this unique clinical sample.

Method: Participants were 40 preschoolers, ages 3-6, recruited from a psychiatric partial hospital treatment program for young children with severe behavior problems. Participants completed the Early Childhood Battery of the NIH Toolbox, Cognition Domain, consisting of Picture Vocabulary (PV), Flanker Inhibitory Control (FIC), Dimensional Change Card Sorting (DCCS), and Picture Sequence Memory (PSM) tasks (Gershon et al, 2013). Parents completed the Diagnostic Infant and Preschool Assessment (Scheeringa & Haslett, 2010) to assess for oppositional defiant disorder (ODD), conduct disorder (CD), attention-deficit/hyperactivity disorder (ADHD), major depressive disorder (MDD), and post-traumatic stress disorder (PTSD). Parents also completed the irritability scale Multidimensional Assessment Profile for Disruptive Behavior (MAP-DB; Wakschlag et al., 2012).

Data Analysis Plan: Descriptive analyses will be used to characterize this early childhood sample with respect to diagnostic presentation, parent-reported irritability, and performance on tasks of cognitive flexibility. An examination of the associations between these variables will focus on the unique and interactive contributions of cognitive inflexibility and irritability in the prediction of clinical symptom severity.

Discussion: Cognitive flexibility and irritability are important transdiagnostic factors that can may contribute to behavioral dysfunction in multiple ways. An understanding of these processes in young children with behavior problems can provide insight into the nature and development of early psychopathology. Implications for underlying mechanisms of comorbidity, as well intervention, will also be explored.

EFFECTS OF SMOKING ON ENDOGENOUS HORMONES IN INDIVIDUALS WITH ALCOHOL USE DISORDER

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INTRO: Among individuals with alcohol use disorder (AUD), smoking is prevalent. Smoking has multiple effects on hormone secretion, some of which are associated with important clinical implications. Cotinine represents the most reliable biomarker of smoking behavior. Some significant correlations exist between this biomarker and endogenous hormones. Beta-endorphins, is an endogenous opioid neuropeptide known to be involved in stress responses and maintain homestasis, released in the peripherical circulation are affected by nicotine stimulation; nicotine can affect beta-endorphins concentration resulting in changes in pain threshold and immune response. Melatonin, a pineal hormone, exerts potential effects on smoking induced oxidative stress. Plus, melatonin can help to counteract the acute effects of smoking cessation on mood. Alpha-Melanocyte-stimulating hormone (alpha-MSH) an endogenous peptide hormone and neuropeptide of the melanocortin family, production is stimulated by nicotine. Substance P neuropeptide, represents a key responder to preserve biological integrity, likely resulting in stress responses. Oxytocin is a hypothalamic peptide hormone and a neuropeptide. It is involved in empathy, sexual reproduction and childbirth. Smoking indirectly modulates oxytocin neuronal activity determining changes in environmental and stress responses. Also, nicotine can affect orexin activity, increasing appetite. Orexin regulates the release of noradrenaline, one of the neurotransmitters involved in stress. Orexin also is implicated in the induction of behavioral response to stressors.
METHOD: We perfomed a pilot study (n=18) with smokers with alcohol dependence to investigate the relationship between cotinine and endogenous hormones.
RESULTS: We found strong positive correlations between cotinine and the following hormones: Beta-endorphin (r16= .604; p=.008), melatonin (r(16)=.509 p =.031), alpha-MSH (r(13)= .645 p = .009), Substance P (r(16)= .470 p = .049), oxytocin (r(16)=.667 p = .002), orexin (r(14)=.742 p = .001).
CONCLUSION: We found that most of these hormones, correlated with cotinine, are involved in stress systems. Thus, smoking may affect stress responses resulting in a possible impairment of homeostasis and dysregulation of the central feedback response.

OPIOID PRESCRIBING TRENDS, PATIENT CHARACTERISTICS, AND ASSOCIATED ADVERSE OUTCOMES AMONG YOUTH IN A DIVERSE, HIGH-RISK STATE

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Background: The use of opioids for the treatment of pain is controversial, particularly as substantial increases in prescribing rates to adults (~200%) have occurred over the past few decades and are associated with high rates of opioid-related deaths. In youth, there are divergent data in relation to prescribing rates over this same time period and limited data examining aspects of opioid-related morbidity and mortality in patients who received an opioid prescription. The present project investigated opioid prescription rates and associated morbidity and mortality in youth treated within a large university hospital system in the state of New Mexico from 2005-2016.

Methods: All outpatient opioid prescriptions (N=71,647) given to youth below age 21 (N=42,020) from 2005-2016 were extracted from the University of New Mexico Hospital System's Electronic Health Record. The hospital is the state's only Level 1 trauma center and is the primary site of pediatric specialty care. Demographic information and markers of morbidity and mortality were also extracted from medical records. Frequencies across time were calculated for opioid prescriptions and markers of opioid-related morbidity and mortality. Relative risk was calculated for markers of morbidity and mortality based on individual sociodemographic characteristics.

Results: The sample was primarily male (55.0%), Hispanic/Latino (49.6%), English speaking (88.9%), and had public insurance (50.1%). Mean age was 13.54 (sd = 6.50). From 2005-2016, overall frequency of opioid prescriptions increased by 86.6% (from 2470 to 4610) with the largest increase (206.2%) observed from 2005 to 2008 (2470 to 7562). Large increases in opioid-related morbidity and mortality were documented. The percentage of individuals within the sample who experienced an overdose increased steadily from .06% in 2005 (n=1 out of 1736) to 1.36% in 2016 (n=46 out of 3387) and incidence of mortality increased from 2 individuals in 2005 to 46 in 2016 (from .12% of the sample to 1.39%). The percentage of individuals who received a medication for the treatment of opioid dependence (e.g. buprenorphine) within 1 year of receipt of an opioid prescription increased from .06% in 2006 (n=1 out of 1736) to .44% in 2016 (n=15 out of 3387), although was highest in 2012 (.54%; n=24 out of 3983). Significantly increased risk of adverse outcomes was observed in patients receiving more than one opioid prescription, as well as patients who were older, of a minority racial background, and publicly insured or uninsured. In particular, relative risk of death was significantly greater in minority patients in comparison to White patients.

Conclusion: In this sample of diverse, health-care seeking children and adolescents, increases in prescription of opioids to youth and increases in opioid-related morbidity and mortality were substantial and differed based on race. Higher risk of adverse outcomes was observed in youth receiving multiple opioid prescriptions. Results from the present study suggest that prescription of opioids to youth in New Mexico is occurring with greater frequency in comparison to national prescribing trends and provides important information on potential additive risks of adverse outcomes when pediatric patients receive single versus multiple opioid prescriptions.

EXPLORING THE EFFECTS OF EMOTIONAL SUPPORT AND COGNITIVE STIMULATION ON EXECUTIVE FUNCTIONS IN CHILDREN ACROSS SOCIOECONOMIC STATUS

Diego Placido, BA; Jazlyn A. Nketia, Denise M. Werchan, and Dr. Dima Amso

Rationale: We examined whether emotional support and cognitive enrichment have differential effects on executive functions development and whether socioeconomic status (SES) shapes executive functions independent of home enrichment.

Methods: Ninety-four 4- to 9-year-old children completed the Hearts & Flowers Executive Functions Task (Davidson et al., 2006). In the first Congruent block, children were told to press the button on the same side as a Heart icon. In the second Incongruent block, children were told to press the button on the opposite side of a Flower icon (inhibitory control). In the third Mixed rule switch block, children responded using both of the previous rules (working memory, task-switching). Each child's emotional and cognitive enrichment was measured using the Home–SF.

Results & Conclusions: Children with high emotional support did better across all blocks than children with low emotional support, $F(1, 92)=8.34$, $p=.005$, and this interacted with task blocks, $F(2, 184)=7.55$, $p=.001$. There were no significant effects of Cognitive enrichment. We next divided our sample into four groups (Low SES_High Enrichment N=18, High SES_High Enrichment N=13, Low SES_Low Enrichment N=16, High SES_Low Enrichment N=22). When emotional support was low, there was no difference in performance by SES (all ps=ns). When emotional support was high, there was no difference in task performance by SES (all ps=ns). Within SES, high enrichment groups outperformed low enrichment group on the mixed block ($p=.03$). Thus, results indicate that emotional support is an important predictor of EF performance, over and above the effects of family socioeconomic status.

OCD AND OCPD: EXAMINING FEATURES OF A COMMON COMORBIDITY

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Obsessive-compulsive disorder (OCD) commonly occurs alongside other psychological disorders (LaSalle et al., 2004: Samuels et al., 2000), including obsessive-compulsive personality disorder (OCPD). Extant research highlights the frequent occurrence of OCPD in OCD samples (23-32%) (Wheaton & Pinto, 2017) and suggests that this comorbidity may have implications for the heterogeneous symptom presentation seen in OCD. These studies have found associations between OCD symptoms such as symmetry, ordering, repeating, and hoarding, and OCPD symptom criteria such as perfectionism and preoccupation with detail (Coles, Pinto, Mancebo, Rasmussen & Eisen, 2008; Eisen et al., 2006; Baer, 1994). Additionally, higher incompleteness ratings, or 'Not Just Right Experiences' (NJREs) have been linked to OCPD traits (Sibrava, Boisseau, Eisen, Mancebo, & Rasmussen, 2016; Pinto et al., 2017), further strengthening the link between these disorders. Further, evidence of poor exposure and response prevention (EX/RP) treatment outcomes in this group (Pinto, Liebowitz, Foa, & Simpson, 2011) suggests continued research is needed to determine whether OCD with comorbid OCPD represents its own possible subgroup of OCD.

The present study examines the relationship between OCD symptom dimensions and obsessive-compulsive personality traits in a large, well characterized OCD sample, with and without comorbid OCPD. The sample included 98 treatment-seeking OCD patients enrolled in the Brown Longitudinal Obsessive Compulsive Study (BLOCS; see Pinto et al., 2006 for a detailed description) at follow-up. In addition to measures of OCD severity, participants completed the Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010) and the Pathological Obsessive-Compulsive Personality Scale (POPS; Pinto, Ansell & Wright, 2011). Overall, 26.5% of the sample met criteria for OCPD via structured interview. Participants with comorbid OCD + OCPD reported significantly higher scores on the contamination and NJRE subdimensions of the DOCS compared to individuals without OCPD. This comorbid group also reported higher scores across all subscales on the POPS (all ps < .05). Binary logistic regression demonstrated that maladaptive perfectionism (p = .003) and reluctance to delegate (p = .023) were significant predictors of comorbid group classification. These findings further support an interconnectedness between OCD and OCPD, and highlight features of this pattern of comorbidity.

CONNECT SOCCER ACADEMY: BUILDING RESILIENCY THROUGH TRAUMA-INFORMED COACHING

Bryan Rego, BS; Nicole Nugent, PhD; Soeyung Kim, PhD

Recently resettled refugee youth face a dual burden of stressors as they arrive to the United States: stress from lived, traumatic experiences and acculturative stress. As families adjust to life in a new country, children are restricted from various methods of coping including playing soccer. Many refugee youth report playing soccer in their home country or refugee camp as one of the few resources for coping available to them. As their lives change, soccer can be a constant (and constitutes a substantial component of their identities. Sports-based intervention is a cost-effective method to promote resiliency that is accessible to culturally diverse and disadvantaged youth. We propose the following approaches to address post-traumatic and acculturative stress: introducing trauma-informed coaching and using soccer, respectively. Our study follows the creation of a soccer team that has fostered community from within the refugee community while providing coaching informed by didactic programming in resiliency skill-building.

ANGELMAN-LIKE SOCIAL COMMUNICATION PHENOTYPE IN CHRISTIANSON SYNDROME: REPORT OF THREE AFFECTED BROTHERS WITH RELATIVELY HIGHER ADAPTIVE FUNCTION

Giulia Righi, PhD, Rebecca Bradley, The Rhode Island Consortium for Autism Research & Treatment, Eric Morrow

Background: Angelman syndrome (AS) is a neurodevelopmental disorder characterized by intellectual disability, epileptic seizures, ataxia, and significant communication problems. Patients with AS present with differences in sociability, including easily provoked or unprovoked laughter, a generally happy demeanor and frequent smiling from a very young age (Clayton-Smith & Laan, 2003). Christianson syndrome (CS) is an Angelman-like syndrome caused by mutations in the X-linked endosomal Na+/H+ exchanger 6 (NHE6) encoded by the SLC9A6 gene (ref), and phenotypically characterized by severe intellectual disability, non-verbal status, epileptic seizures, ataxia, opthalmoplegia, postnatal microcephaly, and cerebellar and brain stem atrophy. Similarly to AS, most patients with CS display a degree of sociability that exceeds what would be expected based on their level of intellectual disability and other symptoms. The potential presence of relatively preserved sociability in the context of CS can offer a model for better understanding the neurobiology of social behavior.

Objectives: To describe a specific presentation of CS by assessing three brothers whose NHE6 mutations and phenotypic presentation is consistent with CS, and compare their phenotype to that of a sample of autistic individuals with comparable functioning but no known genetic abnormality.

Methods: A family with three affected brothers (ages 14, 21, 24) was recruited as part of a larger study of CS. Participants were assessed with a standardized medical history and behavioral battery. Autism symptoms were assessed using the Autism Diagnostic Observation Schedule – 2nd Edition (ADOS-2). To compare the social phenotypes of CS and ASD, this study analyzed a subset of participants enrolled in RI-CART, a state-wide community-based sample of individuals with ASD and their families. Participants completed demographic surveys as well as behavioral and cognitive measures. In addition to a confirmed diagnosis of ASD and no reported genetic findings, selected RI-CART participants were matched to CS participants for gender (male), language ability and ADOS-2 module, in order to ensure a control sample that was comparable in linguistic functioning.

