DEPARTMENT OF PSYCHIATRY **ANNUAL RESEARCH DAY**
JUNE 9, 2022 · 8:30AM to 4:00PM
Oakland Campus

Morning Poster Session – Soldiers & Sailors' Hall
Afternoon Presentations – University Club

Pitt Psychiatry Annual Research Day
June 9, 2022

Start	End	Session
8:30 AM	11:30 AM	**Poster Session** - *Soldiers & Sailors Hall*
11:30 AM	*11:50 PM*	***Break*** *– Travel to University Club for Lunch & Afternoon Sessions*
11:50 PM	12:45 PM	**Lunchtime** *– Roundtable Participants & General Registrants*
12:45 PM	*1:00 PM*	***Break*** *- Transition to Ballroom B*
1:00 PM	1:05 PM	**Welcome & Introduction** **David A. Lewis, MD -** *Distinguished Professor of Psychiatry and Neuroscience, Thomas Detre Professor of Academic Psychiatry, Chair, Department of Psychiatry*
1:05 PM	1:50 PM	**The Thrill of Victory and the Agony of Defeat: Perspectives on Building a Successful Research Program Despite Inevitable Obstacles** • **David A. Brent, MD** *– Distinguished Professor of Psychiatry, Pediatrics, Epidemiology, and Clinical and Translational Science and Endowed Chair in Suicide Studies* • **Erika E. Forbes, PhD** *- Professor of Psychiatry, Pediatrics, Psychology and Clinical and Translational Science* • **Carla A. Mazefsky, PhD** *- Professor of Psychiatry and Psychology*
1:50 PM	2:15 PM	**Speed Dat(a)ing Part I** • **Kristen Eckstrand, MD, PhD** *– Assistant Professor of Psychiatry* • **Karen Jakubowski, PhD** *- Assistant Professor of Psychiatry* • **Max Joffe, PhD** *- Assistant Professor of Psychiatry*
2:15 PM	*2:35 PM*	**Break**
2:35 PM	3:00 PM	**Speed Dat(a)ing Part II** • **Elizabeth McGuier, PhD** *- Assistant Professor of Psychiatry* • **Tae Woo "Ted" Park, MD** *- Assistant Professor of Psychiatry* • **Rui Peixoto, PhD** *- Assistant Professor of Psychiatry*
3:00 PM	3:45 PM	**Becoming Your Scientific Parents: Developing from Mentor/Mentee to Partners in Science** • **Daniel J. Buysse, MD** *- UPMC Endowed Chair in Sleep Medicine and Professor of Psychiatry and Clinical and Translational Science* **Martica H. Hall, PhD -** *Professor of Psychiatry, Psychology, and Clinical and Translational Science* • **William E. Klunk, MD, PhD** *- Distinguished Professor of Psychiatry and Neurology and Levidow-Pittsburgh Foundation Chair in Alzheimer's Disease and Dementia Disorders* **Annie Cohen, PhD**, *Associate Professor of Psychiatry* • **Robert A. Sweet, MD** *- UPMC Endowed Professor in Psychiatric Neuroscience and Professor of Neurology and Clinical and Translational Science* **Matthew L MacDonald, PhD** *- Associate Professor of Psychiatry*
3:45 PM		**Special Recognitions & Awards Ceremony**

POSTER LISTING

#	Abstract Title	Presenter	Location
1	Continuous Theta Burst Stimulation of the Ventromedial Prefrontal Cortex Potentiates Placebo-Induced Antidepressant Expectancies: A Pilot Study	Mia Achitoov, BS	First Floor Exhibit Hall
2	Sleep Deprivation Engages the Hypocretin/Orexin System to Regulate Reward Seeking	Ana Almeida Rojo, BS	First Floor Exhibit Hall
3	Dimensions of Interpersonal Support associated with Post-traumatic Stress in Older Adults	Helene Altmann, MD	First Floor Exhibit Hall
4	Executive functioning difficulties are associated with emotion dysregulation in autistic adolescents and adults	Ligia Antezana, MS	First Floor Exhibit Hall
5	Protecting Black women's psychological wellbeing following adolescent sexual trauma	Uma Balaji, BS, BA	First Floor Exhibit Hall
6	The role of precuneus lactate metabolism in bipolar disorder: Preliminary 7T MRSI data	Michele Bertocci, PhD	First Floor Exhibit Hall
7	Relationship between plasma clozapine/N-desmethylclozapine and changes in basal forebrain-dorsolateral prefrontal cortex coupling in treatment-resistant schizophrenia	Annie Blazer, MS	First Floor Exhibit Hall
8	Young pregnant women's concerns about prenatal marijuana use and the Office of Children, Youth, and Families (CYF) involvement	Nicole Boss, MA	First Floor Exhibit Hall
9	*WITHDRAWN* - Sex differences and diurnal variation in parvalbumin interneuron electrophysiological properties in mouse prefrontal cortex	Jennifer Burns, BS	First Floor Exhibit Hall
10	Negative Self-Concept Links Neural Self-referential Processing of Negative Self-Evaluations and Depressive Symptoms in Adolescent Girls	Rosalind Butterfield, PhD	First Floor Exhibit Hall
11	The relation of body image concerns to perinatal weight gain, stress & depression in women with pre-pregnancy overweight/obesity	Christine Call, PhD	First Floor Exhibit Hall
12	Traumatic experiences and hormone concentrations among midlife women	Mary Carson, MS	First Floor Exhibit Hall
13	Identification of putative signatures of neural activity within white matter and cerebrospinal fluid using ICA	Henry Chase, PhD	First Floor Exhibit Hall
14	Reducing MRI Inter-Scanner Variability Using 3D Superpixel ComBat	Chang-Le Chen, MSc	First Floor Exhibit Hall
15	Cell-type specific cannabinoid CB1 receptor alterations in patients with schizophrenia	Shinnyi Chou, MD, PhD	First Floor Exhibit Hall
16	Synaptic Variability and Cortical Gamma Oscillation Power in Schizophrenia	Daniel Chung, MD PhD	First Floor Exhibit Hall
17	Altered Rbfox1 signaling pathway and cortical parvalbumin neuron dysfunction in schizophrenia	Youjin Chung, MD	First Floor Exhibit Hall

#	Abstract Title	Presenter	Location
18	Exogenous and endogenous modulation of the default mode network: evidence from simultaneous EEG-fMRI-tACS and neuromelanin-MRI studies	Kevin Clancy, MS	First Floor Exhibit Hall
19	Role of Ventral Striatal Response to Reward Anticipation in Socially Anxious Adolescents	Kaetlyn Conner, BS	First Floor Exhibit Hall
20	Staff Perceptions of a Housing First Harm Reduction Housing Program for the Chronically Homeless	Jennifer Curran, DNP, BA, BSN	First Floor Exhibit Hall
21	*WITHDRAWN* - Executive Auditory Attention Circuitopathy in First-Episode Psychosis	Mark Curtis, PhD	First Floor Exhibit Hall
22	Development of Novel Therapies Against Viral Infections of the CNS	Leonardo D'Aiuto, PhD	First Floor Exhibit Hall
23	A PROMISing new measure for quantifying emotion dysregulation in toddlers and preschoolers: Development and Psychometrics of the Emotion Dysregulation Inventory – Young Child	Taylor Day, PhD	First Floor Exhibit Hall
24	Schizophrenia-associated MAP2 phosphorylation affects interactions with microtubules and actin	Rebecca DeGiosio, BS	First Floor Exhibit Hall
25	Prevention of Clozapine Induced Constipation	Dante Delerme, PharmD	First Floor Exhibit Hall
26	The Nature of Prefrontal Cortical Somatostatin and Parvalbumin Transcript Alterations in Schizophrenia: Markedly Lower Gene Expression without Missing Neurons	Samuel Dienel, BS	First Floor Exhibit Hall
27	Neuroticism and Cognitive Regulation of Anxiety in the Elderly	Alec James DiVito, MD	First Floor Exhibit Hall
28	Measuring Treatment Fidelity & Engagement in Online Mindfulness-Based Stress Reduction	Graham Dore, BS	First Floor Exhibit Hall
29	Differences in Transcript Isoform Usage and Alternative Splicing Across Layer III Pyramidal Neurons in the Visuospatial Working Memory Network	Kevin Dowling, BA	First Floor Exhibit Hall
30	Contributions of age related changes in Intracortical Myelination to Gamma Band Activity During Working Memory	Samuel Elliott, BS	First Floor Exhibit Hall
31	Multi-scanner Harmonization of Paired Neuroimaging Data via Structure Preserving Embedding Learning	Mahbaneh Eshaghzadeh Torbati, MS	First Floor Exhibit Hall
32	The Association Between Acne, Self-Esteem, and Depressive Symptoms in Adolescent Girls	Maria Evankovich, BS	First Floor Exhibit Hall
33	Combination of Antidepressants and Antipsychotics as Novel Treatment Options for Psychosis in Alzheimer's Disease	Peihao Fan, MS	First Floor Exhibit Hall
34	Pharmacist Impact on Treatment Retention for Medications for Alcohol Use Disorder and Opioid Use Disorder	Harrison Ferro, PharmD	First Floor Exhibit Hall

#	Abstract Title	Presenter	Location
35	A systematic review and meta-analysis of infant and toddler temperament as predictors of childhood attention-deficit/hyperactivity disorder	Nadiyah Fisher	First Floor Exhibit Hall
36	The role of parental acceptance in the association between sexual orientation and borderline personality features in adolescence	Mia Francisco, BS	First Floor Exhibit Hall
37	Internalizing and Externalizing Problems Among At-Risk Preschoolers: The Mediating Role of Maternal Invalidation	Olivia Frigoletto, BS	First Floor Exhibit Hall
38	Prenatal stress is associated with reduced infant working memory	Graciela Garcia Brizuela, BS	First Floor Exhibit Hall
39	Independent patterns of abnormal LOFC activity during reversal learning and perseverative grooming in a mouse model of compulsive behaviors.	Matthew Geramita, MD, PhD	First Floor Exhibit Hall
40	Early response to antidepressant treatment in late-life depression	Andrew Gerlach, PhD	First Floor Exhibit Hall
41	Effect of Continuous Theta Burst Stimulation on Cortical and Subcortical Reward Circuitry	Merage Ghane, PhD	First Floor Exhibit Hall
42	Protein Phosphorylation is Robustly Dysregulated in The Primary Auditory Cortex of Schizophrenia.	Jordan Gilardi, BS	First Floor Exhibit Hall
43	Anticholinergic drug burden and risk of incident MCI and dementia - A Population-Based Study	Ariel Gildengers, MD	First Floor Exhibit Hall
44	Considerations for a universal tau PET reference region	Alexandra Gogola, MS	First Floor Exhibit Hall
45	Change in marijuana use from adolescence to young adulthood and its relation to gestational alcohol and marijuana exposure	Lidush Goldschmidt, PhD	First Floor Exhibit Hall
46	Mechanisms of heterogeneity in transdiagnostic anhedonia in adolescents	Tina Gupta, MA	First Floor Exhibit Hall
47	Stress and Discrimination as Predictors of Alcohol and Cannabis Use during COVID-19	Maria Guzman, BA	First Floor Exhibit Hall
48	Neural reactivity to parental praise: Links to real-world functioning	Kiera James, PhD	First Floor Exhibit Hall
49	Minority Stress and Mental Health among Diverse Gender Minority Youth	EJ Jardas, BS	First Floor Exhibit Hall
50	Higher corticostriatal fractional anisotropy at 9-10 years predicts urgency at 11-12 years: Preliminary evidence	Meilin Jia-Richards, PhD	First Floor Exhibit Hall
51	Associations among sleep, diet, and gestational weight gain in a sample of pregnant individuals with overweight and obesity	Riley Jouppi, BA	First Floor Exhibit Hall

#	Abstract Title	Presenter	Location
52	Efficacy of clonidine versus buprenorphine/naloxone for opioid withdrawal at a psychiatric hospital	Zoe Karavolis, PharmD	First Floor Exhibit Hall
53	Relationships Among Childhood Adversity, Central Visceral Brain Regions and Adulthood Cardiovascular Stress Reactivity in a Transdiagnostic Sample Enriched for Abuse	Nithya Kasibhatla, BS	First Floor Exhibit Hall
54	Methodology of a digital health intervention to stabilize the 24-hour rhythm of sleep, meals, and physical activity among older bereaved spouses: The WELL study	Joseph Kazan, MD	First Floor Exhibit Hall
55	Neural response to discrimination-based stress and its association with alcohol consumption patterns between minoritized and majority populations	Gargi Kelkar, MA	First Floor Exhibit Hall
56	Diurnal Alterations in Gene Expression Across Striatal Subregions in Psychosis	Kyle Ketchesin, PhD	First Floor Exhibit Hall
57	Disruptions in circadian rhythms and sleep during adolescence induces changes in impulsivity, cognitive function, and gene expression in reward-related brain regions	Sam-Moon Kim, PhD	First Floor Exhibit Hall
58	Number Two When Feeling Blue: Characterizing Microbiome Alterations in Late Life Depression	Antonija Kolobaric, ScB	First Floor Exhibit Hall
59	Associations of trait worry with amyloid burden in late life: a role for stressor-evoked brain networks	Thomas Kraynak, PhD	First Floor Exhibit Hall
60	Loss of large dendritic spines during normal aging is mediated by alterations in discrete protein networks within the precuneus	Josh Krivinko, MD	First Floor Exhibit Hall
61	Amyloid Burden and Maladaptive Behaviors in Adults with Down Syndrome	Lauren Kubic, BA	First Floor Exhibit Hall
62	Retired Night Shift Workers Exhibit Poorer Neurocognitive Function Compared to Retired Day Workers	H. Matthew Lehrer, PhD	First Floor Exhibit Hall
63	Investigating Working Memory Functional Connectivity in Active and Background Networks among Subjects with Familial High-Risk of Schizophrenia	Madison Lewis, BS	First Floor Exhibit Hall
64	The role of sleep on white matter abnormalities associated with post-concussive symptoms in adolescents.	João Paulo Lima Santos, MD	First Floor Exhibit Hall
65	Hierarchical Symptom Components in Early Psychosis	Julia Longenecker, PhD	First Floor Exhibit Hall
66	Subcortical contributions to auditory perceptual deficits in first episode psychosis as assessed by the Frequency-Following Response: Preliminary results from pilot data	Fran López Caballero, PhD	First Floor Exhibit Hall
67	Difficult Life Circumstances, Perceived Stress, and Coping Motives as Predictors of Cannabis Use	Kelly Louie, BS	First Floor Exhibit Hall
68	Associations between early pubertal timing and HPA dysregulation during pregnancy	Laura Machlin, MA	First Floor Exhibit Hall