Results: CS participants scored in the low range on the Kaufman Brief Intelligence Test (K-BIT) with an IQ Composite Standard Score of 40, which is the lowest possible score. For all males, their adaptive behavior composite score, assessed by the Vineland Scales of Adaptive Behavior, 2nd Edition (VABS-II), fell in the very low range, which combined with their IQ score indicates the presence of severe to profound intellectual disability. CS and ASD participants did not differ significantly in age or adaptive functioning, but the CS participants had significantly lower Social Affect Scores on the ADOS-2, which indicates less severe autism symptoms in the domain of social communication. Analyses indicated significantly lower scores specifically on the giving, quality of social overtures, maintenance of attention, quality of social response, and overall quality of rapport items.

Conclusions: These results support the notion that males with CS may have somewhat preserved social communication abilities, as compared to their level of intellectual disability. Previous reports (Pescosolido et al. 2014) noted that CS participants are frequently diagnosed with ASD. While the three brothers in this case series met criteria for ASD on the ADOS-2, they presented with higher sociability as evidenced by their scores on a majority of items in the social communication domain, which were significantly lower compared to participants with ASD who were matched in their level of functioning. These results have clinical implications, as the identification of social strengths in patients with CS can better individualize treatment.

MATERNAL ADVERSE CHILDHOOD EXPERIENCES, PREGNANCY CONDITIONS, AND INFANT BEHAVIOR AT 12 MONTHS POSTPARTUM

Jadira Rodriguez, Laura Frank, Ronald Seifer, Stephanie Parade

Adverse childhood experiences (ACES) are associated with physical and mental health problems across the lifespan. Yet few studies have examined the effects of ACES on maternal health in pregnancy. Likewise, there is very little research focused on the intergenerational effects of maternal ACES on offspring behavioral health outcomes. Recent research suggests that maternal ACES are associated with infant developmental progress (Mcdonnell et al., 2016). We extend this prior research to focus on infant internalizing and externalizing behavior problems, and focus on maternal health and psychosocial conditions in pregnancy as potential mediating mechanisms.

Two hundred and ninety-five mother-infant dyads recruited from Women, Infants, and Children (WIC) clinics participated in this study. Mothers ranged in age from 18-44 years (Mean = 26 years) and were racially and ethnically diverse (40% Hispanic; 42% white, 19% black, 7% biracial, 32% other races). Sixty-one percent of mothers had less than or equal to a high school degree, 66% of the mothers were unemployed in pregnancy, and 44% were first time mothers. Fifty-four percent of infants were female.

Mothers completed interviews and questionnaires to assess their adverse childhood experiences (ACES), depressive symptoms, domestic violence, and stress and health in pregnancy at the time of a prenatal enrollment assessment. At 12 months postpartum, mothers completed the Brief Infant Toddler Social Emotional Assessment (Briggs-Gowan et al., 2004) to assess infant internalizing and externalizing behavior problems.

Multiple regression and bootstrapping procedures (Hayes, 2017) were used to examine direct and indirect effects of maternal ACES on infant behavior problems. Results demonstrated that a) maternal ACES were positively associated with infant externalizing behavior problems ($p < .01$); b) maternal ACES were positively associated with maternal stress in pregnancy, maternal depressive symptoms in pregnancy, maternal physical health problems in pregnancy, and domestic violence in pregnancy (all p's $< .01$); c) maternal depressive symptoms and physical health problems in pregnancy were positively associated with infant internalizing and externalizing behavior problems (p's $< .01$); d) maternal depressive symptoms in pregnancy were positively associated with infant internalizing behavior problems ($p < .001$); e) maternal ACES exerted a significant indirect effect on infant internalizing problems through prenatal depressive symptoms (B =.03, SE = .02, CI = .0062 - .0837); and f) maternal ACES exerted a significant indirect effect on infant externalizing behaviors through maternal physical health problems in pregnancy (B = .06, SE = .04, CI: .0044 - .1515).

Taken together, these results support the view that maternal ACES are relevant to maternal-child health, and that maternal experiences in pregnancy play an important role in the intergenerational effects of ACES. Supporting mothers with a trauma history during pregnancy, through promotion of maternal physical and mental health, may be advantageous for both mothers and infants. Applied implications and directions for future research will be discussed.

PREVALENCE OF PSYCHIATRIC DISORDERS AT THE INTERSECTION OF RACE AND SEXUAL ORIENTATION: RESULTS FROM THE NATIONAL EPIDEMIOLOGIC SURVEY OF ALCOHOL AND RELATED CONDITIONS-III

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Objective: Sexual minority individuals display elevated rates of psychiatric and substance use disorders compared with heterosexuals. Racial/ethnic minority individuals report lower prevalence of disorders compared with white individuals. Research on sexual minority mental health often neglects research on racial/ethnic minority mental health and vice versa. Therefore, at the intersection of sexual and racial/ethnic status, the prevalence of disorders remains unclear. Method: In a nationally representative sample (N = 36,309), we compared disorder prevalence between sexual minorities and same-race/ethnicity heterosexuals. We then examined the extent to which differences in disorder prevalence between sexual minorities and heterosexuals can be attributed to differences in discrimination experiences related to sexual minority status. We next compared prevalence of disorders for Black and Hispanic with white sexual minority individuals. We examined whether these patterns of associations were reflective of transdiagnostic factor differences among groups.
Results: Regardless of race/ethnicity, sexual minority individuals experience higher prevalence of disorders than heterosexuals. Controlling for discrimination experiences partially negates these disparities. At the intersection of racial/ethnic and sexual minority status, disorder prevalence is more nuanced: Although Black sexual minority individuals experience lower prevalence of disorders than whites, Hispanic sexual minority individuals experience similar prevalence of disorders to whites. Similar findings are observed using a transdiagnostic factors framework.
Conclusions: These findings reveal important intersectional nuances in the prevalence of psychopathology often overlooked in the race/ethnicity and sexual orientation literatures. These results can inform future scholarship on risk and resilience among marginalized populations, including identifying protective factors associated with possessing certain multiple minority statuses.

"IT'S A HUMAN BEING THING, NOT A GAY THING": THE CONSEQUENCES OF TAILORED MESSAGING FOR HIV PREVENTION AND PRE-EXPOSURE PROPHYLAXIS USE AMONG BLACK MEN WHO HAVE SEX WITH MEN IN THE SOUTH

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Introduction: Young, black men who have sex with men (BMSM) are the subpopulation with the highest HIV infection rates in the U.S. accounting for over 10,000 new infections per year. One possible approach to HIV prevention is the use of pre-exposure prophylaxis (PrEP), or anti-retroviral therapy as prevention. Specifically, Truvada (emtricitabine 200mg/ tenofovir disoproxil fumarate 300mg) for PrEP has been FDA approved since 2012. However, PrEP uptake and continued use remains low among those most at risk, specifically, young BMSM.

Methods: Qualitative interviews were conducted with 29 young (18-35 years old) BMSM from Jackson, Mississippi to generate content for an HIV prevention intervention. As part of these interviews, participants were asked to provide their thoughts on PrEP as an HIV prevention strategy. Participants were shown video clips about PrEP, some of which were specifically tailored to young, black MSM, to prompt discussion and to inform a video-based intervention. Interviews were audio recorded, transcribed, and coded using thematic content analysis. NVivo was used to organize codes for analysis.

Results: Two overarching themes emerged from the analysis: (1) because of holding multiple, marginalized identities, tailored messaging felt further stigmatizing, and (2) more general messaging and practices would help reduce stigma and therefore, be a better way to promote PrEP. Subthemes included: HIV stigma within the black, gay community; sexual orientation disclosure or "outness" and PrEP; oversaturation of PrEP messaging within the community; and the desire for more inclusive messaging and advertisements around PrEP. Participants also identified the importance of privacy in medical settings, more informed and affirming health care providers, and community awareness around PrEP to destigmatize its use.

Discussion: Given the feedback from these participants, the most effective PrEP messaging for BMSM, may, ironically, not be specifically focused on this population. Instead, it may be best to include diverse individuals and inclusive messaging that promotes PrEP for everyone in order to decrease feelings of stigma in an already stigmatized community.

ELECTRONIC CIGARETTE USE IN PREGNANCY: PREVALENCE, CHARACTERISTICS, AND COMORBIDITIES IN A NEW ENGLAND SAMPLE

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Background: Electronic cigarettes (e-cigarettes) are devices designed to mimic the sensations of a conventional cigarette by heating a liquid (often containing nicotine) to generate vapor that is inhaled. E-cigarettes were initially marketed as safer alternatives to conventional cigarettes; rates of use have increased rapidly since their introduction to the US in 2007, particularly among conventional cigarette smokers and youth. Recent studies have highlighted e-cigarette use in pregnant women, with prevalence rates ranging from 1-15%. However, studies to date have focused on data collected prior to 2015 and the majority of studies have included relatively small sample sizes. Further, more information is needed regarding comorbidity or prenatal e-cigarette use with pregnancy medical and psychiatric conditions and other substance use.

Methods: Utilizing data from a telephone screening survey, we assessed prevalence of e-cigarette use in pregnancy and the preconception period (3 months prior to conception) in a large sample of high psychosocial risk pregnant women in Southern New England. We also compared the social/demographic characteristics of e-cigarettes users, conventional cigarette users, and non-users and assessed differences in comorbid gestational medical conditions, mental health conditions, and other substance use.

Results: Of the 1365 pregnant women surveyed (mean age=27), 54 (3.96%) reported e-cigarette use in pregnancy or preconception (74.07% endorsed dual use of e-cigarettes and conventional cigarettes; 25.93% reported using e-cigarettes only). E-cigarette users were more likely to be White (OR=2.48; p=0.004), more likely to have completed education beyond high school (OR=1.95; p=0.042), and to have an annual household income > \$30,000 (OR=2.84; p=0.001), compared to cigarette-only users. Rates of depression in pregnancy (defined as endorsement of low mood, irritability, or anhedonia at least most days for the 2 weeks) were higher for e-cigarette users than conventional cigarette users (OR=2.06; p=0.048) or non-users (OR=4.28; p<0.001). Compared to non-users, e- cigarette and conventional cigarette users were significantly more likely to report at least one pregnancy complication, depression in pregnancy, serious mental illness, alcohol use, as well as use of marijuana and other drugs during the preconception period (ORs>2.07, ps<0.001).

Conclusions: E-cigarette users were more likely to experience depression in pregnancy, and were more likely to identify as White, higher income, and more educated than cigarette-only users. However, e-cigarette and conventional cigarette users shared several comorbid health characteristics including risk for gestational diabetes and pre-eclampsia, and other drug and alcohol use. Given the rise in e-cigarette use and known developmental toxicity of nicotine, research is needed to determine the impact of e-cigarette use in pregnancy on maternal and fetal health as well as long-term offspring development. Additionally, our findings highlight the importance of screening for e-cigarette use by obstetric providers and providing counseling and education for pregnant women.

VALPROIC ACID ALTERS TRANSCRIPTIONAL AND SIGNALING PATHWAYS IN HUMAN STEM CELL DERIVED HUMAN CORTICAL PROJECTION NEURONS

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Autism spectrum disorders (ASD) are complex, neurodevelopmental conditions characterized by severe impairments in reciprocal social interaction, speech, and communication. Valproic acid (VPA) is an anticonvulsant used for the treatment of epilepsy and bipolar disorder. Previous studies suggest that the prenatal exposure of VPA can increase the risk of autism. However, the molecular mechanisms underlying defects in human neuronal development associated with exposure to VPA are largely unknown.

Male human induced pluripotent stem cells (hiPSCs) were derived to forebrain cortical projection neurons, as ASD associated genes have been shown to converge into this neuronal cell type. In order to investigate gene expression changes elicited by exposure to VPA during early embryonic development, RNA sequencing (RNA-seq) was performed on control and VPA treated hiPSC derived neurons. A bioinformatics pipeline including HISAT-Stringtie-DESeq analysis tools was used for RNA-seq data analysis. A second bioinformatics pipeline (STAR-Htseq-DESeq) was used to validate the analysis method and the results from both pipelines were in concordance. Raw reads in Fastq format were mapped to human reference genome (Ensembl GRCH37) and 2068 differentially expressed genes (DEGs) were identified. Twenty one DEGs were experimentally validated using quantitative PCR (QPCR). All DEGs were analyzed using gene-set enrichment and pathway analysis tools: DAVID, Cytoscape, GSEA and Ingenuity Pathway Analysis (IPA).

1523 up- and 545 down-regulated genes were identified. Among the downregulated genes, an enrichment of genes involved in regulation of transcription and gene expression was found. The upregulated DEGs were shown to be involved in substrate specific channel activity and ion transport. We further analyzed DEGs in GSEA and identified networks using Enrichment Map in Cytoscape. Top networks identified are synaptic and brain activity, extracellular matrix, cell junction, ion transport, signaling and secretion. Our results showed that multiple pathways previously associated with autism are disrupted when exposed to VPA treatment in human cortical projection neurons.