#	Abstract Title	Presenter	Location
69	Developing a measure of adult functional outcomes in autism spectrum disorder: Conceptual model and item generation of the Adult Functioning Scale	Kristen T. MacKenzie, PhD	First Floor Exhibit Hall
70	Piloting Transcranial Direct Current Stimulation of Visual Cortex to Reduce Threat Sensitivity	Kristie Mak, BSc	First Floor Exhibit Hall
71	Associations between teamwork and implementation outcomes in multidisciplinary cross-sector teams implementing a mental health screening and referral protocol	Elizabeth McGuier, PhD	First Floor Exhibit Hall
72	Cortical Thickness and Subcortical Gray Matter Volume in substance use disorders	Kaylynn McKinney, BS	First Floor Gettysburg Room
73	Behavioral and neuroimaging evidence prodromal to major depressive disorder onset in a young adult without personal or family history of psychiatric disorder: Case Report	Rachel Miceli, MA	First Floor Gettysburg Room
74	Impaired Amygdala Reactivity to Social Cues predicts Self-reported Loneliness	Alyssa Neppach, BS	First Floor Gettysburg Room
75	Puberty-related maturation of adolescent fronto-striatal resting-state functional connectivity is implicated in the development of inhibitory control	Amar Ojha, BA	First Floor Gettysburg Room
76	Trends in Adult ADHD Diagnosis and Treatment in Patients with Opioid Use Disorder in the United States	Tae Woo Park, MD, MSc	First Floor Gettysburg Room
77	Variation in Striatal Dopamine-Related Neurophysiology Supports Age-Related Changes in Glutamate through Human Adolescence	Ashley Parr, PhD	First Floor Gettysburg Room
78	Comparison of Rhythms Across the Human and Mouse Striatum	Kaitlyn Petersen, BS	First Floor Gettysburg Room
79	Mu-opioid blockade blunts neural responses to pleasant contextual cues through decoupling of prefrontal and anterior insula connectivity.	Pranjali Rajalakshmi, BS	First Floor Gettysburg Room
80	Linguistic analysis of positive autobiographical memories recalled by individuals with major depressive disorder during real-time fMRI neurofeedback training	Emma Riley, BS	First Floor Gettysburg Room
81	De novo Onset Substance Use Disorder among High-Risk Teenagers and Young Adults: A Longitudinal Study	Andrés Román-Jarrín, MD	First Floor Gettysburg Room
82	Neurological commonalities and differences in emotional dysregulation across three clinical scales in young adults seeking help for distress	Renata Rozovsky, PhD	First Floor Gettysburg Room
83	The Synaptic Proteome of Autism Spectrum Disorder throughout Development	Shelby Ruiz, BS	First Floor Gettysburg Room
84	Effects of Decrease in ATP1A3 on the Synaptic Proteome	Ryan Salisbury, BS	First Floor Gettysburg Room
85	Young Pregnant Women's Perspectives on Decisions to Disclose Marijuana use to their Obstetric Providers	Samantha Saloom, BS	First Floor Gettysburg Room

#	Abstract Title	Presenter	Location
86	The ability to resolve cognitive and perceptual interference is affected by age and lifetime spectrum mood symptoms	Skye Satz, BS	First Floor Gettysburg Room
87	Altered Excitatory and Inhibitory Ionotropic Postsynaptic Receptor Subunit Expression in the Cortical Visuospatial Working Memory Network in Schizophrenia.	Kirsten Schoonover, PhD	First Floor Gettysburg Room
88	Trait Urgency Mediates Associations Between Neural Emotion-Processing Markers of Emotion-Triggered Impulsivity and Mania in Young Adults At-Risk for Bipolar Disorder	Maya Schumer, BSc	First Floor Gettysburg Room
89	Sex differences in vascular reactivity of APP/PS1 mouse model of Alzheimer's disease	Noah Schweitzer, BS	First Floor Gettysburg Room
90	Peer Support Partners within High Fidelity Wraparound in Pennsylvania	AnnaMaria Segreti BS	First Floor Gettysburg Room
91	Racial identity as a moderator of daily life discrimination experiences on mood and alcohol craving among Black adults	Andrew Seidman, PhD	First Floor Hall of Valor
92	Longitudinal associations between Antagonism, Interpersonal Problems and Childhood Maltreatment in Borderline Personality Disorder	Tanya Shah, BA	First Floor Hall of Valor
93	Genetic sex mediates stress susceptibility in adult mice	Micah Shelton, MA	First Floor Hall of Valor
94	The Hierarchical Structure and Predictive Validity of Antagonism in Borderline Personality Disorder	Shreya Sheth, BA, MA	First Floor Hall of Valor
95	Manual Segmentation of the Bed Nucleus of Stria Terminalis using Multimodal 7 Tesla Structural Magnetic Resonance Imaging	Brandon Sibbach, BS	First Floor Hall of Valor
96	Clinical Impact of Impaired Auditory Cortex Dynamic Range in First-Episode Psychosis	Alfredo Sklar, MD, PhD	First Floor Hall of Valor
97	Effects of chemogenetic manipulation of dopaminergic projections to amygdala on cocaine cue associative learning	Dana Smith, BA	First Floor Hall of Valor
98	Impact of delta-9-tetrahydrocannabinol on cortical activity during working memory task performance	Sierra Stringfield, PhD	First Floor Hall of Valor
99	Potential functional connectivity alterations in adolescents following concussion	Stephen Suss, MS	First Floor Hall of Valor
100	Characterization?of Agents Used?for?the Treatment of Behavioral and Psychological Symptoms of Dementia (BPSD)	Emily Thacker, PharmD, BS	First Floor Hall of Valor
101	*WITHDRAWN* - Maternal depression affects positive affect dynamics with children and children's social outcomes during middle childhood	Salome Vanwoerden, PhD	First Floor Hall of Valor
102	Effectiveness of an Online Digital Parenting Program on Improving Parent-Child Interactions for Families Experiencing Vulnerability	Madison Very	First Floor Hall of Valor

#	Abstract Title	Presenter	Location
103	Lower GAD67 mRNA Levels in Somatostatin and Calretinin Neurons in the Prefrontal Cortex of Schizophrenia	Kirsten Wade, BA, BS	First Floor Hall of Valor
104	Mobile Cognitive Testing in Older Adults at risk for Alzheimer's Disease	Andrea Weinstein, PhD	First Floor Hall of Valor
105	Neural substrates of approach-avoidance conflict and association with response to psychotherapy in youth with anxiety disorders	Cecilia Westbrook, MD, PhD	First Floor Hall of Valor
106	Sexuality-specific parental support impacts stress reactivity in an adult LGB sample.	Eleanor Williams, BA	First Floor Hall of Valor
107	Infant temperament as a predictor of early ADHD symptoms and parenting self-efficacy in toddlerhood	Michelle Wilson, BS	First Floor Hall of Valor
108	Racial Discrimination & Microaggressions Differently Associated with Alcohol and Cannabis Use and Motives	Tyia Wilson, PhD	First Floor Hall of Valor
109	Online Victimization among Sexual and Gender Minority Youth with and Without Communication Deficits: Examining Lived Experience and Considering Implications for Technology-based Intervention	Emma Win, BS	First Floor Hall of Valor
110	An automated cortical parcellation pipeline for infant MRI to explore infant brain-behavior patterns	Yicheng Zhang	First Floor Hall of Valor

DEPARTMENT OF PSYCHIATRY **ANNUAL RESEARCH DAY**

ABSTRACTS

Presenter:	Mia Achitoov, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Continuous theta burst stimulation of the ventromedial prefrontal cortex potentiates placebo-induced antidepressant expectancies: A pilot study**
Author(s):	*Achitoov M , Neppach A , Karim H , Price R , Dombrovski AY , Pecina M*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: The vmPFC, implicated in the tracking of subjective value, has been robustly involved in the formation of placebo analgesia and antidepressant placebo effects. Here, we used Theta Burst Stimulation (TBS) of opposite directions to demonstrate the causal contribution of the vmPFC in placebo-induced antidepressant expectancies.

Methods: 25 unmedicated MDD individuals (18-55 years) were assigned to receive three within-subject counterbalanced forms of TBS targeting the vmPFC—intermittent (iTBS) expected to potentiate the vmPFC, continuous TBS (cTBS) expected to de-potentiate the vmPFC, or sham TBS (sTBS), immediately before a scanning session during the Antidepressant Placebo fMRI Task, which features two putative components of the placebo effect: expectancies and reinforcement. We recorded trial-by-trial behavioral responses and related brain activity during this task to examine the effects of task conditions (expectancy and reinforcement) on expectancy and mood ratings. Only behavioral responses will be reported here.

Results: In linear mixed-effect models, we tested the causal contribution of TBS (intermittent, continuous, or placebo) on Expectancy and Mood ratings during the Antidepressant Placebo fMRI Task. We found a significant TBS*Expectancy condition interaction for the prediction of expectancy ratings, such that cTBS, compared to iTBS, was associated with higher expectancies in response to high antidepressant expectancy condition (Estimate=0.623, S.E.=0.178, p<0.001). We also found a significant TBS*Reinforcement condition interaction for the prediction of mood ratings, such that cTBS, compared to iTBS, was associated with lower mood ratings in response to the baseline reinforcement condition (Estimate=0.557, S.E.=0.214, p=0.009).

Conclusion: These preliminary data demonstrate that continuous TBS-induced blockade of vmPFC neural processing enhances antidepressant expectancies in response to expectancy cues while reducing mood ratings in response to reinforcement cues, pointing to a critical role of the vmPFC in the modulation of antidepressant placebo effects.

Presenter:	Ana Almeida Rojo, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Sleep deprivation engages the hypocretin/orexin system to regulate reward seeking**
Author(s):	*Almeida Rojo AL , Heim B , Cai L , Huang YH*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: In preclinical studies, sleep deprivation (SD) and chronic sleep restriction (CSR) alter reward processing in humans and reward seeking/responding in rodents. However, mechanisms in SD-modulated reward are not clearly understood. The hypocretin/orexin system presents a candidate mechanism in SD-modulation of reward. Orexin receptors consist of orexin 1 and orexin 2 receptors (OX1R and OX2R), which exhibit partly overlapping but distinct expression in the brain with certain sexual dimorphism. Functionally, both OXRs play a role in regulating sleep and wakefulness, promoting arousal, and regulating natural reward. Thus, we hypothesize that SD recruits the orexin system to modulate natural reward-seeking in a sex- and receptor subtype-dependent manner.

Methods: Male and female mice were trained to self-administer sucrose pellets. After obtaining a 3-4-day baseline, mice underwent SD for 6 hours (ZT0-6). Mice then received systemic administration of OX1R or OX2R antagonist prior to self-administration (SA) test. Changes in c-Fos expression in the reward circuit were quantified 90 min from entering the SA chamber.

Results: Following normal sleep, OX1R or OX2R signaling did not modulate sucrose SA in males or females. After SD in female mice, OX2R but not OX1R antagonism reduced sucrose SA whereas in males, OX2R antagonism had no effect and OX1R antagonism increased sucrose SA. c-Fos quantifications are ongoing. Preliminary results suggest SD-induced, OX2R-dependent changes in the nucleus accumbens (NAc) and paraventricular nucleus of the hypothalamus (PVN).

Conclusion: In female mice, SD preferentially engages OX2R signaling to increase sucrose reward seeking. This effect may be mediated by OX2Rs in the NAc and/or PVN. Conclusions in male mice are pending.

Presenter:	Helene Altmann, MD
Current Position:	Resident
Title:	**Dimensions of interpersonal support associated with post-traumatic stress in older adults**
Author(s):	*Altmann HM , Gebara MA , Stahl ST*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Older adults experience numerous changes in their social networks and social environment which may worsen pre-existing Post Traumatic Stress Disorder (PTSD) symptoms. For example, social isolation may inhibit completion of prior avoidance behaviors which in turn worsens PTSD. We evaluated which dimensions of interpersonal support were associated with post-traumatic stress in older adults.

Methods: This study used data collected from a randomized controlled trial for depression prevention in adults 50+ years of age who had subsyndromal depression. Two hundred forty-seven participants were randomized to a problem-solving therapy arm or an enhanced usual care arm. Interpersonal support variables were measured at baseline and included 4 dimensions: tangible support, belonging support, self-esteem support, and appraisal support. We used linear regression to examine associations of each of the interpersonal support dimensions with PTSD symptoms (using the post-traumatic stress disorder checklist (PCL) for DSM IV), while controlling for well-established correlates of PTSD including depression, anxiety, and poor sleep quality.

Results: Participants were, on average, 65.6 years of age (SD = 10.9 years) and had 14.5 years of education (SD = 2.7 years). Seventy percent of participants were female. The total sample was 62.3% White, 36.4% Black/African American, and 1.2% Asian. In our linear regression analyses, belongingness support was the only dimension of interpersonal support significantly associated with PCL (ß = -0.186, t = -3.523, p = 0.001). Our model explained a moderate among of variance in the PCL (R^2 = 0.56).

Conclusion: A strong sense of belongingness and connection to family and friends was associated with fewer PTSD symptoms in older adults with subsyndromal depression. Future research should determine whether belongingness is modifiable in older adults and whether doing so reduces PTSD symptoms.

Presenter:	Ligia Antezana, MS
Current Position:	Undergraduate or Graduate Student
Title:	**Executive functioning difficulties are associated with emotion dysregulation in autistic adolescents and adults**
Author(s):	*Antezana L[1] , Conner CM[1] , Peven JC[1] , Beck KB[2] , White SW[3] , Mazefsky CA[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Rehabilitation Science and Technology, University of Pittsburgh
	[3]Department of Psychology, University of Alabama

Introduction: Emotion dysregulation is the failure to appropriately and flexibly modulate emotions. Autistic people have high rates of emotion dysregulation (e.g., emotional outbursts, internalizing symptoms). Long-standing work has also demonstrated that autistic individuals often experience executive functioning (EF) difficulties, especially with cognitive flexibility and inhibition. Despite these paralleling difficulties, few studies have explicitly examined the role of EF on emotion dysregulation in autism. We predicted that poorer inhibition would predict emotion reactivity and cognitive inflexibility would predict dysphoric, depressive, and anxiety symptoms.

Methods: The sample included 77 autistic participants (12-21 years), who were interested in treatment for emotion dysregulation. Trained evaluators administered the sorting test and color-word interference test of the Delis–Kaplan Executive Function System (D-KEFS). The color-word interference test (n=77) assesses the ability to inhibit a dominant verbal response; total number of errors from were used as the independent variable for inhbition. The sorting test (n=44) assesses both verbal and nonverbal concept-formation and problem-solving skills; total number of repeated descriptions were used as the independent variable for cognitive inflexibility. Participants completed self- and parent-report measures: the Emotion Dysregulation Inventory (subscales of Reactivity and Dysphoria), PROMIS®-Anxiety, and PROMIS®-Depression. Hierarchical linear regressions were used to examine the role of EF on emotion dysregulation, while controlling for covariates of age, IQ, and autistic traits.

Results: Poorer inhibition was associated with parent-reported emotion reactivity, ß=.30, t=2.60, p=.01. Cognitive inflexibility was associated with self-reported depressive symptoms, ß=-.34, t=2.73, p<.01. Cognitive inflexibility was associated with self-reported anxiety symptoms, ß=-.40, t=2.77, p<.01. All associations were significant above and beyond covariates. No associations were found with dysphoria.

Conclusion: EF difficulties are linked to emotion dysregulation in autistic adolescents and adults. This is an important step in understanding potentially differential roles of EF on emotion dysregulation. Future work should examine these links longitudinally and in response to psychosocial interventions.

Presenter:	Uma Balaji, BS, BA
Current Position:	Staff
Title:	**Protecting Black women's psychological wellbeing following adolescent sexual trauma**
Author(s):	*Balaji U[1] , Tung I[2] , Norcott C[3] , Hipwell A[4]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychology, California State University Dominguez Hills
	[3]Department of Psychiatry & Behavioral Neuroscience, University of Chicago
	[4]Department of Psychology, University of Pittsburgh

Introduction: Adolescent sexual trauma is associated with mental health difficulties in adulthood and disproportionately impacts Black girls, who are exposed to both gendered and racialized violence. There is therefore a need for research on contextual resilience-promoting factors for Black adolescent girls who experience sexual trauma. In this study, we aim to replicate findings on the association between Black girls' experience of sexual assault in adolescence and psychological wellbeing in early adulthood and to provide new data on the moderating effects of girls' trust in their primary caregivers and belonging in their racial/ethnic community.

Methods: Participants included 1296 Black girls from the longitudinal Pittsburgh Girls Study. Sexual assault was assessed prospectively from ages 13-17 and retrospectively at age 17. During adolescence (ages 13-17), participants also reported on trust in their primary caregiver and ethnic identity and belonging; responses for these hypothesized buffering factors were averaged over the four years. In adulthood (age 22-26), participants responded to the Flourishing Scale and Satisfaction with Life Scale; these responses also were averaged over the ages of 22-26.

Results: Approximately 10% of girls (n=128) reported sexual assault during adolescence. Hierarchical linear regressions revealed that adolescent sexual assault predicted lower flourishing in adulthood (b=-0.094, p=.001). In step two, both closeness with primary caregiver and ethnic identity in adolescence predicted higher flourishing (b=0.125, p<.001; b=0.305, p<.001) and life satisfaction (b=0.191, p<.001; b=0.101, p<.001) in adulthood. Adolescent sexual assault still predicted lower flourishing (b=-0.070, p=0.011). Finally, analyses revealed no significant interactions between ethnic identity or trust in caregiver and psychological wellbeing.

Conclusion: For Black girls, positive relationships with primary caregivers and racial/ethnic communities predict psychological wellbeing in early adulthood. However, these associations did not appear to reduce the impact of sexual assault on later well-being. More research is needed on resilience-promoting factors for Black adolescents who experience intersecting racialized and gendered violence.

Presenter:	Michele Bertocci, PhD
Current Position:	Faculty
Title:	**The role of precuneus lactate metabolism in bipolar disorder: Preliminary 7T MRSI data**
Author(s):	*Bertocci, M[1] , Yushmanov V[1] , Moon CH[1] , Abdul-Waalee H[2] , Versace A[2] , Phillips ML[2] , Birmaher B[2] , Hetherington H[1] , Pan J[1]*
Affiliation(s):	*[1]Department of Radiology, University of Pittsburgh*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Abnormalities in mania-related and depression-related behavioral energy are principal features of bipolar disorder (BD) suggesting energy metabolism dysfunction may play a role in this devastating disease. Lactate is produced adaptively and is efficiently used by mitochondria and astrocytes, yet its role in neural function is unclear. Lactate was considered to be a byproduct of anaerobic metabolism; however recent work has shown that its therapeutic use by infusion in traumatic brain injury (TBI) is beneficial in humans and rodents, suggesting an important and poorly understood role in neural health and functioning. Precuneus is a metabolic hotspot, is related to both task-positive and task-negative activity, and dysfunction may be related to BD. We aim to aid in understanding BD-related behavioral energy through an examination of precuneus lactate availability.

Methods: 13 adults with pediatric onset BD (mean age =25.7(5.47) years) and 2 healthy adults (mean age =28.5 years) from the COBY study were recruited. Magnetic Resonance Spectroscopic Imaging(MRSI) was acquired on a 7-Tesla scanner using a 16-channel transceiver array, MP2RAGE imaging, and a fast homonuclear edited J-difference spectroscopic imaging sequence to detect the 1.3ppm lactate (Lac) both during an emotional face processing task (4X3 minutes 12 seconds) and during resting state (4X3 minutes 12 seconds). Lac is expressed as ratio to the creatine (Cre) resonance. We used one sample t-tests in SPSS.

Results: BD participants showed reduced precuneus Lac/Cre availability: mean=.052(.04), range:0.017-0.167, $t(10)$ =-3.02, p=.013, Cohen's d=-2.34 relative to healthy=0.162, range:0.115-0.209 during rest, and trend-level reduced task-related precuneus Lac/Cre availability: mean=.081(.06), range:0.012-0.174, $t(10)$=-1.89, p<.088, Cohen's d=-1.46 relative to healthy =.170, range:0.102-0.238.

Conclusion: Preliminary results suggest that lower lactate availability in key neural regions may differentiate BD from healthy. Findings suggest that lactate availability in key neural regions may represent a novel feature of bipolar disorder diagnosis relative to healthy.

Presenter:	Annie Blazer, MS
Title:	**Changes in Corticostriatal Connectivity and Striatal Tissue Iron Associated with Clozapine Efficacy in Treatment-Resistant Schizophrenia**
Authors:	Blazer, AR[1]; Chengappa, KNR[1]; Foran, W[1]; Carr, AC[1]; Kahn, CE[1]; Luna, B[1,2]; Sarpal, DK[1]
Affiliations:	[1]*Department of Psychiatry,* [2]*Department of Psychology, University of Pittsburgh, Pittsburgh, PA, USA*

Introduction: Though numerous studies demonstrate the superiority of clozapine (CLZ) for treatment of persistent psychotic symptoms that are characteristic of treatment-refractory schizophrenia (TRS), what remains unknown are the neural and molecular mechanisms underlying CLZ's efficacy. Recent work implicates increased corticostriatal functional connectivity as a marker of response to non-CLZ, dopamine (DA) D2-receptor blocking antipsychotic drugs. However, it is undetermined whether this connectivity finding also relates to CLZ's unique efficacy, or if response to CLZ is associated with changes in striatal DA functioning. In a cohort of 22 individuals with TRS, we examined response to CLZ in relation to the following: (1) change in corticostriatal functional connectivity; and (2) change in a magnetic resonance-based measure of striatal tissue iron (R2'), which demonstrates utility as a proxy measure for elements of DA functioning.

Methods: Participants underwent scanning while starting CLZ and after 12 weeks of CLZ treatment. We used both cortical and striatal regions of interest to examine changes in corticostriatal interactions and striatal R2' in relation to CLZ response (% reduction of psychotic symptoms).

Results: We first found that response to CLZ was associated with an increase in corticostriatal connectivity between the dorsal caudate and regions of the frontoparietal network ($P < 0.05$, corrected). Secondly, we observed no significant changes in striatal R2' across CLZ treatment.

Conclusion: Overall, these results indicate that changes in corticostriatal networks without gross shifts in striatal DA functioning underlies CLZ response. Our results provide novel mechanistic insight into response to CLZ treatment.

Presenter:	Nicole Boss, MA
Current Position:	Staff
Title:	**Young pregnant women's concerns about prenatal marijuana use and the Office of Children, Youth, and Families (CYF) involvement**
Author(s):	*Boss N[1] , Saloom S[2] , Chang JC[3] , Hossain F[1] , Richardson G[1] , De Genna N[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Medicine, University of Pittsburgh School of Medicine
	[3]Department of Obstetrics, Gynecology, and Reproductive Sciences, University of Pittsburgh Medical School

Introduction: Prenatal marijuana use is increasing, especially in younger women. This is concerning due to short-term (e.g., restricted fetal growth) and long-term effects on development. Many pregnant women do not disclose marijuana use to healthcare providers, and when it is discussed, providers are more likely to mention the legal ramifications of use at delivery rather than health risks for mother and child. This study aims to give voice to a marginalized group of young pregnant women to better understand their concerns around prenatal marijuana use and their prenatal care.

Methods: Pregnant women enrolled in YoungMoms, a mixed-methods prenatal cohort study of pregnant women ages 13-22, were recruited for in-depth, audio-recorded qualitative interviews about prenatal marijuana and tobacco use. Content analysis of transcripts was conducted and coding regarding CYF were reviewed to identify common themes in the interviews.

Results: To date, 13 interviews have been completed: M age = 20 years (range = 17-21), 77% Black, 8% white, 15% Biracial; 38% prenatal marijuana use. A common theme centers on fears of CYF involvement during pregnancy, with many participants expressing a belief that it was an inevitable consequence of disclosure/discovery of prenatal marijuana use. Participants differed on their beliefs that CYF involvement was justified for prenatal marijuana use, voiced concerns about losing custody of their children, and described how these concerns affected their discussions with obstetric providers.

Conclusion: These findings highlight that for younger women seeking prenatal care, fear of CYF involvement is intertwined with their perception of healthcare and has implications for patient-provider communication. Given the increase in prenatal marijuana use among younger women, more research exploring how such perceptions might affect perinatal health behavior and neonatal outcomes is needed. Research examining healthcare provider perspectives regarding mandated reporting and prenatal marijuana use may provide further clarity and improve clinical training.

Presenter:	Jennifer Burns, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Sex differences and diurnal variation in parvalbumin interneuron electrophysiological properties in mouse prefrontal cortex**
Author(s):	*Burns JN , Huang YH , McClung CA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Approximately twenty-four-hour rhythms in behavior and physiology are widely conserved across the species and can be observed at the cellular and molecular level as changes in gene expression and cellular function. Previous studies in the prefrontal cortex (PFC) have shown that parvalbumin (PV) interneurons, which play a key role in regulating the excitation/inhibition balance and have been implicated in cognitive function, display diurnal changes in both PV expression and perineuronal nets (PNN). Given that studies have also found changes in PV cell excitability linked to PNN presence and overall diurnal changes in the excitation/inhibition balance have been observed in other cortical regions, we investigated diurnal changes in PV cell excitability, membrane properties, and the excitatory drive to these cells.

Methods: Male and female adult G42 mice were sacrificed at ZT 5-6 or 17-18 (lights on ZT 0) and slices were prepared for electrophysiology. PV cells in the medial PFC were selected for recording. Excitatory drive was measured as spontaneous excitatory postsynaptic currents to PV cells in the presence of picrotoxin. To measure PV cell excitability and membrane properties, current pulses were injected intracellularly; responses were averaged across up to 3 repeats.

Results: We found that action potential amplitude in female mice showed a significant effect of phase, with amplitudes higher in the light phase. Moreover, female mice showed a trend toward reduced spike frequency adaptation in the dark phase. No significant effect of phase was observed in male mice or in other properties examined in female mice.

Conclusion: PV cells have been heavily implicated in psychiatric diseases and previous research in our lab has shown robust circadian reprogramming of the transcriptome in the PFC in schizophrenia. Therefore, through better understanding the normal diurnal changes in the physiology of these cells, we may gain insight into how these processes are disrupted in disease.

Presenter:	Rosalind Butterfield, PhD
Current Position:	Postdoc Scholar
Title:	**Negative self-concept links neural self-referential processing of negative self-evaluations and depressive symptoms in adolescent girls**
Author(s):	*Butterfield RD[1] , Sequeira SL[2] , Jones NP[1] , Ladouceur CD[1] , Silk JS[2]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychology, University of Pittsburgh

Introduction: Adolescence is a period when self-concept stabilizes and when risk for depression increases, particularly in girls. During early adolescence, self-concept becomes highly reliant on social comparison, which can lead to excessive self-focused attention, possibly contributing to risk for depression. Affective neuroscience studies point to a neural network implicated in processing self-related information, yet little is known about how its function is associated with subjective feelings of self-concept and risk for depression in adolescence. We examined to what extent neural functioning during negative, compared to positive, self-referential processing was associated with early-adolescent depressive symptoms at two timepoints through their subjective feelings of self-concept.

Methods: Thirty-nine girls (M_{years}=12.18, SD=.77) reported on perceptions of their social, physical and global self-concept during a fMRI task in which they rated whether they believed positive and negative personality trait words were true about them. Girls reported on depressive symptoms at the time of the scan and approximately 6-months later. Data were preprocessed and analyzed using SPM12. Whole brain analyses (p-uncorr<.001) were conducted using a Self-negative>Self-positive contrast. Average activation from significant clusters (p-FWE<.05) was extracted for indirect analyses in SPSS PROCESS.

Results: Greater activation to negative, compared to positive, traits was found in the left dorsal medial prefrontal cortex (dMPFC), dMPFC/supplementary motor area, ventral lateral prefrontal cortex, and the visual association area. Indirect effect analyses demonstrated that more negative adolescent-reported self-perceptions during the fMRI task explained the negative association between activation in the dMPFC during Self-negative relative to Self-positive, and concurrent depressive symptoms; greater activation in the visual association area to Self-Positive was linked to lower depressive symptoms concurrently and at 6-month follow-up through more positive self-perceptions.

Conclusion: Findings highlight how differential neural processing of negative versus positive self-relevant information in the dMPFC and visual association cortex map onto behavioral reports of self-concept to contribute to depression in early adolescence.

Presenter: Christine Call, PhD

Current Position: Postdoc Scholar

Title: **The relation of body image concerns to perinatal weight gain, stress & depression in women with pre-pregnancy overweight/obesity**

Author(s): *Call CC[1] , Roberts SR[2] , Emery Tavernier RL[3] , Kolko Conlon RP[1] , Levine MD[4]*

Affiliation(s): *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

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[4]Departments of Psychiatry and Psychology, University of Pittsburgh

Introduction: Body image concerns during pregnancy are associated with excess gestational weight gain (GWG), stress, and depressive symptoms. No research has assessed these relationships among women with pre-pregnancy overweight/obesity, who are at heightened risk for these outcomes. This study examined the relation of weight and shape concerns in early pregnancy to weight gain, stress, and depressive symptoms at end-of-pregnancy and 6-months postpartum.

Methods: Pregnant women (N=257) with pre-pregnancy overweight/obesity participated in a longitudinal study of eating behaviors, weight, and wellbeing. Weight and shape concerns were assessed by the Eating Disorder Examination-Pregnancy Version between 12-20 weeks gestation ("early pregnancy;" M=15.70±2.43 weeks). Weight at delivery and 6-months postpartum were measured; self-reported pre-pregnancy weight was subtracted from each to calculate GWG and postpartum weight retention. Depressive symptoms were assessed with the Center for Epidemiological Studies-Depression Scale and perceived stress with the Perceived Stress Scale in early pregnancy, late pregnancy, and at 6-months postpartum. Separate regression models were used to estimate the relation of weight and shape concerns in early pregnancy to late pregnancy and postpartum outcomes, controlling for baseline levels of each outcome.

Results: Early pregnancy weight concern (B=3.39, SE=.1.30, p=.01) and shape concern (B=3.66, SE=1.23, p=.003) each predicted higher GWG and early pregnancy shape concern also predicted 6-month postpartum weight retention (B=3.45, SE=1.21, p=.005). Early pregnancy weight concern was marginally predictive of late pregnancy depressive symptoms (B=.09, SE=.04, p=.05). Neither shape nor weight concern predicted stress in late pregnancy or postpartum.

Conclusion: Weight and shape concerns in early pregnancy predicted greater GWG among women with pre-pregnancy overweight/obesity. Shape concern also predicted weight retention at 6-months postpartum. Relationships between weight and shape concerns and psychological outcomes were weak or non-existent. Addressing body image concerns may be a promising avenue for pregnant people at high risk for excess GWG and its adverse health consequences.