CHANGING PATTERNS OF REPORTED MARIJUANA USE AMONG PREGNANT WOMEN: FINDINGS FROM WOMEN SCREENED FOR PRENATAL CLINICAL TRIALS FROM 2015-2019

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Background: Prevalence of marijuana use and use disorders among U.S. adults has doubled in the past decade. Marijuana use has also increased among pregnant women, with 2.37% reporting past month use in 2002 and 3.85% in 2014 on the National Survey of Drug Use and Health. Results of studies on the risks of marijuana use during pregnancy have been mixed and confounded by other variables, such as concurrent use of tobacco and illicit drugs. However, a meta-analysis by Gunn et al. (2016) found evidence for an increased risk of anemia for pregnant women using marijuana and low birth weight and increased need for NICU placement for their offspring. Due to the potential for harm, lack of FDA oversight, and lack of standardized formulation, doses, or delivery systems, the American College of Obstetricians and Gynecologists issued an opinion in 2017 stating that obstetrician–gynecologists should not prescribe or suggest use of marijuana for medicinal purposes during preconception, pregnancy, and lactation. Despite these concerns, perception of the safety of regular marijuana use among pregnant woman increased in the years between 2005 and 2015.

Methods: We examined data collected during phone screening interviews for two studies examining wellness interventions for pregnant women experiencing stress or depression over the course of 4 years, and analyzed trends in reported use of marijuana, alcohol and tobacco. The current data is based on interviews completed between March 2015 and February 2019. 1231 individuals completed some portion of the telephone screen. The current study focuses on reports of use of marijuana, alcohol, and tobacco use in pregnancy over the 4 years of study recruitment. We also completed exploratory analyses to examine the relationship between changes in the rate of reported marijuana use in pregnancy and participant age group.

Results: Average age of respondents was 29.28 (SD 5.55) and average gestation was 16.25 weeks (SD 4.86). 12.90% were taking a medication for mood, sleep, anxiety, or another psychological problem. 19.50% were in current treatment with a mental health professional. Year of screening for study entry (1-4) was significantly correlated with use of marijuana both prior to pregnancy ($r=.076$, $p=.024$) and during pregnancy ($r=.113$, $p=.002$), but not correlated with use of alcohol, either prior to pregnancy ($r=-.017$, $p=.611$) or during pregnancy ($r=-.001$, $p=.987$). Participants were asked only about current smoking. Year of the study (1-4) was not significantly correlated with reports of cigarette smoking at the time of the screen ($r=.041$, $p=.312$). Finally, over the 4 years, participants were more likely to report marijuana during pregnancy if they were age 25 or younger than if they were over 25 ($\lambda 2$ 19.50 $p=.000$). Respondents who were 25 or younger were more likely to report marijuana use in the 6-months prior to pregnancy ($\lambda 2$ 31.24, $p=.000$).

Discussion: While rates of self-reported alcohol and tobacco use remained stable over the 4 years of study recruitment with no increases or decreases in use, self-reported marijuana use, both prior to and during pregnancy, increased significantly. In addition, participants aged 25 and under were more likely to use marijuana both prior to and during pregnancy. Whether the change in reporting of marijuana use is due to an actual increase in use, or increase in participants' willingness to report use is unclear. However, while pregnant women are routinely advised to abstain from alcohol and tobacco during pregnancy, they may not be aware of the potential for harm of marijuana use in pregnancy. Our team is currently collecting data on participants' reasons for use of marijuana in pregnancy. Future research is needed to clarify trajectories and predictors of perinatal marijuana use, and to develop and test interventions for pregnant women seeking to discontinue. There may be a greater need for education and intervention for individuals less than 26 years of age.

INTEGRATED PSYCHIATRIC CARE IN AN ACADEMIC PEDIATRIC PRIMARY CARE CLINIC: A PILOT PROGRAM (DESCRIPTIVE ABSTRACT)

Amy Rouse, MD, George "Bud" Vana, Donald Pierce

Introduction:
Numerous studies have described the magnitude of psychiatric and developmental disorders affecting the nation's children. About a fifth of all children have some disturbance in those domains, and 4-7% have a significant functional impairment. Disturbingly, rates of suicidal ideation and suicide are increasing among pediatric patients. While the need for behavioral health services is large and increasing, there is an insufficient and dwindling number of child and adolescent psychiatrists (CAP). This has led to a growing interest in integrating physical and mental healthcare, including addressing pediatric mental health problems in primary care settings as described by American Academy of Child and Adolescent Psychiatry (AACAP) guidelines. The Hasbro Primary Care Clinic (HPCC) is a high-volume resident clinic in Hasbro Children's Hospital, the academic pediatric hospital of Brown University, where there are similarly high numbers of visits for psychiatric reasons. HPCC is designated as a patient-centered medical home and has daily access to a social worker, yet until this year there was no sustained co-located access to psychiatry.

Methods:
HPCC and senior triple board (TB) residents launched an integrated care pilot program in July 2018 after an informal needs assessment established its need. TB residents (trained in pediatrics, psychiatry and child psychiatry) are uniquely suited to provide this service, as they have worked in HPCC as pediatric residents and have relationships with the staff and an understanding of the clinic's systems. The pilot seeks to achieve the four core components of collaborative care outlined by AACAP: timely access to psychiatric consultation, direct psychiatric service to children and families, care coordination, and education for primary care clinics. The clinic social worker is an essential part of this collaboration. TB residents are present in the clinic four half-days per week. Providers can consult the social worker to triage need or directly message the TB residents when they are not available. Scheduling is done by the TB residents with administrative support. In January 2019, the CAP supervisor was credentialed in HPCC. Patients are seen in a designated behavioral health room within the clinic.

Results and Discussion:
Since the project's inception, 29 psychiatric evaluations have been scheduled, 23 have been completed and 18 of those patients were seen for follow-up. Real-time consults were inconsistently tracked due to variation in the nature of the questions, but are believed to average 2-3 per clinic day. An unforeseen barrier to co-located care was the complex credentialing process for the supervising CAP in the specific clinical space, impacting all components of collaborative care. For the first six months, evaluations could not be done at the clinic, decreasing the physical CAP presence at HPCC. An increase in the number of scheduled and completed evaluations is anticipated now that credentialing is complete. In evaluating other core areas, there were few significant challenges to providing prompt consultation. Direct psychiatric service provision is limited by physical space and a high no-show rate. The goal of care coordination is met by regular meetings with the CAP supervisor and clinic social worker. Informal feedback from residents and attending physicians indicates that CAP presence in HPCC is appreciated and educational. Though it presents some challenges, integrated psychiatric services in a primary care resident clinic is a viable option for improving access to mental health services for children.

DIFFERENTIAL PATTERNS OF SUBJECTIVE COGNITIVE COMPLAINTS AND CONTRIBUTIONS OF DEPRESSION IN aMCI AND COGNITIVELY INTACT CLINIC PATIENTS

Gennarina Santorelli, MS, Geoffrey Tremont, Ph.D.

Objective: Subjective cognitive complaints (SCC) aid in the diagnosis of mild cognitive impairment (MCI). However, SCC are often not representative of cognitive functioning in cognitively intact memory clinic (CI) patients, and may be underreported in individuals with MCI due to impaired insight. Research on the types of SCC endorsed by cognitively intact and impaired individuals is mixed, and many studies do not consider how individual factors contribute to SCC. The goal of this study was to determine differences in SCC endorsed by CI and amnestic MCI (aMCI) patients on a self-report scale. We also examined associations between depressive symptoms, dementia family history, and SCC.

Participants and Methods: Participants underwent a neuropsychological evaluation and were determined to be either CI (n=40) or aMCI (n=46). They also completed the Cognitive Difficulties Scale (CDS) and the Beck Depression Inventory-II (BDI-II).

Results: CI patients reported greater overall cognitive difficulties than aMCI patients (p=.01, d=0.57). Items related to praxis (CDS Factor 2; p=.01, d=0.57) and orientation for persons (CDS Factor 4; p=.01, d=0.59) were rated higher in CI than aMCI patients. A greater percentage of CI versus aMCI patients endorsed two items related to language (e.g., "I don't say quite what I mean"; ps<.05), two related to attention ("I can't keep my mind on one thing"; ps<.05), and one related to retrospective memory ("I forget steps in recipes I know well"; p<.01). Depressive symptoms were associated with CDS ratings in both groups (CI: r=.76, p<001; aMCI: r=.70, p<.001). CDS ratings did not significantly differ between those with or without a family history of dementia.

Conclusions: Results indicate that patterns of SCC differ between CI and aMCI patients; while both groups endorsed memory difficulties, CI patients were more likely to endorse problems across cognitive domains. Findings suggest that clinicians should consider the pattern of SCC reported and contributions of mood in the diagnosis of MCI.

TEMPORAL TRENDS IN ADOLESCENT TREATMENT UTILIZATION FOR DISORDERED EATING FROM 2004 THROUGH 2017: A NATIONALLY REPRESENTATIVE STUDY

Christina Sanzari, BA, Richard T. Liu, PhD

Eating disorders are prevalent in the general adolescent population, and their impact is demonstrated by generally strong associations with other psychiatric disorders, suicidality, and elevated mortality rates (Smink, van Hoeken, & Hoek, 2012; Swanson, 2011). To what degree trends in treatment use for disordered eating have changed over time is unknown. Such information is important for accurately characterizing the magnitude of this public health concern. To address this gap in the empirical literature, the current study examined temporal trends in treatment utilization for eating disorders in a nationally representative sample of adolescents. Data were drawn from the National Survey on Drug Use and Health for 2004 through 2017. Participants included 236,752 adolescents aged 12 to 17. Using joinpoint regression, we examined trends in eating disorder treatment overall as well as broken down by inpatient and outpatient services. Across the 14 years of this study, overall treatment utilization ranged from 111 to 312 per 100,000. A significant increase in overall treatment utilization was observed starting in 2010 (APC = 8.67, 95% CI = 5.22 – 12.23, p <.01). When inpatient and outpatient service utilization were analyzed separately, a similar pattern was observed for outpatient care, with a significant increase starting in 2010 (APC = 10.71, 95% CI = 5.58 – 16.08, p < .01). In contrast, for inpatient care, a significant increase in service use was observed across the entire 14-year period (APC = 5.12, 95% CI = 2.21 – 8.12, p <.01). When taken together with recent estimates from a nationally representative study of a 12-month prevalence rate of 2,800 per 100,000 for eating disorders in adolescents (Kessler et al., 2012), the findings suggest that even though overall treatment utilization for these conditions has risen over the past fourteen years, only a small proportion of adolescents with disordered eating are receiving the treatment they need. These findings highlight the need for increased efforts to develop strategies to address this unmet need.

BET ON THE 'NET: EXPLORING AGREEMENT IN SUBSTANCE-USE REPORTING BETWEEN ONLINE SOCIAL NETWORKING, CLINICAL INTERVIEW, AND SELF-REPORT SURVEY

Sara Schulwolf, BA; Grant Fong; Soyeong Kim, PhD; Leslie Brick, PhD; Jeff Huang, PhD; Nicole Nugent, PhD

Background: Online social networking (OSN) data analysis is a tool that allows researchers the unique opportunity to collect data from participants' social media. By studying participants' online presences, researchers can gather valuable ecological data. Such data can be analyzed to provide information about sensitive topics (e.g., substance-use and sexual-health behaviors) that might otherwise be missed in self-report or interview methods.
The present study aims to investigate inter-method agreement between substance-use data from self-report surveys, clinical interviews, and OSN analysis in a sample of 50 adolescents. This study will utilize novel methodology to extract content related to substance use from OSN samples and examine whether substance-use reporting is correlated with demographic variables (age, gender, race/ethnicity).

Methods: A sample of 50 adolescents was drawn from an ongoing study of social context following trauma exposure. Sample age ranged from 13-17 (M = 16.18) and included 16 males and 34 females. Data collected using a self-report survey, the Adolescent Alcohol and Drug Involvement Scale (AADIS), and a clinical interview, the Kiddie-Schedule of Affective Disorders (KSADS), were later compared for inter-rater reliability with data gathered from OSN.
Social media data (including Facebook messenger/timeline, texts, tweets and direct messages, WhatsApp messages, and Instagram direct messages and metadata) was extracted using Sochiatrist social data extractor and time anonymizer. A total of 169,625 messages (71,736 sent messages and 97,889 received messages) were queried. Two approaches were used to flag messages that contained drug use, one using iterative keyword recognition (e.g. "smoke," "speed," "high") and the other using anchored word co-occurrence. Program-identified messages were then hand-verified to determine the validity of drug-use endorsement.
Participant-level drug-use data were re-coded as binary. Due to low endorsement of other categories of substances, only 3 substances (nicotine, alcohol, and cannabis) were included in the final analyses. Kappa was calculated for data from KSADS and AADIS, KSADS and OSN, and OSN and AADIS. Bivariate correlations were performed between substance-use data and demographic variables (age, sex, race/ethnicity) to assess for correlation.

Results: Inter-rater reliability between KSADS and AADIS for nicotine and for cannabis use showed moderate agreement (Cohen's Kappa = .621 and .635 respectively). In general, there was poor agreement between OSN and KSADS (Kappa = -.074 -.115). However, inter-rater reliability between OSN and AADIS for cannabis and for alcohol indicated moderate agreement (Kappa = .519, .520 respectively). There were no significant correlations found between substance use and any demographic variables.

Discussion: The novel methodology used to analyze OSN data for endorsements of substance use has profound implications for creating new screening and intervention mechanisms. The lack of agreement between KSADS and OSN, with substance-use endorsement in OSN being higher than in KSADS, indicates that OSN analysis may prove a useful tool for collecting accurate data on substance use in adolescents. This, coupled with the moderate agreement between OSN and AADIS, suggests that adolescents may feel uncomfortable verbally disclosing substance use habits to research personnel. Further, the lack of agreement in reports of nicotine usage between OSN and both self-report and survey indicates varying levels of stigma among substances. More research into the capabilities of OSN analysis is needed, as well as work to create strategies for fostering participant trust and honest disclosures in clinical interviewing.