Presenter: Mary Carson, MS

Current Position: Undergraduate or Graduate Student

Title: **Traumatic experiences and hormone concentrations among midlife women**

Author(s):   *Carson MY[1], Maki PM[2], Thurston RC[3]*

Affiliation(s):   *[1]Department of Psychology, University of Pittsburgh*

[2]Department of Psychiatry, Department of Psychology, and Department Obstetrics & Gynecology, University of Illinois at Chicago

[3]Department of Psychiatry, University of Pittsburgh School of Medicine, Department of Epidemiology, and Department of Psychology, University of Pittsburgh

Introduction: Traumatic experiences are associated with poor health later in life. However, the relation of traumatic experiences to midlife women's physical health, particularly sex hormones, is not well understood. Loss of endogenous estrogen is associated with worse cardiovascular, bone, and mental health. Severe psychological stress may suppress ovarian function which reduces ovarian estrogen secretion. Early data link trauma to lower estradiol, but this study was conducted among younger women whose levels of estradiol are in the high, premenopausal range. Midlife is a time of rapid loss of ovarian estrogens and accumulating health risk. Further, little research has been conducted on estrone, the estrogen that becomes predominant in the postmenopause. We tested whether traumatic experiences are associated with lower endogenous estrogen (estradiol, estrone) in midlife women.

Methods: Participants (n=260; 79% white, 17% black, 4% other ethnicity; Mean age=59 years) were postmenopausal women free of hormone therapy. Women completed questionnaires (Brief Trauma Questionnaire, Center for Epidemiological Studies Depression, PTSD Checklist-Civilian Version, demographics) and a blood draw. Estradiol and estrone were assessed via liquid chromatography-mass spectrometry. Associations between lifetime traumatic events in relation to estrogens were tested via linear regression [covariates age, race/ethnicity, body mass index, smoking (ever)]. Depressive or post-traumatic stress symptoms were added in separate steps.

Results: Of the 260 women, 165 women (64%) reported a lifetime traumatic event. Women with a trauma history had lower levels of estrone [b(SE)=-.14 (.06), p=.01; multivariable, Figure 1] and lower levels of estradiol [b(SE)=-.16 (.08), p=.04; multivariable, Figure 2] than women without this history. Findings were not accounted for by depressive or post-traumatic stress symptoms.

Conclusion: Among these midlife women, lifetime trauma history was associated with lower concentrations of estrone and estradiol. This work underscores the importance of considering trauma in relation to endogenous estrogens, which have implications for women's midlife health. Supported by RF1AG053504, R01HL105647, K24HL123565, UL1TR000005.

Presenter: Henry Chase, PhD

Current Position: Faculty

Title: Identification of putative signatures of neural activity within white matter and cerebrospinal fluid using ICA

Author(s): *Chase HW , Ghane-Ezabadi M , Brady T , Skeba A , Hafeman DM , Phillips ML*

Affiliation(s): *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: In many branches of functional MRI research, particular resting fMRI, physiological and motion artifacts are often estimated from white matter (WM), cerebrospinal fluid (CSF) as well as global signal (GS). These estimates are used eliminate artifact via nuisance regression. However, while these sources may be enriched for sources of artifact, there is growing evidence that they may also contain neurally-generated signals. Here, we present a novel two-stage pipeline using temporal independent components analysis (ICA) to differentiate sources components derived from WM/CSF which may or may not resemble neural activity.

Methods: Following preprocessing, fMRI timeseries are identified within a WM/CSF mask, as well as voxels with the highest (top 2%) standard deviations, which are typically contaminated with physiological noise. Fast ICA is then run on the voxels within this mask, and the resulting components are evaluated for kurtosis/spikes. Spikes are isolated and eliminated from entire fMRI images via regression, and then ICA is rerun within the WM/CSF mask. Statistical properties of the resulting timeseries (e.g. hurst exponent, low frequency activity, spikes, correlation with motion) are compared with timeseries from grey matter regions. The pipeline was evaluated within a small test sample of multiband fMRI data from 35 individuals.

Results: At the first stage, a mean of 14.91 spike regressors were isolated from the derived components. At the second ICA stage (post-despiking), components with a strong predominance of low frequency activity (fractional amplitude of low frequency fluctuation: fALFF>3) were observed in around a quarter of the components (mean=4.6 out of 20).

Conclusion: The proposed method demonstrates the potential of ICA to differentiate spikes and high frequency signals from timeseries with properties characteristic of neural activation, from WM/CSF signals. Nevertheless, some artifacts (vascular/respiratory) can show power at low frequencies, and further evaluation of such components is required.

Presenter:	Chang-Le Chen, MSc
Current Position:	Undergraduate or Graduate Student
Title:	**Reducing MRI inter-scanner variability using 3D superpixel ComBat**
Author(s):	*Chen CL[1] , Eshaghzadeh TM[2] , Wilson JD[3] , Minhas D S[4] , Laymon CM[4] , Hwang SJ[5] , Aizenstein HJ[3] , Tudorascu DL[3]*
Affiliation(s):	*[1]Department of Bioengineering, Swanson School of Engineering*
	[2]Intelligent System Program, University of Pittsburgh School of Computing and Information
	[3]Department of Psychiatry, University of Pittsburgh School of Medicine
	[4]Department of Radiology, University of Pittsburgh School of Medicine
	[5]Department of Computer Science, University of Pittsburgh School of Computing and Information

Introduction: Aggregating structural MRI data across sites enables us to address the biological heterogeneity in neuropsychiatric brain disorders. However, inter-scanner variability hinders the direct comparability of multi-site/scanner MRI data. Although the ComBat method is commonly used to reduce the variability at the feature level (e.g., region-of-interest measures), directly harmonizing images at the voxel level using ComBat has been less investigated. To explore the feasibility of extending ComBat to the voxel level, we propose a framework that incorporates ComBat on three-dimensional superpixels, improving the computational efficiency and stability of harmonization.

Methods: Eighteen subjects (10 patients with Alzheimer's disease and 8 controls; overall age: 68.0 [9.3] years; 10 females) participated in this study. For each subject, T1-weighted images were acquired on each of four 3T scanners with different manufacturers or models. After the standard image preprocessing including two-step registration, the individuals' cross-scanner unharmonized scans (Raw images) were aligned to generate an average image for superpixel parcellation. The images were parcellated into ten thousands of superpixels based on local contrasts, and then ComBat was applied to each superpixel to harmonize voxel-wise signal distributions. The harmonized scans were used to estimate gray matter volume and cortical thickness by employing voxel- and surface-based morphometries, and the coefficients of variation of neuroanatomical measures were calculated to evaluate the harmonization performance.

Results: The harmonized images provided similar contrasts across scanners compared to the Raw images in visual inspection. The structural similarities between harmonized brain tissue maps were significantly improved across scanners ($p < 0.001$). Also, our0 method can significantly reduce the coefficients of variation in terms of volumetric and cortical thickness measures (both p-values < 0.001).

Conclusion: The proposed approach that optimizes the efficiency and performance of ComBat harmonization at the voxel level can significantly reduce the inter-scanner variation and improve the structural similarities between cross-scanner brain scans.

Presenter:	Shinnyi Chou, MD, PhD
Current Position:	Resident
Title:	**Cell-type specific cannabinoid CB1 receptor alterations in patients with schizophrenia**
Author(s):	*Chou, SC , Fish KN , Lewis DA , Sweet RA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Alterations in cannabinoid CB1 receptor are implicated in schizophrenia. However, previous CB1 studies showed discrepant results in the prefrontal cortex of schizophrenia. These studies utilized antibodies that preferentially target CB1 at inhibitory boutons, and the exclusion of CB1 measurement in excitatory boutons may underlie the discordant findings. CB1 participates in both depolarization-induced suppression of inhibition and excitation, and understanding cell-type specific CB1 alterations in schizophrenia may increase our insight into its influences on excitatory-inhibitory balance disruptions within the pathology. Here, we investigate CB1 distribution in both inhibitory and excitatory boutons in schizophrenia using quantitative fluorescent microscopy.

Methods: Postmortem tissues containing the prefrontal cortex from schizophrenia and nonpsychiatric comparisons were used. These subject pairs, matched for sex, age, and postmortem interval, were previously found to demonstrate reciprocal alterations between CB1 ligand binding and immunoreactivity study results. Sections were labeled with antibodies for CB1, vGlut1 (labeling intracortical excitatory boutons), and vGAT (labeling intracortical inhibitory boutons). Fluorescent intensities of CB1 within vGlut1- and vGAT-positive boutons were analyzed using quantitative fluorescence microscopy.

Results: CB1 co-expression with both vGlut1 and vGAT were visualized in boutons across all cortical layers. CB1 fluorescent intensity was lower in excitatory boutons compared to inhibitory boutons.

Conclusion: Previous studies examining CB1 alterations in postmortem cortex of subjects with schizophrenia utilized antibodies preferentially targeting CB1 at inhibitory boutons. Using a CB1 antibody that targets both excitatory and inhibitory boutons, we demonstrated distinct cell-type specific distributions of CB1 in the DLPFC of subjects with schizophrenia and nonpsychiatric comparisons. This suggests a possible mechanism by which CB1 dysregulation alters excitatory-inhibitory balance within schizophrenia. Expanding upon these findings, we plan to evaluate cell-type specific CB1 synaptic proteomics in schizophrenia as a potential contributor to the functional disturbances seen in this disorder.

Presenter:	Daniel Chung, MD, PhD
Current Position:	Resident
Title:	**Synaptic variability and cortical gamma oscillation power in schizophrenia**
Author(s):	*Chung DW , Geramita MA , Lewis DA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Cognitive impairments in schizophrenia are associated with lower gamma oscillation power in the prefrontal cortex (PFC). Gamma power depends in part on excitatory drive to fast-spiking parvalbumin interneurons (PVIs). Excitatory drive to cortical neurons varies in strength, which could affect how these neurons regulate network oscillations. The authors investigated whether variability in excitatory synaptic strength across PVIs could contribute to lower prefrontal gamma power in schizophrenia.

Methods: In postmortem PFC from 20 matched pairs of comparison and schizophrenia subjects, levels of vesicular glutamate transporter 1 (VGlut1) and postsynaptic density 95 (PSD95) proteins were quantified to assess variability in excitatory synaptic strength across PVIs. A computational model network was then used to simulate how variability in excitatory synaptic strength across fast-spiking (a defining feature of PVIs) interneurons (FSIs) regulates gamma power.

Results: The variability of VGlut1 and PSD95 levels at excitatory inputs across PVIs was larger in schizophrenia relative to comparison subjects. This alteration was not influenced by schizophrenia-associated comorbid factors, was not present in monkeys chronically exposed to antipsychotic medications, and was not present in calretinin interneurons. In the model network, variability in excitatory synaptic strength across FSIs regulated gamma power by affecting network synchrony. Finally, greater synaptic variability interacted synergistically with other synaptic alterations in schizophrenia (i.e., fewer excitatory inputs to FSIs and lower inhibitory strength from FSIs) to robustly reduce gamma power.

Conclusion: The study findings suggest that greater variability in excitatory synaptic strength across PVIs, in combination with other modest synaptic alterations in these neurons, can markedly lower PFC gamma power in schizophrenia.

Presenter:	Youjin Chung, MD
Current Position:	Resident
Title:	**Altered Rbfox1 signaling pathway and cortical parvalbumin neuron dysfunction in schizophrenia**
Author(s):	*Chung Y , Chung DW , Dienel SJ , Belch M , Fish KN , Lewis DA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Cognitive dysfunction in schizophrenia appears to be associated with lower inhibitory drive from parvalbumin-expressing (PV) interneurons in the prefrontal cortex (PFC). The cytoplasmic isoform of Rbfox1 participates in regulating inhibitory synaptic transmission from PV interneurons via interactions with its downstream target transcript, VAMP1. Here, we assess whether this relationship is altered in PV interneurons in schizophrenia.

Methods: Cytoplasmic Rbfox1 protein levels were quantified in PV interneurons in paraformaldehyde-fixed left PFC sections from 20 matched pairs of schizophrenia and comparison subject. Fresh-frozen right PFC sections from 10 of these subject pairs were used to quantify the levels of cytoplasmic Rbfox1 protein and VAMP1 mRNA in the cytoplasm of PV interneurons using combined fluorescent in situ hybridization and immunofluorescence.

Results: In the fixed left PFC, the mean cytoplasmic Rbfox1 protein level in PV interneurons was 26% lower (p=0.001) in schizophrenia relative to comparison subjects (n=20 pairs). Similarly, in the frozen right PFC, the mean cytoplasmic Rbfox1 protein level in PV interneurons was 14% lower (p<0.001) in schizophrenia (n=10 pairs). In the same 10 subject pairs, VAMP1 mRNA level was 20% lower (p=0.038) in schizophrenia. Cytoplasmic Rbfox1 protein and VAMP1 mRNA levels were positively correlated (r=0.513) across PV interneurons from all subjects.

Conclusion: Our findings show that lower cytoplasmic Rbfox1 protein expression in PV interneurons in schizophrenia predicts lower expression of its target transcript VAMP1. Given the role of the cytoplasmic Rbfox1-VAMP1 pathway in regulating inhibitory output strength from PV interneurons, the alterations in this pathway could contribute to cognitive dysfunction in schizophrenia.

Presenter:	Kevin Clancy, MS
Current Position:	Staff
Title:	**Exogenous and endogenous modulation of the default mode network: evidence from simultaneous EEG-fMRI-tACS and neuromelanin-MRI studies**
Author(s):	*Clancy K[2] , Li W[1] , Brown VM[2]*
Affiliation(s):	*[1]Department of Psychology, Florida State University*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: The default mode network (DMN) is the most prominent intrinsic connectivity network in humans. As such, dysregulated DMN activity is characteristic of major neuropsychiatric disorders. However, the field lacks mechanistic insights into the regulation of the DMN. The current study approached this problem by exogenously modulating neural synchrony, particularly alpha (8-12 Hz) oscillations, a dominant intrinsic oscillatory activity that has been increasingly associated with the DMN in both function and physiology. In an independent study, endogenous modulation of the DMN was evaluated through the imaging of the locus coeruleus-noradrenergic (LC-NA) system, a key endogenous neuromodulator known to impact alpha oscillations and large-scale neural network dynamics.

Methods: Simultaneous resting-state (rs) EEG-fMRI recordings were acquired before and after active (N = 18) or sham (N = 19) alpha-frequency transcranial alternating current stimulation (tACS) in healthy controls to acquire fMRI-based estimates of DMN connectivity and EEG-based estimates of sensor- and source-level alpha power and connectivity. In an independent transdiagnostic sample with and without anxiety (N = 16), neuromelanin-sensitive MRI was acquired, in addition to task-based fMRI, to isolate the LC and evaluate its connectivity with the DMN.

Results: rsEEG validated the effect of alpha-tACS, with the active group alone demonstrating post-stimulation increases in occipitoparietal alpha power and posterior-to-frontal alpha connectivity (p's < 0.031) . rsfMRI revealed post-stimulation increases in connectivity within the DMN (across PCC, mPFC, and right angular gyrus) i n the active group alone (p's < 0.011) , which was mediated by post-stimulation increases in posterior-to-frontal alpha connectivity (beta = 0.076, CI = [0.018 0.189]).

Conclusion: These findings provide preliminary evidence for a mechanistic link between alpha oscillations and DMN functioning. Specifically, exogenous modulation of alpha oscillations may serve as a means to upregulate DMN connectivity. Additional pilot data from neuromelanin-MRI will be presented to evaluate the endogenous modulation of the DMN through the LC-NA system.