RELATIONSHIP OF CONSISTENCY IN TIMING OF EXERCISE PERFORMANCE AND EXERCISE LEVELS AMONG SUCCESSFUL WEIGHT LOSS MAINTAINERS

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Regular engagement in moderate-to-vigorous physical activity (MVPA) is beneficial for individuals with obesity given numerous related health benefits and its role in weight management. Yet, many individuals with obesity have difficulty accumulating sufficient MVPA to improve health, let alone higher amounts required to promote long-term weight control. Thus, novel strategies to help individuals with obesity adopt and sustain high MVPA levels are needed. While previous research has largely focused on conscious, reflective influences on MVPA (e.g., self-efficacy, perceived benefits) recent research also highlights the importance of nonconscious influences on MVPA, such as habit (i.e., automatic behavioral responses to environmental cues). However, no study has evaluated how markers of exercise habit (e.g., consistency in the time of day that MVPA is performed, consistency in other cues for exercise, exercise automaticity) relate to MVPA levels among individuals with prior overweight/obesity who have successfully maintained a large weight loss. Thus, the present study examined how temporal consistency of MVPA and other aspects of exercise habit relate to MVPA levels among successful weight loss maintainers enrolled in the National Weight Control Registry. Participants (n=375) reporting MVPA on ≥2 days/week completed measures of temporal consistency in PA (>50% of MVPA sessions/week occurring at the same time of day: during early morning, late morning, afternoon, or evening), PA levels, PA automaticity, and consistency in potential cues underlying PA habit formation (e.g., location, type of exercise). More than two-thirds of (68.0%) participants reported being temporally consistent exercisers: these individuals reported performing MVPA more frequently (4.8±1.7 vs. 4.4±1.5 days/week, p=.007) and for longer duration (400.9±282.6 vs. 348.5±271.2 MVPA minutes/week, p=.03), and were more likely to achieve the national MVPA guideline (≥150 minutes/week; 86.3% vs. 74.2%, p=.004), than temporally inconsistent exercisers. Among temporally consistent exercisers, nearly half (47.8%) were routine early morning exercisers. MVPA levels did not differ by specific time of day of routine MVPA performance among temporally consistent exercisers (p>.05). Greater exercise automaticity and greater consistency in several PA cues were related to greater MVPA among all participants (p<.01), especially with regard to MVPA days/week. Taken together, findings suggest that consistently exercising at the same time of day, regardless of if it is during the morning, afternoon, or evening, may help to explain characteristic high MVPA levels among successful weight loss maintainers. Greater consistency in other cues for exercise, such as consistency in the type of exercise performed and where exercise is performed, may also facilitate more frequent MVPA engagement, potentially through fostering increased exercise automaticity and habit. Future research is needed to clarify how the timing of MVPA and cue consistency may causally influence MVPA adoption versus maintenance, and to identify the most effective intervention strategies for building a strong exercise habit.

INTERNALIZING SYMPTOMS AND SLEEP OUTCOMES IN URBAN CHILDREN WITH AND WITHOUT ASTHMA

Paige Seegan, PhD, Sarah R. Martin, PhD and Daphne Koinis Mitchell, PhD

Study Objectives: This study examines associations between internalizing symptoms and sleep in a sample of urban children with and without asthma. We also investigate whether asthma status moderates these associations and whether associations differ by ethnic group.

Methods: Participants included urban children 7– 9 years old with (n = 259) and without (n = 122) persistent asthma from Latino, African-American (AA), and non-Latino White (NLW) ethnic group backgrounds. Teacher-reported internalizing symptoms (i.e., anxiety, depressive, and somatic) were assessed using the BASC-2. Sleep duration, variability in sleep duration, and sleep onset latency were assessed with actigraphy. Diagnosis of asthma was assessed by a study clinician according to clinical guidelines.

Results: Overall, higher levels of depressive symptoms were associated with more variability in sleep duration (B = .39, SE = .15, p = .007) and shorter sleep onset latency (B = -.17, SE = .06, p = .003). Additionally, higher levels of somatic symptoms were associated with more variability in sleep duration (B = .30, SE = .09, p = .001). By ethnic group, the most robust results were found among AA children in which higher levels of anxiety symptoms (B = .47, SE = .20, p = .017), depressive symptoms (B = .60, SE = .22, p = .006), and somatic symptoms (B = .38, SE = .15, p = .010) were associated with more variability in sleep duration. Among Latino children, higher levels of depressive symptoms were associated with shorter average sleep onset latency (B = -.29, SE = .09, p = .001). Among NLW children, higher levels of somatic symptoms were related to more variability in sleep duration (B = .48, SE = .19, p = .014). The associations between internalizing symptoms and sleep outcomes did not differ by health status in the whole sample; however, health status did matter when examining these associations by ethnic group. In AA children, health status moderated the association between levels of depressive symptoms and variability in sleep duration, in which higher levels of depressive symptoms were associated with more variability in sleep duration only in AA children with asthma (B = .94, SE = .28, p = .000). In NLW children, higher levels of somatic symptoms were associated with more variability in sleep duration only in NLW children without asthma (B = 1.33, SE = .47, p = .010).

Conclusion: Targeting specific internalizing symptoms and sleep outcomes may be beneficial in the development of interventions tailored for urban children with and without asthma from specific ethnic groups.

AA WOMEN'S RELATIONSHIP WITH THEIR MOBILE PHONE, AND WHAT THEY WANT IN A MHEALTH PA INTERVENTION

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Background: Mobile phone text messaging (TxM) is an emerging platform in physical activity (PA) interventions with African American (AA) women. Research on the relationship that AA women have with their mobile phone as well as their views of TxM as a potentially viable platform to help this group acquire and maintain PA is central in advancing this field of research. Both self-report measures and qualitative interviews may be helpful in this endeavor.

Methods: In the current study, a sample of 42 mostly physically inactive African American women (mean age=35 , SD= 10.25) completed the Mobile Phone Affinity Scale (MPAS), which measures factors that associated with mobile phone use. The MPAS consists of consists of six subscales, with three representing positive (Connectedness, Productivity, Empowerment), and three representing negative (Continuous Use, Anxious Attachment, Addiction) cognitions and behaviors are shown to underline patterns of mobile phone use. A semi-structured qualitative interview was conducted with twenty participants to assess their views of TxM technology as a potentially platform to help become and remain physically activity. Quantitative analyses included frequency and analyses of variance (ANOVAs) and assessed mobile phone use patterns and demographic differences based on the MPAS. Qualitative content analysis was conducted on participants' verbatim responses.

Results: Results indicated that participants overall endorsed the positive MPAS at a higher frequency compared to the negative constructs. Demographic differences were noted only for age and marital status for some of the MPAS subscales. Younger participants reported higher mean scores for of these MPAS subscales, Connectedness, (P=.005), Empowerment/Safety, (P=.04), Continuous Use, (P=.04), and Addiction (P=.004) in comparison to older participants. Moreover, single participants endorsed Connectedness, (P=.02) and Productivity, (P=.01) subscales at a significantly greater frequency than married participants. Qualitative data showed that 19 participants viewed TxM as an appealing platform to deliver daily motivational messages to increase PA engagement. Participants stated a TxM PA intervention would be convenient and motivating. However, most participants suggested other mobile phone applications in addition to TxM, to facilitate self-monitoring behaviors, including goal setting and activity tracking, to enhance mobile phone delivered interventions (mHealth) targeting AA women.

Conclusions: The study findings provide guidance in the development of mobile phone delivered physical activity intervention strategies that are likely to increase engagement and behavior change among physically inactive AA women.

SOCIODEMOGRAPHIC CHARACTERISTICS AND FAMILY PSYCHIATRIC HISTORY: IMPACTS ON DIAGNOSTIC UNCERTAINTY OF ASD

Danielle Sipsock, MD, Kayla Perkins, BA; Hasmik Tokadjian, MA; Giulia Righi, PhD; Stephen Sheinkopf, PhD

Objectives: Sociodemographic factors and parental mental health have been linked to increasing difficulties in accurately diagnosing ASD. This study investigates whether these characteristics are increased in participants where there is inconsistent evidence of ASD diagnosis.

Methods: The sample group comprised 700 individuals (ages 2.57–17.97 years; mean age = 10.4 years, SD = 4, 78.0% male) selected from a statewide ASD registry. Participants entered the registry with an existing diagnosis or because of concern of an ASD and were administered the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2) upon enrollment. Participants were grouped into diagnostic categories depending on the status of community diagnosis and ADOS-2 result as follows: 1) community ASD diagnosis and positive ADOS-2 (N = 477); 2) community diagnosis and negative ADOS-2 (N = 52); and 3) no community diagnosis and positive ADOS-2 (N = 171). Familial mental health history was obtained by caregiver report. Counts of mental illness diagnoses in first-degree relatives were summed to create a single variable representing the total number of diagnoses in participants' first-degree relatives.

Results: A one-way multivariate analysis of covariance (MANCOVA) was conducted with dependent variables of a first-degree family history of mental health disorders, participant mental health and medical comorbidities, and psychotropic medication use, with covariates of sex and age. There was a statistically significant difference between these groups [$F(12,1374) = 4.381$, $p < 0.001$]. Diagnostic discordant groups (groups 2 and 3) reported higher amounts of mental health family history, mental illness comorbidities, and psychotropic medication use compared with the concordant group (group 1). Diagnostic groups did not significantly differ on any measures of sociodemographic variables (distance from a tertiary hospital, maternal education, and neighborhood poverty characteristics).

Conclusions: An increased number of family mental health disorders and comorbidities are present in a community sample group of patients where the ASD diagnosis is uncertain. These findings support the need to carefully assess family and individual mental illness clinical presentations and consider their potential effect on ASD diagnosis and/or ADOS-2 interpretation, with particular regard to how this may impact service access and treatment outcomes.

OLFACTORY AND NEUROPSYCHOLOGICAL FUNCTIONING IN OLFACTORY REFERENCE SYNDROME

Channing Sofko, PhD; Geoffrey Tremont; Jing Tan; Holly Westervelt; David C. Ahern; William Menard; Katharine A. Phillips

Background: Olfactory reference syndrome (ORS) is an understudied psychiatric disorder characterized by a prominent preoccupation with a false belief of emitting an offensive body odor. Since this condition has only recently been recognized in major diagnostic manuals, little empirical evidence exists about the underlying features and etiology of the disorder. Purpose: To examine the neuropsychological and olfactory functioning of individuals with ORS and address whether there is underlying CNS or sensory dysfunction associated with the condition. Method: In this preliminary investigation, 9 participants with ORS completed a structured clinical interview and neuropsychological and olfaction evaluations. Results: Individuals with ORS display deficits in processing speed, executive functioning, and emotional processing. Furthermore, they displayed a recall bias for olfactory-related words, and deficits in odor detection and odor discrimination. Conclusions: Based on findings of cognitive, olfaction, and emotional processing deficits in individuals with ORS, a number of brain structures may be involved. Specifically, the results suggest possible involvement of the anterior-dorsal ascending branch of the left superior temporal sulcus and the left dorsolateral prefrontal cortex. Furthermore, exploration of possible frontotemporal hypoperfusion should be explored.

INTEGRATED CUE-REACTIVITY PARADIGM TO ASSESS CRAVING AND SELECTIVE ATTENTION TO SIMULTANEOUS ALCOHOL AND SMOKING CUES: A PILOT HUMAN LABORATORY STUDY

Rachel Souza, ScM, James Wilmott, Victoria M Long, Kimberly Goodyear, Joo-Hyun Song, Robert M Swift, Molly Magill, Elizabeth Aston, Carolina Haass-Koffler

Background
Alcohol and cigarettes are commonly used together and >80% of individuals with an alcohol use disorder (AUD) are also smokers. We developed a novel paradigm combining an integrated cue reactivity procedure that included simultaneous presentation of real alcohol and cigarettes cues with an eye tracking experiment using virtual cues. By quantifying the behavior towards real substances in a bar laboratory and attention bias via gaze preference towards virtual substances in an eye tracking laboratory, we assessed selective addictive-behavioral responses in heavy drinking smokers.

Methods
This was a pilot human laboratory study (n=32) with heavy drinking smokers who completed both a cue-reactivity (CR) session and an eye tracking (ET) session where their preferred alcoholic drink and cigarette brand were presented simultaneously as real cues and virtual cues. In the CR session, we measured time spent with each substance and craving for each substance. In the ET session, we measured time spent looking at each substance and the first substance that caught the gaze of the participants.

Results
Alcohol craving is greater than cigarette craving both in individuals who self-reported an alcohol preference ($r(29)=0.103$, $p<0.05$) and in those who self-reported a cigarette preference ($r(29)=0.006$, $p<0.05$). Time spent interacting with alcohol during the CR session is correlated to time spent fixating on alcohol during the ET session ($r(29)=0.377$, $p<0.05$).

Conclusions
The integrated cues CR procedure combined with an ET experiment provided a useful tool to measure addictive-related behaviors in heavy drinking smokers. This pilot work may represent a tool that can be used to develop personalized therapies for individuals with co-use addictive disorder.