Presenter: Kaetlyn Conner, BS

Current Position: Staff

Title:

Role of ventral striatal response to reward anticipation in socially anxious adolescents

Author(s): *Conner K, Forbes EE , Morgan JK*

Affiliation(s): *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Adolescence is a developmentally sensitive period characterized by social-affective changes, leaving adolescents susceptible to developing anxiety disorders. Notably, adolescents show remarkable changes in activity in the ventral striatum (VS), a neural region involved in reward. These normative changes in neural reward processing appear to be associated with the development of affective disorders, such as social anxiety disorder. Given the increased risk of developing social anxiety disorder in adolescence, especially for youth with a family history of affective disorders, a better understanding of the connection between neural reward response and anxiety symptoms during this time is necessary.

Methods: Participants were 33 adolescents (Mage=12.04 years, SD=1.04, Range=11-14 years, 42% female, 58% male). Adolescents completed the Self-Report of Childhood Anxiety Related Emotional Disorders (SCARED) and underwent an fMRI scan while completing a monetary Reward Guessing game. Maternal history of affective disorders was assessed via clinical interview.

Results: Across participants, there was significant activation in the bilateral VS (37 voxels, [12, 8,-6] t=4.17, pFWE=.026; 34 voxels,[-12, 6, -2], t=4.12, pFWE=.029) during reward anticipation. Findings from a regression model demonstrated an interactive effect of maternal history of affective disorders and adolescent VS activity on adolescent social anxiety symptoms on the SCARED (ß=-.64, t=-2.37, p=.025). Simple slope analyses indicated that family history of affective disorders was associated with higher social anxiety symptoms, only if adolescents had high levels of VS activity when anticipating reward (ß=.85, t=3.74, p=.001). In contrast, greater VS response during reward anticipation was associated with lower social anxiety symptoms for adolescents without a maternal history of psychiatric illness (ß=-.44, t=-2.18, p=.037).

Conclusion: A stronger reward response may act as a protective factor against social anxiety symptoms, only for adolescents without a family history of affective disorders. Findings suggest the need for differential targets of prevention of social anxiety disorder depending on family history of affective disorders.

Presenter:	Jennifer Curran, DNP, BA, BSN
Current Position:	Undergraduate or Graduate Student
Title:	**Staff perceptions of a Housing First Harm Reduction housing program for the chronically homeless**
Author(s):	*Curran JM*
Affiliation(s):	*Department of Nursing, Robert Morris University*

Introduction: Homelessness remains an unresolved worldwide issue with a negative impact on homeless individuals, caregivers, and society. Consequences include death and decreased quality of life for those experiencing homelessness, staff burnout, compassion fatigue and turnover. The Housing First Harm Reduction (HFHR) model is the evidence-based practice model that aims to resolve negative outcomes through a harm reduction approach for the chronically homeless. This model's low-barrier entry design may pose challenges to program residents and staff that may lead to staff burnout, turnover and compassion fatigue. This project explores staff perceptions of the HFHR housing model and what may lead to staff turnover, burnout and retention.

Methods: Design: Qualitative research, Grounded Theory design. Setting: An outpatient HFHR permanent supportive housing program. Recruitment: Purposive sampling of six program informants. Tool: One audio-recorded, semi-structured interview and demographic questionnaire. Each interview was manually transcribed verbatim. Readback and summarization were used within the interview after each informant's response to ensure credibility and trustworthiness. Analyses involved transcription coding for categories and subcategories leading to key ideas and common themes using an inductive coding framework until theoretical saturation was reached.

Results: Demographic data will not be disclosed to protect the privacy of the informants. Themes: Retention, self-reflection and safety. This project revealed that staff's caring and commitment to the program residents leads to staff retention. The residents' reciprocal caring for staff is a key factor in making staff feel safe. Staff have mixed feelings regarding the HFHR housing program. Mental strain, safety concerns, staffing shortages, overtime, low pay and no upward mobility were some reasons for staff burnout and turnover.

Conclusion: Results may lead to interventions for a safer program environment for staff and residents and may lead to decreased staff turnover by combating staff burnout, and compassion fatigue. Further staff education regarding the HFHR model and Motivational Interviewing is needed.

Presenter:	Mark Curtis, PhD
Current Position:	Postdoc Associate
Title:	**Executive auditory attention circuitopathy in first-episode psychosis**
Author(s):	*Curtis MT , Sklar A , Ren X , Fishel VY , Torrence N , Wang Y , Seebold D , Farris R , Coffman BA , Salisbury DF*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Selective attention deficits emerge by the first episode of psychosis (FEP), reflected in impaired modulation of EEG N100 and MEG M100 by attention. Attentional enhancement is related to local oscillatory phase-amplitude coupling (PAC) between incoming low-frequency phase and local high-frequency power. The incoming oscillation reflects long-range connectivity within an executive attention network. We investigated PAC and long-range spectral connectivity in healthy controls (HC) and FEP.

Methods: MEG was recorded from 27 FEP and 31 matched HC while alternately ignoring and attending tones. PAC was calculated in 3 bilateral HCP-defined auditory regions (A1, lateral belt, and parabelt). The low-frequency identified in AC showed strong functional connectivity to precuneus, an executive attention area used to identify functionally connected areas in all other HCP regions. Gray matter differences within networks were also examined.

Results: PAC increased with attention between theta phase (5-7 Hz) and gamma amplitude (35-40 Hz) in left A1 (FDR<0.05) in both HC and FEP. In HC, left precuneus had phase locking increases with attention with left frontal pole, temporo-parieto-occipital junction, and auditory medial belt. The right precuneus had significantly greater connectivity with attention with right prefrontal cortex and lateral occipital cortex. Importantly, FEP did not increase connectivity between regions with attention (p's<0.05). FEP had significantly thinner gray matter in the left hemisphere network (p<0.05).

Conclusion: Theta-gamma PAC increases with attention in A1, even in FEP. The attention network identified included precuneus, frontal, temporo-parieto-occipital junction, and auditory cortex. FEP showed deficits within this network as failure to increase inter-regional theta phase locking with attention and experienced gray matter deficits in the left hemisphere regions. These novel findings indicate attention-related circuitopathy early in psychosis amenable for future non-invasive interventions.

Presenter: Leonardo D'Aiuto, PhD

Current Position: Faculty

Title: **Development of novel therapies against viral infections of the CNS**

Author(s):   *D'Aiuto L[1] , McNulty J[2] , Caldwell JK[1] , Bloom DC[3] , Nimgaonkar V[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Chemistry and Chemical Biology, McMaster University

[3]Department of Molecular Genetics and Microbiology, University of Florida

Introduction: Neurotropic viral infections of the central nervous system (CNS) cause a broad spectrum of clinical manifestations, which include neuropathological changes and subsequent neurological conditions. Currently utilized antiviral drugs are targeted towards specific viruses or members of a specific family. However, the recent COVID-19 pandemic caused by the neurotropic virus SARS-CoV-2 has highlighted the importance of having broad spectrum agents available in our armamentarium that can limit replication of emerging COVID-19 variants and future unidentified pathogens that can pose a risk for the next global pandemic.

Methods: Using a human induced pluripotent stem cells (hiPSCs)-based platform, we have previously identified a lycorane-type alkaloid, termed "R430", which is able to inhibit the infection of DNA (HSV-1, HSV-2, HCMV, MCMV) and RNA (ZIKV strains FSS-13025 and PE-243) neurotropic viruses. However, higher toxicity when compared to acyclovir (the gold standard anti-herpetic drug) was observed in fibroblasts and hepatocytes.
Thus, we employed a structure-activity relationship study to generate R430 analogs which would possess a comparable antiviral activity but reduced cellular toxicity. Brain organoids generated from two human hiPSC lines (01SD and 9001) were utilized to investigate the antiviral activity and cell toxicity of R430 derivatives

Results: We identified an R430 analog, "R799", which exhibits antiviral activity against HSV-1 comparable to R430 but with lower toxicity levels. The drug concentration that reduced the percentage of infected cells by 50% (IC50) was estimated to be 499.8 nM in 9001 and 221.3 nM in 01SD. No cell toxicity was detected up to 50 ?M. Both compounds R430 and R799 exhibited potent activity to SARS-CoV-2. Mechanistic investigations reveal a significant effect on host-cell innate immunity.

Conclusion: R799 exhibits a remarkable inhibitory activity against HSV-1 and SARS-CoV-2. If confirmed, the broad-spectrum activity of this novel compound will provide a novel therapeutic intervention against viral infection of central nervous system.

Presenter: Taylor Day, PhD

Current Position: Postdoc Scholar

Title: **A PROMISing new measure for quantifying emotion dysregulation in toddlers and preschoolers: Development and psychometrics of the Emotion Dysregulation Inventory – young child**

Author(s): *Day T[1], Yu L[1] , Neece C[2] , Mazefsky CA[1]*

Affiliation(s): *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Psychology, Loma Linda University

Introduction: Emotion dysregulation (ED) is thought to mechanistically underlie the high rates of psychiatric comorbidity in autism spectrum disorder (ASD), with ED four times higher in ASD than non-ASD. The Emotion Dysregulation Inventory (EDI) was designed and validated as a highly efficient, sensitive outcome measure to characterize ED in youth ages 6+. This project presents the adaptation of EDI for use in children ages 2-5 (EDI-YC).

Methods: Following PROMIS? guidelines, the EDI-YC item bank included relevant items from the original EDI and new items. Expert review and cognitive interviews were conducted to refine the item content/wording and establish construct validity. The final 48 items were tested in 1,093 young children with ASD and non-ASD developmental delays (i.e., clinical sample) and 1,046 young children from the general population (i.e., general sample).

Results: A two-factor solution emerged as most meaningful. Following item response theory (IRT) analyses, the final item bank included 15 items on factor 1 and 7 items on factor 2. The factors were consistent with the original EDI: (F1) Reactivity, which captures rapidly escalating, intense, and poorly regulated negative affect; and (F2) Dysphoria, which reflects low positive affect and unease. Some items overlapped with the best-performing items for the original EDI (e.g., does not seem to enjoy anything) and others were newly added items conceptualized to be relevant for young children (e.g., becomes frustrated when needs are not immediately met). The short-form included 7 Reactivity items and 7 Dysphoria items. Norms were created for both the clinical and general samples.

Conclusion: An effective, highly efficient measure of ED was derived for ages 2-5, which could become an ideal screening tool for early identification. Based on the results, the ED construct is comparable in early and later childhood. The EDI-YC and EDI will be psychometrically linked to enable progress monitoring and longitudinal studies across childhood.

Presenter: Rebecca DeGiosio, BS

Current Position: Undergraduate or Graduate Student

Title: **Schizophrenia-associated MAP2 phosphorylation affects interactions with microtubules and actin**

Author(s): *DeGiosio RA[1] , Needham PG[2] , Andrews OA[3] , Grubisha MJ[1] , Brodsky JL[4] , Sweet RA[1]*

Affiliation(s): *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Biological Sciences, University of Pittsburgh
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[4]Department of Biological Sciences, University of Pittsburgh

Introduction: Microtubule-associated protein 2 (MAP2) is the predominant dendritic cytoskeletal regulator, influencing dendritic arbor and spine morphology, which are altered in schizophrenia (SZ). MAP2 is regulated by multiple mechanisms, most prominently phosphorylation (MAP2-P). We have previously demonstrated that MAP2-P state is altered in SZ, with multiple phosphopeptides being upregulated in disorder. Moreover, a subset of identified phosphopeptides (10 sites) were negatively correlated with dendritic spine density in primary auditory cortex, suggesting that SZ-associated MAP2-P has consequences for protein function, in turn compromising neuronal morphology/function. Here, we set out to characterize the consequences of SZ-associated MAP2-P events on protein function by assessing the 1) tubulin polymerization, 2) microtubule-binding, and 3) actin-binding abilities of purified phosphomimetic MAP2c constructs.

Methods: Phosphomimetic MAP2c mutants were expressed in Bl21(DE3) bacteria and purified by boiling. Ultracentrifugation-based microtubule- and actin-binding assays as well as a turbidometric tubulin polymerization assay were performed by manufacturer's instructions (Cytoskeleton Inc).

Results: Phosphomimicry at multiple residues in the proline-rich and C-terminal domains- including T293, T300, S426, S439 and S443- were sufficient to delay microtubule nucleation. S426 additionally slowed polymerization rate. T293, T300, S426 and S439 inhibited actin-binding, while only S426 and S439 inhibited microtubule-binding. Other tested sites, including T249, S252, Y253, S297 and S446, showed no effects.

Conclusion: These data indicate that SZ is characterized by both regulatory MAP2-P events and events which are irrelevant to its interactions with cytoskeletal filaments. We put forward MAP2-P-mediated changes to microtubule nucleation kinetics and microtubule/actin crosslinking as potential mechanisms for dendritic dysmorphogenesis in SZ. Future studies will examine effects of MAP2 phosphomimicry on microtubule dynamics and dendritic architecture in neuronal culture.

Presenter:	Dante Delerme, PharmD
Current Position:	Resident
Title:	**Prevention of clozapine induced constipation**
Author(s):	*Delerme D , Joseph M , Fielding K , Fabian T*
Affiliation(s):	*Department of Pharmacy, UPMC Western Psychiatric Hospital*

Introduction: Clozapine is the most efficacious agent for patients with schizophrenia due to its superiority in head-to-head clinical trials and its benefit in suicide prevention. Though extremely effective, its safety profile is undesirable. Clozapine induced constipation (CIC) affects up to 80% of users and can result in fecal impactions which can lead to vomiting, bowel necrosis, and death. This project is designed to evaluate the utilization of constipation prophylaxis agents and concomitant hypomotility agents for patients taking clozapine at an inpatient psychiatric hospital.

Methods: The electronic medical record was used to identify patient encounters admitted and discharged from January 1, 2020 through December 31, 2020 with active clozapine orders during their inpatient hospital stay. These encounters were evaluated for a bowel regimen order at any time during their hospitalization. If a bowel regimen was ordered, the time of initiation in relation to clozapine was assessed. The specific medications, number of administrations, and side effects were also evaluated.

Results: Out of 109 patient encounters, 68 (62.4%) were administered at least one medication for constipation. At any point during their hospitalization, 83 encounters (76.1%) were ordered a bowel regimen. 49.5% and 33.0% of encounters had a bowel regimen order before clozapine or at the same time as clozapine, respectively. There were 17.4% of encounters that had a bowel regimen ordered after clozapine initiation. Docusate was the most common medication ordered as a constipation prophylaxis agent (36.4%). The GI consult service was utilized for 1 (0.9%) encounter.

Conclusion: These findings suggest that there is still nearly a quarter (24%) of clozapine encounters that did not have a bowel regimen ordered during their hospitalization. When a bowel regimen was ordered, it was utilized in 82% of encounters. Most encounters were ordered scheduled constipation prophylaxis agents (70%), which has shown to me more efficacious in treating CIC.

Presenter:	Samuel Dienel, BS
Current Position:	Medical Student
Title:	**The nature of prefrontal cortical somatostatin and parvalbumin transcript alterations in schizophrenia: Markedly lower gene expression without missing neurons**
Author(s):	*Dienel S, Fish KN , Lewis DA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: In schizophrenia, somatostatin (SST) and parvalbumin (PV) mRNA levels are lower in the dorsolateral prefrontal cortex (DLPFC), with some studies reporting lower densities of SST and PV neurons. However, it remains unclear if the latter findings reflect fewer neurons or limitations in their detectability due to lower SST and PV mRNA levels.

Methods: To selectively identify all SST and PV neurons, we utilized multiplex fluorescent in situ hybridization to label cells that express both vesicular GABA transporter (VGAT), a marker of GABA neurons, and SOX6, a marker of both SST and PV neurons, as levels of these two transcripts are not altered in schizophrenia. In layers 2 and 4 of the DLPFC, where SST and PV neurons are differentially enriched, respectively, we quantified the relative densities of VGAT/SOX6, SST, and PV expressing neurons and the relative levels of SST and PV mRNAs per neuron.

Results: In subjects with schizophrenia, mRNA levels per neuron were markedly lower for SST in both layers (Cohen's d > 1.3; P < 0.0001) and for PV in layer 4 (Cohen's d = 0.8; P < 0.0001) relative to matched comparison subjects. In contrast, the relative densities of all VGAT/SOX6 neurons, SST-expressing, or PV-expressing neurons did not differ between subject groups.

Conclusion: Schizophrenia is associated with marked deficits in SST and PV mRNA levels without fewer neurons of either subtype. Our findings argue against abnormal neuronal death or migration as pathogenic mechanisms for GABA neuron alterations in schizophrenia and instead support circuit dysfunction as a cause of lower gene expression.

Presenter:	Alec James DiVito, MD
Current Position:	Postdoc Scholar
Title:	**Neuroticism and cognitive regulation of anxiety in the elderly**
Author(s):	*DiVito AJ , Karim HT , Tudorascu DL , Andreescu C*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Cognitive reappraisal is a component of learned emotion regulation to reduce anxiety. Neuroticism, as one of the Big Five personality traits, is conceptualized to be relatively stable across time and is also related to anxiety. In a secondary analysis, the effect of cognitive reappraisal on overall anxiety, rumination, and worry was examined with neuroticism as mediator and moderator to further understand the relationship among inherited and learned modulators of anxiety in a geriatric sample.

Methods: Data are from a functional neuroanatomy study of worry in older adults (n = 128). To assess the effect of neuroticism on the association between cognitive reappraisal and anxiety (HARS, RSQ, and PSWQ), a mediation analysis was performed. The significance of the indirect effect was tested using bootstrapping procedures. A moderation analysis was conducted by including a cognitive reappraisal and neuroticism interaction term.

Results: Greater cognitive reappraisal was associated with lower neuroticism. Greater cognitive reappraisal was associated with lower rumination, which was fully mediated by neuroticism. Greater cognitive reappraisal was associated with lower worry, which was fully mediated by neuroticism. Neuroticism and the cognitive reappraisal*neuroticism interaction term were significantly associated with overall anxiety.

Conclusion: An association between cognitive reappraisal and neuroticism was identified. Cross-sectional study design distinguish mediation from confounding, therefore the distinction was made conceptually. Given the general immutability of personality, the outcome of neuroticism as confounder is more likely. Neuroticism may "mask" the true effect of cognitive reappraisal on rumination and worry. Further investigation is necessary to determine if stratification would reveal a relationship between cognitive reappraisal and rumination or worry by level of neuroticism. The directionality of the moderation analysis implies that with greater neuroticism, the effect of cognitive reappraisal on reducing overall anxiety is greater. This adds evidence towards establishing neuroticism as the environment in which emotional regulation functions to modulate symptoms of anxiety.

Presenter:	Dore Graham, BS
Current Position:	Staff
Title:	**Measuring treatment fidelity & engagement in online mindfulness-based stress reduction**
Author(s):	*Graham D[1], Dore GA[1] , Lawrence SM[1] , Thieret J[2] , Greco CM[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
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Introduction: Measurement of treatment fidelity is an often-overlooked aspect of using Mindfulness-Based Stress Reduction (MBSR) in clinical trials. The challenge is to ensure that treatment is delivered in a way that is true to treatment protocol, consistent across trial sites, reduces burden on researchers. Described here is the development and implementation of a brief online MBSR fidelity measure currently used within the OPTIMUM study.

Methods: The fidelity & engagement metric was created using Qualtrics Survey Software and designed to be easily rated using devices with internet connection (cell phones, tablets, desktops, etc.). The survey is password protected with the link and password provided only to OPTIMUM staff at three sites, ensuring data security. The survey's four domains consist of – Session Logistics, Session Content Elements, Participant Engagement, and Technology Obstacles. Examples of items within each domain are: 1 - session date, staff initials, site/cohort; 2 - meditation practice, breakout sessions with clinician, home practice; 3 - Likert scales on extent of participant engagement; 4 – Likert scales on extent technology obstacles hindered participants' engagement.

Results: The measure has been implemented in 68 intervention sessions since development. Regarding the extent of participants' engagement in sessions, 59% of sessions were rated 'Very much', 33% rated 'Quite a bit', and 2% rated 'a little bit.' Technology issues hindered engagement from 'Very much' (3% of sessions) to 'Not at all' (33% of sessions).

Conclusion: The measure is an effective metric for assessing and recording intervention fidelity, measuring participant engagement, and logging technical difficulties of the intervention's online platform (HIPAA-Compliant ZOOM). It was easily shared between sites with a centralized platform allowing for effective tracking of entries across three OPTIMUM sites. The researchers have found it to be easy and convenient to use, generating several techniques for bolstering participant engagement: breakout rooms; resources for home practice; personalized praise.

Presenter:	Kevin Dowling, BA
Current Position:	Medical Student
Title:	**Differences in transcript isoform ssage and alternative splicing across layer III pyramidal neurons in the visuospatial working memory network**
Author(s):	*Dowling KF[1], Enwright JE[2], Arion D[2], Lewis DA[2]*
Affiliation(s):	*[1]Medical Scientist Training Program, University of Pittsburgh*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Human visuospatial working memory (VSWM) depends on a network of functionally distinct cortical regions, including primary visual (V1) and association cortices (dorsolateral prefrontal cortex, dlPFC; posterior parietal cortex, PPC). Across regions, layer 3 pyramidal neurons (L3PNs) differ in excitability and morphology, and in activity during VSWM tasks, partly due to regional differences in gene expression. Although alternative splicing (AS) of pre-mRNA is evident in nearly all genes and can alter neuron physiology, it is unclear if AS differs between L3PNs across regions of the VSWM network.

Methods: L3PN samples were collected from the dlPFC, PPC, and V1 of neurotypical individuals (n=40) by laser microdissection and underwent RNA-sequencing. LeafCutter and StringTie/IsoformSwitchAnalyzeR were used to analyze AS and a related measure, differential transcript usage (DTU), between regions.

Results: Most genes (50%-58.5%) with significant DTU were not differentially expressed, suggesting DTU captures a unique component of the L3PN VSWM transcriptome. Fewer transcripts demonstrated significant DTU between dlPFC and PPC (18 transcripts) than between dlPFC/PPC and V1 (3,896/4,217 transcripts), the latter of which were significantly enriched for 384 pathways (top pathways: mRNA processing, synaptic transmission). Transcripts in V1 were also enriched for non-coding potential, intron retention, and nonsense-mediated decay (NMD) sensitivity, particularly within mRNA regulatory pathways. Considerably more AS events differed between dlPFC/PPC and V1 (844/855 events) than between dlPFC and PPC (163 events), though differentially spliced genes in each contrast were enriched for pathways related to synaptic plasticity, actin regulation, and excitatory neurotransmission.

Conclusion: Exons demonstrating significant AS across all three regions have previously been shown to influence neuronal excitability and spine density. These AS events might therefore contribute to gradients in L3PN spine density and excitability from dlPFC to V1. Additionally, AS-mediated NMD regulates protein expression, including expression of mRNA transcriptional proteins. Paradoxically, AS may thus contribute to previously described L3PN regional gene expression differences.

Presenter: Samuel Elliott, BS

Current Position: Undergraduate or Graduate Student

Title: **Contributions of age related changes in intracortical myelination to gamma band activity during working memory**

Author(s): *Elliott S[1], McKeon S[2], Foran W[3], Calabro F[3], Luna B[3]*

Affiliation(s): *[1]Department of Psychology, University of Pittsburgh*

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[3]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: The neural mechanisms supporting developmental improvements in working memory into adulthood are not well understood. Oscillatory gamma band activity, which supports inter-laminar and inter-regional communication, is known to support working memory maintenance and shows age related improvements. Age-related increases in intracortical myelination speeds neural signal transmission and signal fidelity, critical for integrating information processing. However, little is known about how the development of intracortical myelination may support gamma function supporting working memory.

Methods: To test this, we acquired EEG during a memory guided saccade (MGS) task, as well as magnetization transfer MRI scans, a sensitive measure of myelination, at 7T in the same participants. After data quality exclusions, 119 participants were included (ages 10-30, 67 F). Intracortical magnetization transfer ratio (MTR) was calculated at 75% the depth from the pial surface to gray/white matter boundary. Gamma band spectral events (i.e., activity bursts) were calculated over 1 second epochs during the delay period of the MGS task.

Results: Whole brain MTR was positively correlated with whole brain gamma trial power (p=0.003) and variability (p = 0.011), after controlling for age and correcting for multiple comparisons. Follow up analyses tested whether regions that undergo significant age-related change in MTR are associated with whole brain gamma power and variability. After correcting for multiple comparisons, MTR in the anterior cingulate cortex (ACC) was significantly associated with trial power variability (p=0.004).

Conclusion: These findings indicate that intracortical myelin is associated with gamma power and trial-to-trial variability, where maturation of ACC performance monitoring processing may be playing a primary role, providing preliminary evidence supporting a role for the development of cortical myelination in the maturation of gamma band bursting activity.

Presenter:	Mahbaneh Eshaghzadeh Torbati, MS
Current Position:	Undergraduate or Graduate Student
Title:	**Multi-scanner harmonization of paired neuroimaging data via structure preserving embedding learning**
Author(s): *Affiliation(s):*	*Eshaghzadeh Torbati M[1] , Minhas DS[2] , Maillard P[3] , DeCarli CS[3] , Hwang SJ[4] , Tudorascu DL[5]*
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	[5]Department of Psychiatry,, University of Pittsburgh School of Medicine

Introduction: Modern neuroimaging studies frequently combine data collected from multiple scanners. However, these aggregated datasets may contain technical variability which can obfuscate the biological measures of clinical interest. Such variability is referred to as scanner effects, and the techniques of removing scanner effects are called harmonization methods. In this work, we present MISPEL (Multi-scanner Image harmonization via Structure Preserving Embedding Learning), a multi-scanner harmonization method.

Methods: MISPEL is a deep learning harmonization technique for paired data. In paired data, each participant is scanned on multiple scanners to generate a set of images (called paired images), which differ solely due to the scanner effects. In MISPEL, the images of each scanner have their own unit of harmonization. This unit consists of a U-Net encoder to extract the latent embeddings of input images, followed by a linear decoder to reconstruct harmonized images using the embeddings. In MISPEL, the encoder-decoder units are trained simultaneously to harmonize images by generating identical images across scanners.

MISPEL was applied to a paired dataset consisting of N = 18 participants, each with T1-weighted (T1-w) MR acquisitions on M = 4 different 3T scanners: General Electric (GE), Philips, Siemens Prisma, and Siemens Trio. The median age was 72 years (range 51-78 years), 44% were males, 44% were cognitively normal, and the remaining had diagnoses of Alzheimer's disease.

Results: Scanner effects were observed in our paired data using all three evaluation criteria. WS and RAVEL removed scanner effects to some extent, however they were outperformed by MISPEL.

Conclusion: MISPEL can be used for harmonizing aggregated data for which a paired dataset exists. MISPEL could be first trained on the paired dataset and then could be applied for harmonizing images acquired on scanners for which paired data exists.

Presenter:	Maria Evankovich, BS
Current Position:	Medical Student
Title:	**The association between acne, self-esteem, and depressive symptoms in adolescent girls**
Author(s):	*Evankovich MR[1] , Hutchinson E[2] , Scott LN[3] , Ladouceur CD[3] , Silk JS[2]*
Affiliation(s):	*[1] School of Medicine, University of Pittsburgh*
	[2] Department of Psychology, University of Pittsburgh
	[3] Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Rates of depression are higher among adolescent girls compared to boys. Physical appearance related concerns, such as acne, may contribute to gender differences in rates of depression during adolescence. Adolescent girls with acne report lower self-worth and body satisfaction than girls without acne, which may contribute to depressive symptoms. The present study investigated how acne-related concerns, self-esteem (global and physical appearance related), and their interaction contribute to depressive symptoms among adolescent girls. We hypothesized that acne-related concerns would moderate the association between self-esteem and depressive symptoms, such that girls with the greater acne-related concerns and lower self-esteem will report the greatest depressive symptoms.

Methods: Thirty-five adolescent girls (ages 13-15; M=15.16; 69% Caucasian) at-risk for anxiety and depression based on temperament were included from a larger longitudinal study. Self-reported questionnaire data from the third wave of the larger study was examined. The Dermatology Life Quality Index assessed acne-related concerns. The Mood and Feelings Questionnaire–Child Version. assessed depressive symptoms. The Harter's Self-Perception Profile for Adolescents assessed self-esteem (global and physical appearance).

Results: Acne-related concerns and global self-esteem did not significantly predict depressive symptoms (ps>.05). The interaction of global self-esteem and acne-related concerns did significantly predict depressive symptoms (ß=.448, t(2,37), p=.025), such that adolescent girls who reported greater acne-related concerns and lower global self-esteem also reported more depressive symptoms. However, the overall model was not significant (p>.05). Acne-related concerns, physical appearance self-esteem, and their interaction did not significantly predict depressive symptoms (ps > .05).

Conclusion: Acne-related concerns may be an important moderator of the association between global self-esteem and depressive symptoms among adolescent girls. More research is needed on how to address physical appearance related changes related to puberty in mental health treatment. It may be important to address addressing emotional issues in skin care treatment and vice versa.

Presenter: Peihao Fan, MS

Current Position: Undergraduate or Graduate Student

Title: **Combination of antidepressants and antipsychotics as novel treatment options for psychosis in Alzheimer's disease**

Author(s): *Fan P[1], Kofler J[2], Sweet R[3], Wang L[1]*

Affiliation(s): *[1]School of Pharmacy, University of Pittsburgh*

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[3]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: As one of the most common complications of AD, psychotic symptoms are reported in roughly half of all AD patients. However, the current recommended treatments, second-generation antipsychotics (SGAs), are shown to have only modest efficacy in AD+P. Both GWAS and early clinical trials promoted the potential beneficial effects of antidepressants against AD+P which provide rationale for exploring their potentials as combination therapy.

Methods: Latest postsynaptic density proteome expression data is used to construct a comprehensive protein-protein interaction (PPI) network to represent the characteristics of AD+P. The relationship between drugs and AD+P can be evaluated with network analysis methods based on the topological parameters measuring associations among sub-networks. A combined score is defined by combining the measurements on the separation between drugs and proximity between drugs and disease respectively. The higher of the score, the bigger chance that the two drugs may have synergistic effect against AD+P.