EXAMINING MOTIVATIONAL PATHWAYS FROM ADHD TO CANNABIS: RESULTS FROM A PROSPECTIVE STUDY OF VETERANS

Angela Stevens, MA, MPH, Rachel Gunn PhD, Kristina Jackson PhD, Brian Borsari PhD, and Jane Metrik PhD

Adult attention deficit hyperactivity disorder (ADHD) has received recent attention in research and has been associated with increased risk for substance misuse. Evidence suggests that cannabis is the most commonly-used substance among individuals with ADHD, though research demonstrates deleterious effects of cannabis on attention and cognitive processing. To clarify this association, we examined the prospective relations between adult ADHD and cannabis use and related problems 12-months later among a sample of Veterans deployed post-9/11/2001 (N=361). Reasons for using cannabis were examined as potential mechanisms of these relations. In single mediation models, relations between baseline ADHD and 12-month cannabis use were fully mediated by using cannabis to cope (e.g., "to forget your problems"), perception of low risk (e.g., "because it is not a dangerous drug"), and for sleep (e.g., "because you are having problems sleeping"). In a multiple mediator model, sleep emerged as the only significant mediator, even after adjusting for past-month post traumatic stress disorder and major depressive disorder diagnoses ascertained at baseline. Thus, sleep may play a unique role in the relationship between adult ADHD and cannabis use. These prospective associations have significant research and clinical implications.

CONTEXTUALIZING AND TESTING MINORITY STRESS AMONG CHINESE SEXUAL MINORITY MEN: FINDINGS AND IMPLICATIONS FOR HEALTH RESEARCH AND INTERVENTIONS

Shufang Sun, PhD, Stephanie Budge, William T. Hoyt, John Pachankis, Laura Whiteley, Larry Brown

Sexual minority men (SMM) in China are disproportionately affected by the growing HIV epidemic and psychological distress. Although research based on largely Western-based samples suggests a minority stress perspective to explain health disparities for sexual minorities, how Chinese SMM experience identity-related stress and how such experiences affect their mental and behavioral health have not been carefully examined. This presentation will summarize a comprehensive research project we conducted in China (supported by research award to the first author), including both qualitative and quantitative research methods that resulted in four papers in press and under-review. Specifically, through grounded theory based qualitative work, a conceptual model of minority stress was developed to capture the cultural, social, and psychological processes of minority stress, their impact on psychological and behavioral health, and coping mechanisms. Our quantitative research focused on HIV testing, sexual risk behaviors, and mental health. Specifically, we found that initial HIV testing related to one's HIV knowledge and risk awareness, while regular testing was best predicted by sexual identity-based concerns (internalized homophobia and concealment motivation). Analysis of sexual risk behaviors revealed that number of sex partners related to online socialization and perceived stigma, while condomless anal sex associated with enacted stigma experiences related to one's sexuality. In a structural equation modeling analysis using minority stress and culture factors to understand mental health, we found that sexual identity negativity was related to both cultural values (i.e., norm conformity) and interpersonal victimization, while mental health issues were not related to identity negativity but with interpersonal victimization and familial support. In summary, our research findings suggest the relevance of minority stress as well as a context-centered, relational oriented approach of conceptualizing minority stress among Chinese sexual minority men. Limitations and implications for HIV prevention and mental health research with this population are discussed.

PERSISTENT FIRING IN PARVALBUMIN AND SOMATOSTATIN EXPRESSING NEOCORTICAL INTERNEURONS

Brian Theyel, MD, PhD, Stevenson RJ, Connors BW

A basic property of axons involves their ability to propagate action potentials in both orthodromic ("forward") and antidromic ("backward") directions, e.g. (Brain Res Rev. 21:42, 1995). While spikes are typically generated in axon initial segments and propogate orthodromically, they have been known to be initiated elsewhere in the axons in certain cases, which the literature generally refers to as 'ectopic' action potentials. Recently, ectopic spiking has been demonstrated primarily in NPY-expressing interneurons of the hippocampus (Nat Neurosci. 14:200, 2011), whereas few parvalbumin-expressing interneurons (PV+ cells) generated ectopic spikes. We (Theyel, et al. in prep) have observed that a large majority (70/73) of PV+ cells in both orbitofrontal and somatosensory cortices are not only capable of generating ectopic action potentials after they've been sufficiently activated, but do so in varying patterns for up to tens of seconds. We also demonstrated that somatostatin positive interneurons (7/8) and even a few pyramidal cells were capable of ectopic spiking, but only up to a handful of spikes, and only after highly intense stimulation not likely to be possible in an awake behaving animal's brain. PV+ cells, often referred to as "fast-spiking" interneurons, had a much lower initiation threshold for ectopic spikes, requiring a few hundred spikes over the course of tens of seconds, and often (~75% of the time) fired trains of ectopic action potentials rather than just one or a handful. Given PV+ cells' strong inhibition onto excitatory cells, and their role in generating network gamma rhythms, ectopic spiking may have significant implications for network activity and cognitive processing. Several studies have implicated abnormalities in PV+ interneurons in schizophrenia (J Neurosci, 29:8, 2344-2354; Trends Neurosci, 35(1), 57-67) and Autism Spectrum Disorder (PLoS One, 10(3), e0119258; Mol Psychiatry, 20(10), 1161-1172). Our future work will focus on whether ectopic spiking behavior changes in PV+ interneurons of animal models of both disorders.

PARENT-ADOLESCENT RELATIONSHIP CHARACTERISTICS AND ADOLESCENT CANNABIS USE: A GROWTH CURVE ANALYSIS

Sarah Thomas, PhD, Leslie Brick, Ph.D., Lauren Micalizzi, Ph.D., Anthony Spirito, Ph.D.

BACKGROUND: Cannabis use in adolescence is associated with serious consequences, including poor academic functioning and disrupted brain development. Moreover, about 17% of individuals who initiate cannabis use during adolescence become addicted. Characteristics of the parent-adolescent relationship, including parenting style, warmth, and monitoring, have been linked to adolescent substance use, both as risk and protective factors. For example, lower parent-youth relationship quality has predicted adolescent cannabis initiation (Rusby et al., 2018), and frequency of positive parenting behaviors is inversely related to youth cannabis use (King et al., 2015). Specifically, parent-adolescent attachment characteristics are also related to substance use such that lower quality is related to greater likelihood of substance use (Hayre et al., 2019), while greater attachment quality has been identified as a protective factor (McLaughlin et al., 2016). Adolescent substance use, a form of externalizing behavior, may affect the parent-adolescent relationship over time via parents increasing their control through discipline, which increases conflict, negatively impacting relationship quality. In this study, we investigated the time-varying associations between adolescent-reports of weekly cannabis use and parent-reports of relationship quality. We hypothesized that adolescent cannabis use would be inversely related to parent-adolescent relationship quality over time.

METHOD: Participants were 108 adolescents (mean age=15.7 years; 43.5% female), recruited from a relatively diverse community mental health clinic in the context of an adolescent substance use treatment study, and their caregiver ("parent"). Participant inclusion criteria were: (a) between 12-18 years old, (b) diagnosed with an alcohol or cannabis use disorder (DSM-IV), (c) English speaking, and (d) qualified for intensive outpatient treatment. Participant exclusion criteria were: (a) serious psychiatric symptoms (e.g., hallucinations), (b) acutely suicidal or homicidal, and (c) exhibited violent behavior at time of screening. Using MPlus with full information maximum likelihood to account for missing data, we investigated the time-varying associations between adolescent-reports of weekly cannabis use (number of days used) and parent-reports of relationship qualities including relational frustration, discipline, and attachment at baseline, 3-month, 6-month, and 12-month follow-up. Two estimates investigated were the intercept (initial status of characteristic/behavior), and the slope (rate of change). There were 77 adolescents (mean age=15.8 years; 41.6% female) with relationship quality reports over time. Covariates were treatment group (experimental or treatment-as-usual), age, and sex.

RESULTS: At baseline, average cannabis use was 1.92 days per week. Results indicated an overall significant increase in weekly cannabis use across time, slope = 0.37, p = 0.002. Relational frustration was associated with greater cannabis use at 3- and 6-months follow-up. At 12-months, lower parental attachment was associated with greater cannabis use. Discipline had no effect on cannabis use. There were no significant baseline differences in weekly cannabis use associated with treatment group, age, or sex. However, results indicated that older youth had a steeper increase in cannabis use.

CONCLUSIONS: We found parent-reported relationship quality to be related to adolescent weekly cannabis use over time. Findings suggest that parent relational frustration covaries with adolescent cannabis use at earlier timepoints, while at 12 months greater cannabis use is associated with reduced parent-reported attachment. Initiating cannabis use in adolescence confers vulnerability to addiction; therefore, investigating factors related to cannabis use, like family processes, may enable more effective, targeted treatments, to be developed.

AN EXPLORATION OF PSYCHOTHERAPY READINESS AMONG PSYCHIATRICALLY HOSPITALIZED ADOLESCENTS WITH NEWLY IDENTIFIED PSYCHOSIS-SPECTRUM DISORDERS

Elizabeth Thompson, PhD, Anthony Spirito, Jennifer Wolff

Background: Psychosis often emerges in late adolescence, and many individuals report a period of months to years during which psychotic-spectrum experiences increase in frequency, intensity, and interference before receiving appropriate care. With growing attention to the early stages of psychosis, early intervention initiatives are becoming increasingly available to address early signs of illness and mitigate risk. Psychosocial interventions employed during the prodromal "pre-psychotic" phase have been consistently linked to positive outcomes. Despite the field's growing understanding of this population and their needs, and the promising outcomes linked to early care, many youth do not receive treatment for these experiences until full-threshold psychosis emerges. One important factor associated with treatment use and engagement is the individual's attitude toward treatment. Little is known about how adolescents with emerging psychosis symptoms view mental health treatment in their early contacts with mental health professionals.
Methods: This study sought to explore psychotherapy readiness in relation to psychosis-spectrum experiences among adolescents admitted to a psychiatric unit for acute safety concerns. Participants included 389 adolescents admitted to the inpatient unit at Bradley Hospital, all of whom completed a brief diagnostic interview (including assessment of psychosis), the Readiness for Psychotherapy Index (RPI), and a psychosis-spectrum questionnaire (the PRIME Screen) upon intake.
Results: A total of 74 participants were determined to meet criteria for a psychosis-spectrum disorder (PSD). The remaining 315 adolescents demonstrated a similar level of acuity and presented with a variety of mental health concerns, not including psychosis. Scores on the RPI were compared across adolescents with PSDs and those without. The PSD group had significantly lower scores on the Overall Readiness scale. Three of the four RPI subscales differed significantly across groups, with the PSD group demonstrating higher scores on the Distress subscale and lower scores on the Perseverance and Openness scales. There were no significant differences in scores across groups on the Disinterest subscale. Scores on the RPI were explored in relation to specific psychosis-spectrum symptoms (e.g., paranoia, auditory hallucinations), as endorsed on the PRIME. Results indicate that certain symptoms may be differentially linked to specific components (i.e. subscales) of psychotherapy readiness.
Discussion: The PSD group endorsed significantly lower scores on the Perseverance subscale, indicating a lower willingness to work in therapy (less readiness for psychotherapy) than the comparison group. On the Distress subscale, PSD adolescents endorsed greater concern for their mental health problems. On the Openness subscale, PSD adolescents reported less willingness to discuss personal experiences with a therapist. These findings indicate that adolescents with PSDs are reporting greater distress related to their mental health in comparison to psychiatric peers, however, they may also be less willing to be open and work in therapy. Interestingly, the PSD group also reported less agreement that their problems will go away on their own. Specific symptom presentations are also discussed in relation to RPI components. Findings from this study warrant further discussion and exploration, as the attitudes and beliefs behind these findings may have significant implications for treatment engagement strategies and interventions for this high-risk population.

DCTclock™ VERSUS MANUAL 10-POINT SCORING METHOD IN PREDICTING AMYLOID BURDEN AND MEMORY PERFORMANCE IN HEALTHY OLDER ADULTS WITH SUBJECTIVE COGNITIVE COMPLAINTS

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Background: Developing neuropsychological assessment tools sensitive to subtle cognitive changes during the preclinical stages of AD is imperative for the advancement of prevention focused treatment approaches. The digital clock drawing test (DCTclock, Digital Cognition Technologies) is a promising new tool for capturing detailed information about spatial ability, processing speed, and organization, with shown sensitivity to subtle cognitive impairment (Rentz et al., 2017). We compare DCTclock variables to the traditional hand-scored 10-point system (Rouleau et al., 1992) in the prediction of word list memory performance and amyloid burden after 27 months in a longitudinal study of individuals with subjective memory impairment (SMI). Methods: 20 adults (mean age = 63 years) with SMI and first degree family histories of AD were followed for 27 months. PET SUVr in the Anterior Cingulate Cortex (ACC) and performance on the delayed free recall portion of the 16-item International Shopping List Test (ISLTDR, Cogstate) at 27 months served as our outcome variables. For each outcome variable, three general linear models were constructed to test DCT Total Score (DCTTS), Spatial Reasoning Score (DCTSRS), and hand-scored total score (HSTS; out 10 points), respectively, at baseline as independent predictors. Correlations between HSTS and a range of DCT variables were also examined. Results: HSTS was positively correlated with DCTSRS, $r(18) = .56$, $p < .01$, but not other DCT variables (e.g., Total Score, Efficiency, or Drawing Time). DCTTS positively predicted ISLTDR, $R^2 = .19$, $F(1, 18) = 4.53$, $p < .05$, but not SUVr. DCTSR negatively predicted SUVr, $R^2 = .26$, $F(1, 18) = 6.28$, $p < .05$ and positively predicted ISLT DR, $R^2 = .22$, $F(1, 18) = 5.37$, $p < .05$. HSTS did not account for significant variance in either SUVr or ISLTDR, but results trended in the same direction as the DCTSR models. Conclusions: Despite our small sample size, baseline Spatial Reasoning performance on DCTclock was a robust predictor of amyloid burden in the ACC and delayed recall memory performance at 27month followup, whereas the hand-scored clock variable was not. Our findings add support for DCTclock as a suitable tool for identifying early cognitive changes in individuals at risk for AD.