Results: We built a comprehensive PPI network containing 75 antipsychotics targets, 32 antidepressants target and 461 AD+P related proteins, with a total of 543 nodes in the PPI network. A total of 357 antidepressant-antipsychotic drug pairs are listed from 17 antidepressants and 22 antipsychotics that are commonly used in clinical settings. Most drug pairs showed a combined score around 0 which indicate that synergetic effect between antipsychotics and antidepressants may not be easily achieved within the two drug categories. However, some drugs showed promising results through the panel like Aripiprazole, Fluoxetine and Paroxetine. Seven drug combinations are nominated for potential synergetic effect.

Conclusion: The results of this study provide us a comprehensive and quantitative overview of the underlying relationship among antipsychotics, antidepressants and AD+P. Our results supported the current choice of antipsychotics and suggested the most promising antidepressants that can be added as supplementary treatment, Sertraline and Maprotiline.

Presenter:	Harrison Ferro, PharmD
Current Position:	Resident
Title:	Pharmacist impact on treatment retention for medications for alcohol use disorder and opioid use disorder
Author(s):	*Ferro HP*
Affiliation(s):	*Inpatient Pharmacy, UPMC Western Psychiatric Hospital*

Introduction: Treatment retention rates for opioid use disorder (OUD) and alcohol use disorder (AUD) remain low. Two major areas of engagement are that of treatment initiation and retention. Telehealth pharmacy services can improve retention rates for medications for AUD (MAUD) and OUD (MOUD). Exposure to a health provider may also assist in coordinating care after a patient leaves the hospital setting. The goal of this project is to assess if a pharmacist can improve treatment retention rates for MAUD and MOUD through a transitions of care service following discharge from a psychiatric hospital.

Methods: From October 19th, 2021, to April 1st, 2022, patients with a diagnosis of OUD or AUD were seen the dual diagnosis unit of Western Psychiatric Hospital by a pharmacist to discuss initiation of MOUD or MAUD. Patients could not be consistently taking MOUD or MAUD to be selected for treatment. Patients that accepted medications were then contacted via telephone once weekly for three weeks following discharge. During these calls, the pharmacist would ask about medication efficacy, side effects, barriers to care, and address any patient questions. If a patient did not answer after 3 calls, no further contact attempts were made. The primary outcome assessed 30-day fill dates for MOUD and MAUD with a secondary outcome of 30-day hospital readmission.

Results: Fifty-seven total patients were seen by a pharmacist regarding MAUD or MOUD initiation. Of those 57 patients, 40 accepted medications. Of those 40 patients, 37 were prescribed MAUD or MOUD at discharge. The 30-day treatment retention rate will be evaluated after May 1st, 2022, as the final patient was seen on April 1st, 2022. The comparison to the control group will also be assessed after May 1st, 2022.

Conclusion: The final conclusion of the study will be assessed once the results are finalized.

Presenter:	Nadiyah Fisher
Current Position:	Undergraduate or Graduate Student
Title:	**A systematic review and meta-analysis of infant and toddler temperament as predictors of childhood attention-deficit/hyperactivity disorder**
Author(s): *Affiliation(s):*	*Fisher N[3] , Lorenzo NE[1] , Novick DR[2] , Gibson C[3] , Rothenberger SD[4] , Foust JE[5] , Chronis-Tuscano A[2] , Joseph HM[3]*
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Introduction: Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder with onset as early as preschool and impairment across the lifespan. Temperament factors, specifically those that theoretically map onto ADHD symptoms, may be early markers of risk for developing later childhood ADHD that could be identifiable in infancy or toddlerhood. This meta-analysis examined the associations between these early temperamental factors and later symptoms and diagnosis of ADHD and mapped early temperament constructs onto the three ADHD symptom dimensions.

Methods: A systemic review of the literature was conducted to identify prospective longitudinal studies that included theoretically relevant temperament constructs (sustained attention, activity level, inhibitory control, and negative emotionality) examined from birth to 36 months old and ADHD (symptoms or diagnosis) in preschool or childhood. The association between each temperament construct and ADHD outcomes were examined using pooled standardized estimates in meta-analyses.

Results: Forty-eight articles (n=112,716 infants/toddlers) prospectively examined temperament and the relation to childhood ADHD symptoms or diagnosis. Activity level in infancy and toddlerhood was moderately associated with childhood ADHD (r = .39, p < .001). Small effect sizes were observed for sustained attention (r = -.28, p < .001) and negative emotionality (r = .25, p < .001) with ADHD. The specificity of each temperament construct for later ADHD symptom dimensions was such that activity level and negative emotionality were predictive of all three symptom dimensions whereas sustained attention was only associated with combined symptoms.

Conclusion: Infant and toddler temperament may be an early risk factor for the development of childhood ADHD that could be utilized for early intervention identification. Yet, this systematic review found that relatively few prospective longitudinal studies have examined sustained attention and inhibitory control in infancy and toddlerhood in relation to later ADHD highlighting the need for further research.

Presenter: Mia Francisco, BS

Current Position: Staff

Title: **The role of parental acceptance in the association between sexual orientation and borderline personality features in adolescence**

Author(s): *Francisco MG[1] , Williams EA[1] , Berona J[2] , Stepp SD[3] , Hipwell AE[3] , Keenan K[2]*

Affiliation(s): *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Psychiatry and Behavioral Neuroscience, University of Chicago

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Introduction: Sexual minority adults have higher rates of borderline personality disorder (BPD) than heterosexuals (Kerridge et al., 2017). Parental behavior in adolescence has been identified as a predictor of BPD symptomology (Stepp SD et al., 2017). Parental acceptance may be an important moderator of health for LGB girls. (Davis and Anderson, 2020) The aims of the present study were to test whether: (1) BPD symptomology and parental acceptance varies between heterosexual and sexual minority adolescent girls; and (2) parental acceptance moderates the relationship between sexual orientation (SO) and BPD symptomology.

Methods: Data for this study were drawn from the Pittsburgh Girls Study (PGS). At age 16, participants self-identified their SO: heterosexual (n=1916; 78.2%), bisexual (n= 113; 4.6%), and gay/lesbian (n=31; 1.5%) and completed the International Personality Disorder Examination BPD (IPDE-BOR) screening measure. Parental acceptance was assessed using the Children's Reports of Parent Behavior Inventory (CRPBI) 'Acceptance of Individuation' sub-scale.

Results: BPD symptomology differed significantly by SO ($F_{(2, 2057)} = 20.259$, p =<.001). Bisexual participants had significantly higher BPD scores than heterosexual participants (M = 3.840 (SD = .231) versus M=2.96 (SD=2.451), p <.001)). Participants with higher parental acceptance reported significantly lower BPD scores ($F_{(16, 2024)} = 3.591$, p =<.001). Bisexual girls reported lower levels of parental acceptance than heterosexuals (M= 17.04, (SD=4.241) versus M=18.01 (SD=3.751), p =.008). Both bisexuality and parental acceptance explained unique variance in BPD scores, but there was no significant interaction effect (p =.339).

Conclusion: While bisexual participants had higher BPD scores and reported lower parental acceptance at age 16, Parental acceptance did not attenuate the increased risk for BPD symptoms observed for bisexual girls. Future research on other aspects of parenting, including support of SO specifically, is needed to further explore the potential protective effects of family support on the mental health of sexual minority youth.

Presenter: Olivia Frigoletto, BS

Current Position: Staff

Title: **Internalizing and externalizing problems among at-risk preschoolers: The mediating role of maternal invalidation**

Author(s): *Frigoletto OA[1] , Byrd AL[1] , Vine V[2] , Vanwoerden S[1] , Zalweski M[3] , Stepp S[1]*

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Introduction: Internalizing and externalizing problems in preschoolers have been linked to development of serious psychopathology later in life. Children of parents who struggle with emotion regulation (ER) may be at heightened risk, and maternal invalidation may partly explain this association. However, previous research has not examined this developmental pathway among at-risk preschool children, despite implications for etiological and prevention models. The current study used a cross-informant design to test the indirect effect of clinician-rated maternal ER difficulties on teacher-reported internalizing and externalizing problems through maternal invalidation. This risk pathway was tested in two groups of preschoolers defined by maternal ER status: children of mothers with ER difficulties and children of mothers without ER difficulties (healthy controls).

Methods: Participants were 85 mothers (Mage =33.30 years, SD=4.78; 36% racial/ethnic minority) and their children (Mage =42.34 months; SD=3.68; 45% female; 47% racial/ethnic minority), including 44 mothers with ER difficulties and 41 mothers without ER difficulties. Mothers reported on maternal invalidation, and preschool teachers/daycare providers reported on child internalizing problems and externalizing problems (i.e., aggressive behavior, attention problems).

Results: Using the SPSS PROCESS macro, indirect effects were examined while controlling for the effects of child sex, child minority status, and family receipt of public assistance. Maternal ER status had a significant indirect effect on child internalizing (b=1.93, SE=0.91, 95% CI [0.57, 4.24]) and externalizing problems, specifically aggressive behavior (b=2.17, SE=1.28, 95% CI [0.01, 5.08]), through maternal invalidation. Specifically, mothers with ER difficulties reported more maternal invalidation and their children exhibited more internalizing problems and aggressive behavior at preschool/daycare.

Conclusion: Results are consistent with maternal invalidation as a mechanistic risk pathway explaining the association between mothers' ER difficulties and their children's internalizing problems and aggressive behaviors, pointing to multiple avenues for intervention and prevention.

Presenter:	Graciela Garcia Brizuela, BS
Current Position:	Staff
Title:	**Prenatal stress is associated with reduced infant working memory**
Author(s):	*Hipwell AE[1] , Garcia Brizuela G[1] , Ilyumzhinova R[2] , Tung I[1] , Northup J[1] , Keenan K[2]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
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Introduction: Prenatal stress alters offspring neurodevelopment leading to deficits such as impairments in cognitive function. Most studies have examined general cognitive capacity as an outcome, as opposed to more narrowly defined dimensions of neurodevelopment (e.g., working memory), which may increase the specificity of associations between neural systems impacted by prenatal stress.

Methods: We tested the hypothesis that prenatal stress would be associated with infant working memory after accounting for concurrent maternal stress. Infants (N=88, 47% female, age=7.14 months, SD=1.38) completed the Delayed Match Retrieval task (DMRT, Kaldy, Guillory & Blaser, 2016) to assess visual working memory using an eye-tracking platform. Mothers reported on negative life events, perceived stress, and discrimination during pregnancy and at the time of the infant visit. Average performance based on time to first fixation (TFF) on the location of the hidden match was greater than chance ($p<.001$). Hierarchical multiple regression models examined the impact of each type of maternal stress exposure on infant working memory after accounting for sex and age.

Results: Results revealed a significant negative effect of prenatal negative life events on TFF ($\beta = -.26$, $t = -2.05$, $p < .05$) that became negligible once concurrent negative life events were included in the model. Prenatal perceived stress had a significant negative effect on TFF ($\beta = -.29$, $t = -2.35$, $p < .05$), which remained significant when concurrent perceived stress was also accounted for ($\beta = -.29$, $t = -2.07$, $p < .05$). Maternal reports of discrimination stress during pregnancy and in the postpartum period were unrelated to infant working memory performance.

Conclusion: These findings suggest that fetal exposure to maternal stress may be uniquely associated with reduced infant working memory independent of concurrent or ongoing maternal perceptions of stress.

Presenter:	Matthew Geramita, MD PhD
Current Position:	Resident
Title:	**Independent patterns of abnormal LOFC activity during reversal learning and perseverative grooming in a mouse model of compulsive behaviors**
Author(s):	*Geramita MA , Manning EE , Piantadosi SC , Ahmari SE*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Patients with obsessive-compulsive disorder (OCD) display disrupted performance and abnormal lateral orbitofrontal cortex (LOFC) activity during reversal learning tasks, yet it is unknown whether compulsions and reversal learning deficits share a common neural substrate. To answer this question, we measured neural activity with in vivo calcium imaging in LOFC during compulsive grooming and reversal learning before and after fluoxetine treatment.

Methods: Sapap3-knockout (KO) mice were used as a model for OCD-relevant behaviors. Sapap3-KOs and wildtype (WT) littermates were injected with virus encoding GCaMP6f and implanted with gradient-index lenses to visualize LOFC activity using miniature microscopes. Grooming, reversal learning, and neural activity were measured pre- and post-fluoxetine treatment.

Results: In KOs, baseline increases in the number of grooming bouts and impairments in reversal learning as measured by the number of correct lever presses improved after fluoxetine treatment. Additionally, KOs displayed distinct patterns of abnormal LOFC activity during grooming and reversal learning, both of which normalized after fluoxetine. During grooming, baseline increases in the percentage of KO LOFC neurons inhibited by grooming decreased after fluoxetine. During reversal learning, baseline decreases in the strength by which KO LOFC neurons were modulated by the correct lever press improved after fluoxetine. Finally, encoding of reversal learning and compulsive behavior are independent, as reversal learning-associated neurons are distributed randomly amongst grooming-associated neurons (i.e. overlap is what would be expected by chance).

Conclusion: In OCD, the LOFC is disrupted during both compulsive behaviors and reversal learning, yet whether these behaviors share common neural underpinnings is unknown. We find that the LOFC plays distinct and independent roles in compulsive grooming and impaired reversal learning and their improvement with fluoxetine in a mouse model. These findings suggest that LOFC plays separate roles in pathophysiology and treatment of different perseverative behaviors in OCD.

Presenter:	Andrew Gerlach, PhD
Current Position:	Postdoc Scholar
Title:	**Early response to antidepressant treatment in late-life depression**
Author(s):	*Gerlach AR , Karim HT , Aizenstein HJ , Andreescu C*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: The slow treatment course of major depressive disorder results in delays in recovery exacerbate the personal, social, and even economic costs. This problem is amplified in late-life depression (LLD). Improved understanding of antidepressant action and identification of biomarkers of early treatment response in LLD are a major strategic goal of neuroimaging research. Current literature indicates that the anterior cingulate cortex (ACC), a region associated with cognitive reappraisal and emotion processing and regulation, may be one of the neural markers associated with treatment response.

Methods: Thirty-three depressed, cognitively intact participants (>60 yo) were recruited to undergo SSRI or SNRI antidepressant treatment for twelve weeks. Remission was defined as MADRS < 10. We collected resting state fMRI at baseline and one day after commencing antidepressant treatment. One-day changes in functional connectivity of subgenual, rostral, and dorsal subdivisions of the ACC were investigated in the entire sample as well as group differences between remitters and non-remitters. Significance was assessed through permutation testing on voxel-wise t-tests.

Results: Differences between baseline and day one connectivity from all three ACC seeds revealed a similar cluster of increased connectivity to the dorsomedial prefrontal cortex. Additional clusters of increased connectivity were found in the left insula/inferior frontal gyrus, and left middle frontal gyrus/superior frontal gyrus/precentral gyrus. Remitters showed greater one-day increases in connectivity between the dorsal ACC and the right temporoparietal junction compared to nonremitters.

Conclusion: Increased connectivity between key regions of the salience and default mode networks are identifiable after one day of antidepressant treatment. Remission was associated with a greater increase between the dorsal ACC and right temporoparietal junction, which has been linked to both persistent negative thinking and cognitive reappraisal. These results suggest early network-level changes in remitters that may represent neural remodeling prior to remission and have translational potential to help guide treatment decisions.