CAN EARLY TREATMENT RESPONSE SERVE AS A PREDICTOR OF ANTIDEPRESSANT OUTCOME TO REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS)?

Eric Tirrell, BA, Quincy Beck, Fatih Kokdere, Linda L. Carpenter, MD

Background: Transcranial Magnetic Stimulation (TMS) is an effective treatment modality for Major Depressive Disorder (MDD). Expert guidelines recommend that a course of TMS treatment for MDD should comprise up to 30 or more daily sessions occurring over a span of 6 or more weeks. Having a reliable way to tell early on which patients will not eventually benefit by continuing a full course of treatment could potentially save them the time and resources associated with additional weeks or months of exposure to that ineffective treatment. Efforts have been ongoing to identify early symptom improvement models for prediction of antidepressant response to pharmacotherapy trials as well as to TMS therapy trials. One large retrospective study reported negative predictability values (NPVs) of over 88% in patients receiving a course of 20 TMS treatment sessions, using degree of improvement on depression symptom scales after sessions 5 and 10 as early indicators of response. The current tests the predictive models from Feffer et al (2018) in data from the Butler TMS clinic, where the course of TMS therapy is routinely extended beyond 20 sessions.
Methods: Total scores on the Inventory of Depressive Symptomatology Self Report (IDS-SR) scale from patients treated at Butler Hospital's TMS clinic from 2009-2019 were reviewed in a 248 de-identified dataset. Change in depression severity was measured by IDS-SR based on percent reduction from pre-treatment baseline score to the score at end of week 1 (5 sessions), week 2 (10 sessions). Scores at week 4 (20 sessions) and scores after the final treatment in the series (typically after session #36) were used to determine outcomes. Non-response was defined by <50% change in scores, relative to pre-TMS baseline. Using MATLAB R2017a, prediction models of TMS non-response (based on either 10% or 20% threshold improvement at week1 or week 2) were tested and quantified in confusion matrices.
Results: For all parameters tested, NPVs were lower when overall outcome was determined using final scores vs. those collected at week 4. Patients with <20% score improvement by week 2 were predicted to be non-responders with 72.3% accuracy when using final scores, and 93.1% accuracy when using week 4 scores. Similarly, using a more stringent <10% score improvement at week 2 to predict non-response, NPVs were 76.8% and 95.1% when using final scores and week 4 scores, respectively.
Conclusion: On an individual patient basis, the ability to reliably predict treatment outcomes with early indicators could be a valuable tool for avoiding non-efficacious courses of treatment. Earlier work suggested that lack of traditional response to 20 TMS treatments could be predicted with 88.2% precision if the patient didn't achieve >20% improvement by week 2. In our population, the NPV was 93.1% using that same predictor model, which means that 93% of the time, we could correctly predict that a given patient in our clinic would fail to benefit from a 20-session course of TMS therapy. However, NPVs sharply dropped by 20.8% when the course of treatments was extended beyond week 4, i.e., we could only be correctly forecast a bad TMS outcome (non-response) 72.3% of the time. These findings suggest that predictions of non-response to TMS based on early improvement are not as accurate when more sessions are available (beyond #20). These findings are consistent with results from several prospective trials showing more patients get better with TMS when the course of daily treatments is extended beyond a limit of 4 or 6 weeks (20-30 sessions). Depressed patients who do not experience symptom benefit during the first few weeks should be encouraged to continue a longer course of TMS therapy.

USE AND IMPACT OF PSYCHOTROPIC MEDICATIONS DURING TRANSCRANIAL MAGNETIC STIMULATION (TMS) THERAPY FOR MAJOR DEPRESSIVE DISORDER (MDD)

Eric Tirrell, BA, Quincy Beck, Fatih Kokdere, Linda L. Carpenter, MD

Background: Large regulatory trials of Transcranial Magnetic Stimulation (TMS) for Major Depressive Disorder (MDD) required participants to be medication free, but in real-life clinical practice, patients undertaking a course of TMS are almost always on concurrent psychotropic medications from a variety of pharmacological classes. Very limited data exist to help clinicians understand the role of medications on MDD treatment outcomes during TMS therapy.
Methods: De-identified data from 307 patients treated in the Butler TMS Clinic from 2009 – 2018 were analyzed. Concomitant psychotropic medications were coded into 11 commonly referenced categories based on their pharmacological actions (or class) to explore effects on TMS Therapy outcomes. The Inventory of Depressive Symptoms Self-Report (IDSSR) and Patient Health Questionaire-9 item (PHQ9) scales at baseline and treatment endpoint were evaluated, with "response" characterized by $\geq 50\%$ change in score (relative to baseline) on PHQ9 or IDSSR and "remission" defined by endpoint scores (<14 on the IDSSR and <4 on PHQ9); Percent change (relative to baseline) was used as a continuous predictor variable. All patients completed a standard course of treatment (typically 36 sessions over 9 weeks) with stimulation delivered to the left DLPFC. Chi-square tests and linear regression model analyses were performed using SPSS with significance $p<0.05$.
Results: 14 patients (4.5%) of the sample were on no concurrent medications during TMS and 293 (95.5%) were taking more than one psychotropic agent. Using IDSSR categorical outcomes only, TMS patients on concurrent atypical antipsychotics had lower response and remission rates ($p=0.032$ and $p=0.042$, respectively). However, neither atypical antipsychotics, nor any of the other 11 medication categories we examined was found to be a significant predictor of outcome in models controlling for clinical variables such as past history of ECT, prior psychiatric hospitalizations, sex, and baseline severity. Having no concurrent medications, as well as the concurrent use of multiple psychotropic agents from different categories, was both found to be unrelated to TMS outcomes.
Conclusion: This retrospective review of the effects of concurrent psychopharmacology on TMS therapy outcomes for depression confirmed that no specific category of medication predicted better or worse outcomes. A number of clinical researchers have assumed that concurrent use of anticonvulsant agents or benzodiazepines portend worse TMS therapy outcomes, perhaps because those agents tend to diminish excitability of the motor cortex. While a trial involving prospective, randomized assignment of patients to specific concurrent medication classes during their course of TMS is not likely to be a feasible approach, a larger sample size and greater division of medication into subgroups groups based on their pharmacological mechanisms may have detected effects or uncovered significant associations not revealed by our medication classes. In summary, our data do not suggest that depressed patients undertaking a course of TMS should preferentially initiate or discontinue certain medications to get the best possible effect from TMS therapy.

DEALING WITH DISTRESS: COGNITIVE CORRELATES OF COPING STRATEGIES IN YOUNG CHILDREN WITH ASD

Hasmik Tokadjian, MS, McCormick, Carolyn E. B. & Sheinkopf, Stephen J.

Background. Individuals with Autism Spectrum Disorder (ASD) have difficulty establishing effective emotion regulation skills and consequently experience behavior problems (Sofronoff et al. 2007). Common coping strategies identified in literature on typical development are described as constructive/goal-oriented, venting, and passive/avoidance, and have shown both direct and indirect effects on positive and negative outcomes (Eisenberg et al., 1993; Blair et al., 2004). Although there is some evidence to support the relation between cognitive ability and the regulation of emotions (Mazefsky et al., 2013), research is limited in addressing how specific elements of cognitive functioning impact coping behaviors.

Objectives. The aim of this study was to compare types of coping strategies used in a heterogeneous sample of children with ASD, and explore the way in which varying levels of IQ may influence their use of coping strategies.

Methods. Participants were 83 children, 48 with ASD and 35 typically developing controls (age range 2–7; M= 4.23 years, SD= 1.15, 77% male). IQ was assessed using the Stanford Binet-5. The ASD participants were split into two subgroups based on expressive language: low verbal (up to basic phrase speech; N =33) and high verbal (verbally fluent; N = 15). Participants were presented with a series of tasks that were designed to be frustrating (e.g. toy with a broken part). Coping strategies during these tasks were coded as: instrumental, avoidance, aggression, disruption, venting, social-monitoring, and support-seeking (Eisenberg et al., 1993; Marcelo & Yates, 2014).

Results. The strategies were summed to create three composite variables of positive strategies (instrumental, social-monitoring, and support-seeking), negative strategies (aggression, disruption, and venting), and avoidant strategies (avoidance; Jahromi et al., 2012; Zantinge et al., 2017). There was a significant difference in coping strategies based on group (F(6, 156)=10.24, p< .001). The ASD low verbal group used less positive strategies compared to the ASD high verbal and typically developing groups (p=< .001). The ASD low verbal group used more negative strategies compared to the typically developing group (p=.047). In addition to the group differences, moderation analyses within the ASD group revealed a significant two-way interaction between non-verbal IQ and high versus low verbal ability (β=-.432, p=.043). Higher non-verbal IQ scores predicted greater use of positive coping strategies for the low verbal ASD group (simple slope= -.016, p=.008). There were no significant interactions between verbal or full scale IQ and verbal ability predicting positive, negative or avoidant coping strategies.

Conclusions. Children with ASD and low verbal ability displayed fewer positive coping strategies during frustrating events compared to their peers. However, within this group higher non-verbal ability was associated with more positive coping strategies. Thus, non-verbal cognitive functioning may have a protective effect, supporting the expression of constructive coping strategies. This suggest that individuals who appear to be significantly impaired can demonstrate effective coping in the face of challenging situations. These findings are important for continuing to explore the mechanisms by which stressful experiences influence behavior and what factors may or may not lead to more positive outcomes in children with ASD.

MATERNAL EDUCATION, ECONOMIC STRESS, AND AUTISM SPECTRUM DISORDER: FINDINGS IN A STATE-WIDE COMMUNITY SAMPLE

Monica Treviño, BA, Rebecca Bradley, Elaine Clarke, Giulia Righi, Stephen Sheinkopf

Background: Across the lifespan, families of children with autism spectrum disorder (ASD) face significant health and education-related expenses (Lavelle 2014). This is compounded by the potential effect of an ASD diagnosis on parental employment. There is evidence that mothers of children with ASD may reduce working hours or cease employment permanently as a result of their children's diagnosis (Leiter 2004) and may earn significantly less than mothers of children without any health limitations (Cidav 2012). Annual incomes of families affected by ASD may be significantly lower than families not affected by ASD, particularly when parental education and other demographic factors are considered (Montes 2008).

Objectives: To compare percentages of maternal education and financial stress in families affected by ASD using the Rhode Island Consortium for Autism Research and Treatment (RI-CART) with maternal education and financial stress in typical Rhode Island families.

Methods: This study analyzed data from families enrolled in RI-CART, a state-wide community-based sample. RI-CART participants came from varied racial and socioeconomic backgrounds. Enrollees completed demographic surveys as well as behavioral and cognitive measures. Participants included in this analysis (n = 998) had a formal diagnosis and/or met criteria on a standardized diagnostic assessment (ADOS-2). Rhode Island educational attainment and financial stress data were derived from the 2016 U.S. Census and the Kaiser Family Foundation.

Results: The average educational attainment of mothers in the RI-CART sample was significantly higher than that of the general population of Rhode Island. 92.4% of mothers in the RI-CART sample had a high school diploma or higher, compared to 85.4% of adults in Rhode Island (χ^2=20.4, p<.001), and 47.9% of mothers reported having a standard college degree or higher, compared to 30.0% of adults in Rhode Island (χ^2=158.0, p<.001). Only 9.3% of RI-CART families reported annual incomes below the federal poverty line—this was significantly lower than the 13.0% of Rhode Island families below the poverty line (χ^2=10.6, p<.001). In contrast, 29.7% of RI-CART families reported economic stress, as defined by annual incomes below 200% of the federal poverty line. This was significantly higher than the 26.0% of families in Rhode Island with annual incomes below 200% of the federal poverty line (χ^2=6.2, p<.001). Further analyses will examine potential predictors of discrepancies between maternal education and household income.

Conclusions: Despite mothers in the RI-CART sample achieving significantly higher levels of educational attainment than adults in Rhode Island, RI-CART families reported significantly higher rates of economic stress. These results support previous findings that families of children with ASD experience greater economic stress than families of typically developing children. Due to lack of adequate care, absence of accommodations in the average workplace, and/or poor support services, families affected by ASD face difficult choices regarding employment that may severely limit their earning potential. Providers, policymakers, and other state and federal community-stakeholders must consider the substantial expense and caregiver burden associated with raising a child with ASD when evaluating current resources, health care systems, and policies for families affected by ASD (Mandell 2012).

BROWN'S NIMH-FUNDED RESEARCH TRAINING PROGRAM FOR PSYCHIATRY RESIDENTS: OVERVIEW AND 2018-2019 UPDATE

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In 2013, Brown University's Department of Psychiatry and Human Behavior was awarded a R25 grant from the National Institute of Mental Health (NIMH) to support research training of our psychiatry residents. This grant has substantially increased opportunities for our residents to conduct high-quality, cutting-edge research to prepare them for successful careers as physician-scientists in psychiatry and neuroscience. The R25-supported Research Training Program (RTP) provides residents with intensive research training at a critical point in their careers, with the goal of increasing the number and preparedness of psychiatrists who conduct innovative research in translational, basic, or clinical areas.

The RTP combines an intensive longitudinal mentored research experience with an individualized research-focused didactic curriculum and career development activities. Residents have protected time for research beginning in the first PG year and increasing up to 80% in PGY4. RTP activities are integrated with Brown's four-year residency program so that RTP residents meet all ACMGE and American Board of Psychiatry and Neurology requirements. RTP residents are mentored by outstanding faculty who are conducting innovative research and are carefully matched with residents' specific research interests. This poster highlights the key components of the RTP program and provides an update on residents' research projects and accomplishments, as well as current appointments of recent RTP graduates.

RTP residents have been very productive in terms of publications and presentations, have received support to attend and present their findings at national conferences, and have received numerous travel, poster, and other research awards. RTP residents have secured >$600,000 in grant funding, and graduates have been very successful at securing academic and fellowship positions with >=50% protected time after residency.

In summary, our NIMH-supported RTP has substantially enhanced our residents' research training experience by capitalizing on support provided by the R25 grant, high-caliber research mentorship, and strong institutional support at Brown. Institutional prioritization of psychiatry and brain science, our department's cross-disciplinary collaborations, and our faculty's productivity and longstanding commitment to research mentoring are ensuring that our residents have an exceptional research training experience.

ACCEPTABILITY & FEASIBILITY OF A PEER-FACILITATED PHYSICAL ACTIVITY INTERVENTION FOR PATIENTS IN METHADONE MAINTENANCE TREATMENT

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Background: Methadone maintenance treatment (MMT) is the most widely used harm-reduction approach to treating OUD in the United States, with clinics delivering methadone to approximately 300,000 OUD patients every day. While MMT has been effective in improving opioid use outcomes, the overwhelming majority of patients continue to engage in unhealthy lifestyles and experience rates of physical and mental health comorbidities significantly higher than those of the general population. Given the known health benefits of physical activity (PA), interventions targeting increases in PA in MMT populations could significantly impact overall morbidity in these individuals. Peer-facilitated PA interventions have shown impressive results for initiating and maintaining increases in PA across varied populations with chronic health problems, but none have been tested for individuals with substance use disorders. Methods: We developed and pilot-tested a 12-week peer-facilitated PA intervention delivered in the context of MMT. The Peer-PA intervention included: 1) weekly PA discussion groups led by trained MMT clients, 2) peer-led walking groups and 3) Fitbit activity tracker to facilitate self-monitoring of PA. Key milestones of feasibility and acceptability—including session attendance, use of Fitbit tracker, adverse events, and participant satisfaction—were examined. Results: Twenty-six (n=26; 73% female; 41.2 years old; 80% unemployed or on disability) low-active MMT clients enrolled in the 12-week Peer-PA program. N=24 (92%) completed the end-of-intervention assessment. There were no serious adverse events related to study participation. Most participants (86.7%) reported that it was helpful to have a peer from the methadone clinic facilitate PA groups. All participants (100%) enjoyed the group walks. Most participants (96%) were satisfied with the use of the Fitbit tracker. Over the course of the 12 weeks, participants wore the Fitbit on average 8.2 weeks. On average, participants attended 65% of eligible intervention sessions, which was below our 70% benchmark. Reasons for lack of attendance included relapse to opioids and cocaine, unrelated health issues (psychiatric inpatient hospitalization, flu, oral surgery, leg injury), and time spent in jail after initiating the program. Conclusion: Indicators of feasibility and acceptability suggest that a peer-facilitated PA intervention can be incorporated in the context of MMT. While we did not meet our a priori milestone for attendance, a review of recent literature showed that it is comparable (and in some cases, higher) to other behavioral intervention studies with this population. We have implemented various strategies to improve session attendance in a preliminary RCT of the intervention which is currently underway.

DOMESTIC VIOLENCE, PARENTING STRESS, AND INFANT EXTERNALIZING AND INTERNALIZING BEHAVIOR PROBLEMS

Lauren Wallace, Ronald Seifer, Stephanie Parade

Three out of ten women are victims of domestic violence in the United States each year, and nearly a third of children will be exposed to domestic violence by the time they reach adulthood. Domestic violence includes any form of physical, sexual, or psychological violence perpetrated by one romantic partner to the other that can pose negative mental and physical health consequences to the victim and their child. Although it is well understood that domestic violence is damaging to children's mental health, less is known about the mechanisms by which domestic violence contributes to infant behavioral development. Thus, the current study explored the effect of exposure to domestic violence within the first six months postpartum on externalizing and internalizing behaviors at one year of age, and tested parenting stress as a mediating mechanism.

Two hundred and ninety-five mothers and their infants were recruited from WIC sites in Rhode Island to participate in a larger study of maternal adversity and maternal-child health. Mothers were racially and ethnically diverse (40% Hispanic; 42% White, 19% Black, 7% Biracial, 32% other races) and were between the ages of 18 and 44 (M = 26 years). 61% of mothers had received less than or equal to a high school degree, 66% stated they were unemployed during pregnancy, and 44% of participants were first time mothers. 54% of infants were female.

Mothers were asked to report on domestic violence (Conflict Tactics Scales-Short Form; Straus, Hamby, Boney-McCoy, & Sugannan, 1996), parenting stress (Parenting Stress Index; Abidin, 1995), and their infant's behavior problems (Brief Infant Toddler Social Emotional Assessment; Briggs-Gowan, Irwin, Wachtel, Carter, & Cicchetti, 2004). Simple correlations and bootstrapping procedures to test indirect effects were used for data analysis.

Maternal exposure to physical assault and maternal exposure to psychological aggression were associated with infant externalizing, but not internalizing, behavior problems (r = .22, p = .025 and r = .32, p = .001, respectively). Maternal exposure to physical assault, but not psychological aggression, was associated with parenting stress (r = .16, p = .038). In turn, parenting stress was associated with both internalizing and externalizing behavior problems (= .30, p = .003 and r = .24, p = .015, respectively). There was an indirect effect of physical assault on internalizing problems, but not externalizing problems, through parenting stress (B = .28, SE = .18, CI: .02 to .85).

Results suggest that maternal exposure to domestic violence, specifically physical assault and psychological aggression, is associated with infant mental health at one year of age. Maternal parenting stress was a mechanism linking physical assault with infant internalizing behavior problems. Direct effects were observed between both indicators of domestic violence and externalizing behavior problems. Our findings extend past literature by explaining how domestic violence interferes with healthy infant behavioral development. Identifying and supporting mothers exposed to domestic violence is important for supporting infant mental health and the maternal-child relationship.

GENERATION AND CHARACTERIZATION OF A TRANSGENIC MODEL OF 17q12 DELETION SYNDROME: A NOVEL MOUSE MODEL OF POLYGENIC AUTISM SPECTRUM DISORDER

Emily Warren, PhD, Daniel Moreno De Luca, Eric Morrow

Copy number variants (CNVs), contiguous gene deletions or duplications, have been identified as causal factors in up to 7 percent of autism spectrum disorder (ASD) cases with a known genetic etiology. CNV loci have been identified on nearly every chromosome, and many recurrent CNVs involve polygenic interactions. Thereby, CNVs offer a powerful opportunity to investigate multigenic inheritance in neurodevelopmental mechanisms central to the causes and treatments of ASD. At the 17q12 locus, a 1.4Mb region which includes 15 genes, deletion and duplication CNVs have been identified. The deletion has been associated with a range of neurodevelopmental disorders, as the deletion has been discovered in patients with ASD, developmental delay, and mood disorders. The 17q12 deletion is also associated with somatic pathology – renal cysts and diabetes (RCAD) syndrome, as well as characteristic facial phenotypes including a depressed nasal bridge and downslanting palperbral fissures. This complex and combinatorial phenotype presents a unique challenge in disambiguating the contributions of the genes within the deletion locus that may contribute to the ASD-like features of the CNV.

In order to study the molecular characteristics of the 17q12 deletion syndrome, we have developed a novel transgenic mouse model by deleting the syntenic genomic region, 11qC. Here, we demonstrate the generation of the 17q12 deletion syndrome mouse model and present our initial phenotypic characterizations of the model. We have validated the successful deletion of the 1.2Mb region through both sequencing and array comparative genomic hybridization screens and propagated the mutation through several generations. Through this propagation, we have observed a range of craniofacial abnormalities among a subset of offspring carrying the deletion, including shortening of the nose, bilateral asymmetry of the face, and most frequently, hydrocephaly. Further, we have observed brain abnormalities as early as postnatal day 0, including cortical thinning and enlargement of the ventricles. Our initial results support that we have established a novel mouse model of the 17q12 deletion syndrome that recapitulates important aspects of the human disorder. Use of this mouse model will greatly facilitate future molecular studies of 17q12 deletion syndrome, which is an under-explored CNV, and the polygenic contributions of the genes in the deleted region to an ASD-like phenotype.

AMERICAN CULTURAL CONNECTION ASSOCIATED WITH HIGHER RISK OF SUICIDE, DEPRESSION, AND ANXIETY IN JUSTICE INVOLVED YOUTH

Margaret Webb, BA, BS, PBacc, Kara Fox, Kathleen Kemp

Adolescent suicide is a serious public health concern in the United States. For youth involved in the juvenile justice system, suicide risk is magnified. Understanding relevant stressors is critical in developing and implementing effective suicide interventions. As part of a NIMH funded study (K23-MH111606) a sample of juvenile-justice involved adolescents (n=111) were assessed three months following their first court appointment.

Method. Youth completed self-report demographics and the Self-Injurious Thoughts and Behavior Interview (SITBI-JR) interview-style as well as RedCAP self-report measures, including the MAYSI-2 and the Bicultural Involvement Questionnaire (BIQ).

Demographics. Participating youth (n=111) screened as suicidal or depressed/anxious on the Massachusetts Youth Screening Instrument 2 (MAYSI-2) during their first court appointment. Thirty-six percent of the sample was male. The average age was 15.16 (SD=1.27). Youth self-identified as 41.4% Hispanic, 38.7% White, 22.5% Black, 9.9% American Indian, and 10.8% Other.

Bivariate Analyses. Independent samples t-tests were utilized to compare the self-reported cultural involvement ratings of youth who endorsed previous suicidal ideations and behaviors or flagged on the depression/anxiety (D/A) scale of the MAYSI-2 versus those who did not. Analyses were completed among the total sample (n=111) as well as Hispanic (n= 46) and Non-Hispanic Youth (n=65).

Suicide and Connection to American Culture. Youth who endorsed having previously made a suicide plan showed a significantly stronger preference for American culture versus youth who had not [M(SD) Plan=88.90(12.52), No-Plan=78.71(12.99); t(109)=-3.259, p=0.001]. This trend is also evidenced when comparing youth who endorsed previous suicidal thoughts, though not significantly so [M(SD) Thoughts=82.50(13.89), No-Thoughts=78.02(12.51); t(109)=-1.740, p=0.085]. There were no significant differences in culture preference across youth who had or had not previously made a suicide attempt.

Hispanic Youth Only. Youth who endorsed having suicidal thoughts on the SITBI showed a significantly higher preference for American culture than youth who did not [M(SD) Thoughts=81.48(7.51), No-Thoughts=75.52(10.24); t(44)=-2.211, p=0.032]. Base sizes were insufficient to assess differences in cultural preference between participants endorsing having a plan versus not.

Non-Hispanic Youth Only. Youth who endorsed having made a suicide plan on the SITBI showed a significantly higher preference for American culture than youth who did not [M(SD) Plan=90.72(12.20), No-Plan=79.13(15.56); t(63)=-2.840, p=0.006]. Differences in cultural preference were not significant when comparing youth on presence of suicidal thoughts.

Depression and Connection to American Culture. Youth who flagged on the D/A scale of the MAYSI-2 in the "Warning" or "Caution" range showed a significantly higher preference for American culture than youth who did not [M(SD) Flag=83.61(12.72), No-Flags=76.91(14.50); t(97)=-2.382, p=0.019]. Results persisted when comparing youth who flagged in the "Warning" range to those who did not flag. Analysis of Non-Hispanic Youth Only yielded significant results when comparing "Warning" range to non-flags [M(SD) Flag=89.18(13.52), No-Flags=77.46(16.21); t(39)=-2.438, p=0.019]. Similarly, the trend persists among Hispanic Youth Only, though not significantly [M(SD) Flag= 81.04(8.22), No-flags=75.73(10.38); t(35)=-1.660, p=0.106].

Discussion. Results suggest that cultural associations are an important consideration when combatting adolescent suicide and depression. Given the association between preference for American culture and suicidal thoughts and behaviors as well as depression persists across racial and ethnic groups, understanding this effect is critical for developing and implementing broadly effective interventions.

HOW DO MBIs IMPROVE DEPRESSION? A COMPARISON OF VALENCE-BIAS, SELF-BIAS AND VALENCE X SELF INTERACTION

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Objective: Although mindfulness-based interventions (MBIs) are often used to treat affective disorders, the mechanisms through which they produce clinical outcomes are not fully understood. Decreased self-bias following MBIs has received considerable attention as a possible mechanism (Ryan and Rigby 2015; Dahl, Lutz, and Davidson 2015; Hadash et al. 2016). Equally important in the onset, maintenance and recurrence of depression is valence-bias, which has received far less attention. To address this gap in knowledge, the current study examined if MBIs alter both valence and self-bias independently and in interaction with one another. This study also examined if change in bias predicted decreased depressive symptoms.

Participants and Methods: Data was collected from a sample of clinically depressed adults (N = 104) following a randomized 8-week MBI intervention that included weekly classes and daily independent formal meditation practice. Participants completed self-report measures of depression (IDS-C, Rush et al., 1996) and the self-reference task (SRT; Esslen, 2008) at study entry, post-intervention and 3-month follow-up. Main hypotheses were tested via t tests and hierarchical regression analyses.

Results: Unexpectedly, valence and self-bias were not associated with higher depression at baseline; however, treatment responders (i.e., those with a 50% or more reduction in depression) showed significantly higher negativity-bias at baseline as well as a significant reduction in negativity bias from pre to post-intervention. Additionally, improvement in depressive symptoms was associated with a decrease in negativity-bias and an increase of self-positivity-bias at 3-month follow-up. There was no association between a reduction in self-bias and improvement in depression.

Conclusion: The current study examined alterations in valence and self-biases as mechanisms underlying the relationship between MBIs and improved symptoms of depression. Findings highlight the important role of valence, particularly negative-bias and self-positive bias in reducing depression via MBIs. Findings also challenge existing evidence for MBIs' effects on self-related processes, namely self-bias. Study limitations, clinical implications and future directions will be discussed.

SENESCENCE OF PRIMARY HUMAN ASTROCYTES IN CELL CULTURE

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Aging is the greatest risk factor for neurodegenerative disease. A hallmark of aging is cellular senescence, which is characterized by a permanent exit from the cell cycle as well as major phenotypic changes, such as the pro-inflammatory senescence-associated secretory phenotype (SASP). Senescent cells have been shown to accumulate in most tissues, including the brain. Senescence of astrocytes, the most abundant glial cells in the brain, has been linked to some of the most important neurodegenerative diseases, such Alzheimer's, Parkinson's, and ALS (Bhat et al., 2012; Chinta et al., 2018; Das and Svendsen, 2015). Most research with astrocytes has used models of senescence induced in vitro by DNA damage or oxidative stress. However, little is known about senescence in astrocytes induced through replicative exhaustion, which is believed to be the major form of senescence that occurs in tissues with aging. We ask if replicative senescence can be induced in human astrocytes and what the mechanism is by which senescence is induced. To investigate replicative senescence in this cell type, we propagated cultures of primary human astrocytes (ScienCell, Inc.), sub-culturing 1:4 at near-confluence, repeating until growth arrest, and assaying cells for canonical identifiers of senescence. We did this under normoxic (atmospheric oxygen, 20%) conditions, as well as, for the first time, under physiological oxygen levels (3%). Methodology for investigating markers of senescence included: EdU incorporation to test for proliferation, SAB-gal staining, RT-qPCR analysis, immunofluorescent microscopy, and next-generation RNA sequencing. Astrocytes showed limited number of divisions in culture; late passage astrocytes showed significant decrease in proliferation by EdU incorporation assay. Late passage astrocytes tested positive for SAB-gal activity, DNA damage, and DNA repair markers. Cyclin-dependent kinase inhibitors and SASP factors were differentially expressed in late passage cells from normoxic but not physiological oxygen conditions. Pathway analysis of RNA-seq data showed both age and oxygen condition-dependent expression changes. Late passage human astrocytes show several common markers associated with cellular senescence. However, the lack of differential expression of certain markers in the late passage cells grown in low oxygen suggests a potential non-canonical pathway of senescence, which would be a novel discovery. Taken together, these data suggest that human astrocytes in culture undergo senescence. Further work is being conducted to determine the mechanism by which senescence is induced in this condition.

NHE6-MEDIATED GENE EXPRESSION CHANGES IDENTIFY LYSOSOME DYSFUNCTION AND NEURODEVELOPMENTAL PATHWAYS IN CHRISTIANSON SYNDROME CELL MODEL

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Christianson syndrome (CS) is an X-linked disorder resulting from loss-of-function mutations in X-linked SLC9A6 which encodes the endosomal Na+/H+ exchanger 6 (NHE6). Patients present with early developmental delay, seizures, intellectual disability, nonverbal status, autistic features, postnatal microcephaly, and progressive ataxia. In order to investigate neurodevelopmental mechanisms behind CS, we conducted in depth RNA-sequencing (RNA-seq) analysis on a novel CS cell model. In this model, the NHE6 gene was disrupted by CRIPSR/Cas9-mediated genome editing in near haploid human cell lines and paired with isogenic, parental controls. NHE6 mutant cell lines were confirmed to have endosome over-acidification as seen in other NHE6 null cells. RNA-seq analysis was performed by two widely-used pipelines: HISAT2-StringTie-DEseq2 and STAR-HTseq-DEseq2 using UCSC hg38 as human reference genome. Significantly differentially expressed genes (DEGs) (p.adj < 0.01, log2FC >1) were identified and have high level of concordance across pipelines. Subset of DEGs were experimentally confirmed by NanoString technology, a probe-based gene expression detection methodology. A full replication experiment was conducted on the same samples to augment the rigor of our study.

We identified over 1056 DEGs in concordance across the two pipelines and two experiments. DEGs common in both pipelines were further analyzed in The Database for Annotation, Visualization and Integrated Discovery (DAVID) and Ingenuity Pathway Analysis (IPA) to identify gene sets and pathways affected by mutant NHE6. We specifically found that neural development pathways were significantly enriched. Weighted Gene Co-Expression Network Analysis (WGCNA) was used to seek co-expression patterns on a system level. Two experiment sample datasets were combined together for the network analysis. 11 different expression pattern modules were observed. Modules highly enriched with DEGs showed significance association with wild-type/mutant status and SLC9A6 gene expression profile, and a high relevance to lysosome and lysosome membrane. These analyses suggest that dysregulation in lysosomes as a result of NHE6 dysfunction may be a mechanism behind CS.

FAMILY STRESS MODERATES EMOTIONAL AND BEHAVIORAL SYMPTOMS FOR CHILDREN IN A PARTIAL HOSPITAL SETTING

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Objective: Partial hospitalization programs are an increasingly utilized, multidisciplinary treatment for children with social, emotional, and behavioral needs. Although previous work suggests these programs improve children's mental health functioning, outcomes research has been limited. This study examines moderators of emotional and behavioral outcomes in children with serious mental illness, with particular focus on demographic (age, race, insurance type, and gender) and family (stressors and supports) factors. Method: The study includes 287 children ages 7-13. Children completed standardized questionnaires at admission and discharge including the Behavior Assessment System for Children-2 the Child Depression Inventory 2, and the Screen for Child Anxiety Related Disorders while caregivers completed the Strengths and Difficulties Questionnaire. Results: Results indicate improvements in children's anxiety, depressive symptoms, psychological adjustment, and emotional symptoms over the course of treatment. Furthermore, children with private insurance reported significant decreases in depressive ($F(1,171)= 27.15$, $p < .001$) and emotional symptoms ($F(1, 154)= 39.15$, $p < .001$) compared to children with state funded insurance. Females reported sharper decreases in depressive symptoms ($F(1,103)= 25.04$, $p<.001$) compared to males ($F(1, 179)= 5.56$, $p=.019$). Finally, children in families with no stressors in the past month demonstrated sharper declines in depressive symptoms compared to children in families with one or more stressors in the past month. Family support did not moderate these outcomes. Conclusions: Partial hospitalization programs may be effective in treating emotional and behavioral problems over the course of treatment. Furthermore, this study suggests family stressors is an important factor to consider and emphasize in treatment.

TRANSCRANIAL MAGNETIC STIMULATION IN MAJOR DEPRESSIVE DISORDER: EEG THETA CORDANCE CHANGE AND TREATMENT RESPONSE

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Background: Cordance is an electroencephalogram (EEG) metric correlated with brain perfusion underlying the electrode. Although baseline theta (4-8Hz) cordance has not been shown to predict response to repetitive transcranial magnetic stimulation (rTMS), treatment-emergent fronto-midline theta cordance changes (1-2 weeks into a course) have been consistently reported to correspond with outcomes in treatment of Major Depressive Disorder (MDD). It is unknown whether this treatment-emergent change persists throughout the remainder of the rTMS course and continues to associate with outcome. We examined cordance changes over time associated with a course of TMS, with the assumption that treatment-emergent changes such as those previously reported would still be evident at the end of the course of therapy. We hypothesized the previously reported results would be replicated in our sample.

Methods: Data from MDD patients who received rTMS treatment at Butler Hospital (N=80) or Providence VA Medical Center (N=15) were analyzed. Resting-state EEG was collected before the first and after final rTMS session. Treatment was delivered as a series of daily sessions (10-Hz or 5-Hz) over 4-6 weeks, to left DLPFC. Theta (4-8 Hz) cordance values were calculated based on absolute and relative power (within 0.5-20Hz) per Cook et al (1999), for each individual electrode and for 4 regions of interest (ROIs) in an 8-channel montage (FP1, FP2, FPz, F3, Fz, Cz, Pz, Oz), at pre- and post-treatment. The 4 ROIs were: prefrontal (PFC; defined by FP1, Fpz, and FP2); midline-right frontal (MRFC; defined by FPz, Fz, and FP2); midline-left frontal (MLFC; defined by FPz, Fz, FP1, and F3); and midline-central (CC; defined by Fz, Cz, and Pz). Clinical outcomes were %change on depression scales (Inventory of Depressive Symptomatology-Self Report [IDS-SR] and Patient Health Questionnaire-9 [PHQ-9]), as well as categorical response (≥50% score change) and remission (IDS-SR score≤14 or PHQ-9≤4). We investigated the relationships between theta cordance metrics and clinical variables (1) at baseline, and (2) as change from pre-to-post treatment timepoints.

Results: Usable EEG data were analyzed for n=95 at baseline and n=55 for both timepoints. Patients received 33.2±7.4 sessions over 6-7 weeks. None of the baseline theta cordance values in the 4 ROIs nor the overall fronto-midline cordance state predicted rTMS treatment response. Change in pre-to-post treatment theta cordance values (increased for MLFC and decreased for CC) were associated with PHQ-9 categorical response (p=.03 and p=.06, respectively). Cordance changes were not associated with the other outcome measures.

Conclusions: Consistent with other published reports, we found baseline theta cordance metrics were not useful for predicting subsequent rTMS treatment outcomes. This is the first study investigating fronto-midline cordance change from a baseline-to-endpoint perspective. Our data suggest treatment-emergent midline-left frontal cordance increases and central cordance decreases that persist at endpoint correspond with better outcomes. Our CC finding represents a replication of Hunter et al (2017), and our MLFC result is consistent with the finding of Ozekes et al (2014), wherein left frontal cordance increases predicted better response to TMS. The findings with endpoint EEG measures generally replicate those reported for treatment-emergent EEG cordance changes after 5 or 10 sessions, lending some support to the interpretation of cordance changes as relevant to TMS therapeutic mechanism of action for MDD.

PREFRONTAL CORTEX DYNAMICS DURING SEQUENTIAL TASKS USING AWAKE BEHAVING NONHUMAN PRIMATE fMRI

Nadira Yusif Rodriguez, BA, Theresa M. Desrochers

Tasks like giving a presentation can be considered abstract or non-motor sequences that demand internal monitoring (keeping track of slides), to complete a final goal (complete presentation). Despite the pervasiveness of abstract sequential tasks, little is known about their cognitive and neural mechanisms. Recent work showed that increasing ("ramping") activation in the rostrolateral prefrontal cortex (RLPFC) is necessary for abstract sequential tracking in humans (Desrochers, et al., 2015; Desrochers, et al., 2019). It is unknown if similar dynamics and brain areas govern sequence monitoring in monkeys. We tested this question using functional magnetic resonance imaging (fMRI) in monkeys as they fixated while passively viewing sequential visual stimuli. Monkeys were habituated to sequences of stimuli, then exposed to deviations from the established sequence either in number or in pattern (based on Wang, et al. 2015). Preliminary data show responses to sequence deviants in the prefrontal cortex (PFC) and an associated network of areas similar to previous studies performed with auditory stimuli. Further, we observed ramping activation in the PFC much like previous findings in humans. These results suggest similarities in PFC dynamics between monkeys and humans during sequence monitoring, enabling future cross-species comparisons.

MAPPING PTSD SYMPTOMS TO BRAIN NETWORKS: A MACHINE LEARNING STUDY

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Posttraumatic Stress Disorder (PTSD) is a prevalent and debilitating condition with complex and variable presentation. While PTSD symptom domains (intrusion, avoidance, cognition/mood and arousal/reactivity) correlate highly, the relative importance of these symptom subsets often differs across patients. In this study, we used machine learning to identify how PTSD symptom subsets differ based on brain functional connectivity. We acquired resting-state magnetic resonance imaging in a sample (N=50) of PTSD patients and characterized clinical features using the PTSD Checklist for DSM-5 (PCL-5). We compared connectivity among 100 cortical and subcortical regions within the default mode, salience, executive, and affective networks. We then used principal component analysis, least absolute shrinkage and selection operator regression, and wrapper feature selection to identify relationships between symptom domain severity and brain networks. We found connectivity predicted PTSD symptom profiles. Goodness of fit (R^2) for intrusion, avoidance, cognition/mood, and arousal/reactivity symptoms, was 0.45, 0.35, 0.33, and 0.37, for each domain respectively. All results were robust to leave-one-out cross-validation. While this work requires replication across larger populations, these findings demonstrate that this computation approach can directly link PTSD symptom domains with neural network connectivity patterns. This line of research provides an important step towards data-driven diagnostic assessments in PTSD, and the use of computational methods to identify individual patterns of network pathology that can be leveraged towards individualized treatment.