Presenter:	Merage Ghane, PhD
Current Position:	Postdoc Associate
Title:	**Effect of continuous theta burst stimulation on cortical and subcortical reward circuitry**
Author(s):	*Ghane M , Graur S, Chase H , Conrad T , Skeba A , Kaskie R , Janssen S , Bonar L , Ferrarelli F , Phillips M*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Bipolar disorder is characterized by hypo/manic episodes, resulting in interfering impulsivity, reward sensitivity, and/or sensation-seeking. Elevated left ventrolateral prefrontal (vlPFC) activity during reward-expectancy shows associations withp hypo/mania risk. Our aim was to provide proof-of-concept that one of three continuous theta-burst stimulation (cTBS) conditions would inhibit vlPFC and reduce activity in reward circuitry.

Methods: Eight participants (2 Male, 6 Female; MAge(SD) = 24.3(2.89)) completed three cTBS sessions (stim-targets: sham, left_vlPFC, left_somatosensory). Participants underwent fMRI pre- and post-cTBS while completing an uncertain reward-expectancy task. Standard preprocessing was conducted (fMRIPrep). Due to ongoing clinical trial, experimenters are blinded to diagnosis and stim-type (hereafter stim-type A, B, and C). We used a repeated measures ANOVA (MRM) to test whether change in reward-expectancy activity from pre-to-post cTBS varied as a function of stim-type.

Results: There was a whole-brain effect of stim-type on change in cortical and subcortical reward circuitry and related networks (6000 permutations, uncorrected-alpha = .001). ROI-based analyses showed an effect of stim-type in left vlPFC (F = 30.98, p = .004). Stim-type B showed negative change in vlPFC from pre- to post-cTBS (M-StimB = -.431, 95%CI = .293), while stim-types A and C showed positive change (M-StimA = .198, 95%CI = .444; M-StimC = .217, 95%CI = .368).

Conclusion: Results show proof-of-concept for an effect of stim-type on reward-expectancy activity in the vlPFC, and in cortical and sub-cortical reward circuitry. Future research will extend findings to a larger sample and test for a causal role of vlPFC in hypo/mania related affect and reward sensitivity.

Presenter: Jordan Gilardi, BS

Current Position: Staff

Title: **Protein phosphorylation is robustly dysregulated in the primary auditory cortex of schizophrenia**

Author(s):   *Gilardi J , Salisbury R , Garver M , Newman J , Ding Y , Grubisha M , DeGiosio R , Sweet R , MacDonald M*

Affiliation(s):   *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Pathologic alterations to synaptic protein networks are believed to underlie synapse loss and disease symptoms in schizophrenia. Phosphorylation plays an important role in synaptic protein trafficking and activity. Here, we utilize phosphoproteomic mass spectrometry to analyze human postmortem brain tissue from schizophrenia and matched control subjects, identifying synaptic phosphoprotein and phosphoprotein network alterations linked to spine loss in schizophrenia.

Methods: Homogenates were prepared from right hemisphere auditory cortex grey matter from 43 schizophrenia and 41 matched control subjects. Samples were digested with trypsin, barcoded with TMT, subject to phosphopeptide enrichment by Fe^{3+} cartridges on an AssayMAP Bravo, and analyzed on an Orbitrap Eclipse Mass Spectrometer.

Results: We observed 11,720 phosphopeptides, 7,240 of which were quantified with > 50% presents call. Of these phosphorylation sites, 1807 were significantly dysregulated in schizophrenia (q < 0.05) accounting for multiple hypothesis testing. Proteins with dysregulated phosphosites were significantly enriched for terms relating to both postsynaptic (p = 3.95E-48) and presynaptic function (p = 4.93E-32). We are currently investigating associations between altered protein phosphorylation and dendritic spine loss in this cohort. One phosphorylation site on the PALM1 (S116) was significantly associated with spine loss in tissue, and expression of the phosphomimic (S116D) induced spine loss in primary neuronal culture. We are currently attempting to map kinase activation states in this cohort.

Conclusion: Schizophrenia individuals exhibit altered phosphoproteome expression.

Presenter: Ariel Gildengers, MD

Current Position: Faculty

Title: **Anticholinergic drug burden and risk of incident MCI and dementia - A population-based study**

Author(s):   *Gildengers AG[1] , Stoehr GP[2] , Ran X[3] , Jacobsen E[1] , Chang CH[4] , Ganguli M[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

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[4]Internal Medicine, University of Pittsburgh School of Medicine

Introduction: Older adults commonly take anticholinergic drugs that may have long-term adverse cognitive effects. We investigated whether anticholinergic drug use was related to developing mild cognitive impairment (MCI) or dementia in cognitively normal older adults at the population level.

Methods: We examined time to incident MCI (CDR=0.5) and incident dementia (CDR >=1) among participants who were cognitively normal at baseline (CDR=0). In survival analysis (Cox models), adjusted for age, sex, and education, and overall morbidity reflected in total number of prescription medications, we assessed whether developing MCI or dementia was associated with 1) any anticholinergic drug use, 2) total ACB score, or 3) number of anticholinergic drugs taken. All models included an interaction term between anticholinergic drug use and APOE*4.

Results: Taking any anticholinergic drug was significantly associated with higher risk of developing MCI; however, higher ACB score or higher number of anticholinergic drugs, compared with lower, were not associated with greater risk of developing MCI. We found no significant relationship between anticholinergic use and developing dementia. The relationship between anticholinergic use and cognitive outcome was not affected by APOE genotype.

Conclusion: Among cognitively normal older adults in a population-based sample, anticholinergic drug use is independently associated with subsequently developing MCI, but not dementia. Thus, anticholinergic drug use may influence risk of MCI that does not progress to dementia, and could be a potentially modifiable risk factor for MCI.

Presenter:	Alexandra Gogola, MS
Current Position:	Staff
Title:	**Considerations for a universal tau PET reference region**
Author(s):	*Gogola A[1] , Minhas DS[1] , Lopresti BJ[1] , Laymon CM[1] , Tudorascu DL[2] , Cohen AD[2] , Snitz BE[3] , Mathis C[1] , Klunk WE[2] , Villemagne VL[2]*
Affiliation(s):	*[1]Department of Radiology, University of Pittsburgh School of Medicine*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine
	[3]Department of Neurology, University of Pittsburgh School of Medicine

Introduction: Tau PET tracers exhibit varying patterns and degrees of off-target binding, potentially confounding tau load quantification. We examined subject-specific data-driven methods to refine a cerebellar gray matter (GM) reference region that avoids off-target binding and spill-over contamination apparent in 18F-flortaucipir (FTP) and 18F-MK-6240 (MK) PET images.

Methods: 75 FTP (80-100min post-injection) and 15 MK (70-90min post-injection) PET scans were visually inspected for superior cerebellar GM binding and meningeal off-target retention. All tau PET images were acquired on a Siemens Biograph mCT and transformed to MNI space using SPM12's Unified method. An initial cerebellar GM region was generated from the spatially unbiased infratentorial template cerebellum atlas. The iterative outlier (IO) method and Gaussian Mixture Model (GMM) fitting were applied to cerebellar GM standardized uptake value (SUV) distributions on an individual subject basis to eliminate voxels corresponding to off-target binding and spill-over. Both approaches were applied independently to filtered back-projection (FBP) and ordered subset expectation maximization (OSEM; 4 iterations 24 subsets) reconstructions.

Results: Eight FTP PETs presented superior cerebellar off-target retention, and 7 MK PETs presented meningeal retention with spill-over into the cerebellum. IO and GMM methods performed similarly for FBP and OSEM, and in removing superior cerebellar voxels with off-target retention from FTP PET images. However, GMM removed more voxels contaminated by meningeal spill-over. The GMM-refined cerebellar reference region resulted in increased cerebellar SUV and decreased cortical tau SUVR outcomes in males relative to females. Female cerebellar SUVs and cortical SUVRs were relatively unchanged.

Conclusion: GMM appears to outperform IO in identifying cerebellar voxels contaminated with spill-over from meningeal off-target binding in 18F-MK-6240 SUV images. Sex-specific differences in off-target binding of tau PET tracers may confound measurements of cortical tau load without appropriate correction or reference region refinement. Future work will consider additional tau PET tracers; multi-site and multi-scanner data; and additional reconstruction methods.

Presenter:	Lidush Goldschmidt, PhD
Current Position:	Staff
Title:	**Change in marijuana use from adolescence to young adulthood and its relation to gestational alcohol and marijuana exposure**
Author(s):	*Goldschmidt L , De Genna NM , Richardson GA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Many studies have examined changes in marijuana use across adolescence. However, fewer studies have examined factors associated with marijuana use transitions from adolescence to young adulthood. In this longitudinal study, we examined prenatal exposures to alcohol and marijuana, and adolescent risk/protective factors that best distinguished between abstinence, continuity, or cessation of cannabis use from 16 to 22 years.

Methods: Data from the Maternal Health Practices and Child Development Project at baseline (prenatal) and the 16 and 22-year follow-up phases were used in this study. Participants were of lower socioeconomic status with an average of 12.8 years of education and 46% were male. Participants' frequency and quantity of use over the past year were used to determine change in use. A discriminant analysis was applied to distinguish between the identified groups. The risk factors considered included demographics, adolescent characteristics, home environment, and prenatal exposures.

Results: Four categories of use were defined based on the rates of use from 16 to 22 years: non-users (n=193), stop/decrease (n=81), continue at same level/increase (n=81), and initiation after 16 years phase (n=122). The factors that best distinguished between these groups were peer use, status offenses, caregivers' financial strain, prenatal exposure to alcohol and marijuana and race. These factors were divided into two significant discriminant functions (eigenvalues equal to 0.51 and 0.05).

Conclusion: Prenatal alcohol and marijuana exposure were significantly related to transitions of marijuana use from adolescence to young adulthood, after considering peers' use, parental supervision, behavior problems, and home environment. While gestational marijuana exposure was more likely to be associated with early initiation/increasing use, alcohol exposure was related to later initiation. Pregnant women should be warned about the long-term effects of their substance use on their offspring.

Presenter:	Tina Gupta, MA
Current Position:	Staff
Title:	**Mechanisms of heterogeneity in transdiagnostic anhedonia in adolescents**
Author(s):	*Gupta T[1] , Eckstrand K[1] , Haas GL[2] , Silk JS[1] , Ryan ND[1] , Phillips ML[1] , Forbes EE[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Departments of Psychology and Psychiatry, University of Pittsburgh, VA Pittsburgh Healthcare System

Introduction: Anhedonia is a transdiagnostic symptom of severe mental illness that often precedes illness onset and develops during adolescence. To characterize and treat anhedonia, it is imperative to identify its possible subphenotypes and their neural mechanisms.

Methods: As such, in this study, adolescents at risk for psychopathology (low/high genetic risk for schizophrenia, bipolar disorder, or depression) (N=82) completed consummatory, anticipatory, and social anhedonia measures and fMRI scanning during a monetary reward task (collected 1 year prior). Anhedonia subgroups were identified using a k-means clustering approach and differences in demographics, affective processes, and impulsivity were examined. Furthermore, relationships between bold signal response (dmPFC and VS) and behavioral measures were assessed as well.

Results: Findings revealed two subgroups that emerged: (1) anhedonia group (N=41) characterized by anticipatory and consummatory anhedonia and, (2) normative group (N=41) reflecting low levels. Interestingly, there were no cluster group differences in demographics including in the distribution of risk categories; the distribution of low and high risk was relatively similar between groups. The anhedonia group reported more suicidality ($p = 0.028$, ?p2 = 0.06), negative affect ($p = 0.03$, ?p2= 0.06), and less desire for emotional closeness ($p < 0.001$, ?p2 = 0.37) compared to the normative group. Furthermore, dmPFC bold signal response 1 year prior was associated with suicidality within the anhedonia group ($r = 0.46$, $p = 0.03$).

Conclusion: Taken together, unique profiles of anhedonia may emerge transdiagnostically and vary on clinical features and reward-circuit function. These data inform our understanding of the development of anhedonia and could further development of treatment strategies for those at risk for psychopathology.

Presenter:	Maria Guzman, BA
Current Position:	Staff
Title:	**Stress and discrimination as predictors of alcohol and cannabis use during COVID-19**
Author(s):	*Guzman MC , Anderson C , Gwennap LB , Holmes JE , Pedersen SL*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Research has found that average stress levels and alcohol consumption in young adults significantly increased during the COVID-19 pandemic (Grossman et al., 2020). Additionally, the pandemic has exacerbated preexisting inequities for Black Americans, which could lead to increases in alcohol and cannabis use to cope with elevated stress. The current project begins to test this possibility by examining how stress and discrimination experiences during the COVID-19 pandemic relate to alcohol and cannabis use.

Methods: Participants were 80 young adults (Mage=25.5, 71% assigned female at birth, 62% self-identified as Black). Participants completed an initial survey prior to the onset of the pandemic and an additional COVID-19 assessment (July-October of 2020). The current project focuses on self-reported stress in the past month, 5 domains of discrimination in the past month, frequency of past month binge drinking and cannabis use during the COVID-19 follow up.

Results: Higher self-reported stress was marginally associated with more frequent past month binge drinking during the COVID-19 pandemic (B=.20, p=.08) but was not significantly associated with past month cannabis use frequency (B=.04, p=.735). Within the subsample of Black participants, one domain of discrimination (being treated like a second class citizen/assumptions of criminality) was marginally associated with frequency of past month binge drinking (B=.28, p=.08). Discrimination domains were not significantly associated with cannabis use.

Conclusion: While only 31% of the sample reported that their drinking had increased because of the pandemic, our results found tentative support for stress and discrimination relating to heavy alcohol use during this time. Interestingly, these associations were not found for cannabis use. Additional analyses including pre-COVID levels of alcohol/cannabis use and vicarious experiences of discrimination (e.g., seeing offensive content about people of your race online: 74% of Black participants reported this ? monthly compared to 20% of White participants) will be conducted to extend these initial findings.

Presenter: Kiera James, PhD

Current Position: Postdoc

Title: **Neural reactivity to parental praise: Links to real-world functioning**

Author(s): *James KM[1] , Sequeira SL[1] , Silk JS[1] , Dahl RE[2] , Forbes EE[3] , Ladouceur CD[3]*

Affiliation(s): *[1]Department of Psychology, University of Pittsburgh*

[2]School of Public Health, University of California at Berkeley

[3]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Neural reactivity to social threat has been identified as one possible mechanism of risk for psychopathology in youth. However, more research that integrates findings across multiple units of analysis is needed to hone conceptual models of risk. This study aimed to provide insight into how neural responses to parental criticism, a salient and meaningful form of social threat during adolescence, are associated with real-world measures of affective reactivity. We predicted that youth who exhibit greater reactivity to parental criticism (versus neutral feedback) in the subgenual anterior cingulate cortex (sgACC), amygdala, and anterior insula would report experiencing (a) less happiness during day-to-day positive interpersonal situations and (b) more sadness and anger during day-to-day negative interpersonal situations.

Methods: Participants were 44 youth aged 11-16 (57% female) with a history of anxiety. Participants completed a 10-day ecological momentary assessment protocol and a neuroimaging task in which they listened to previously recorded audio clips of their parents' criticism and neutral comments. Mixed-effects models were used to test associations between neural activation to criticism (vs. neutral) feedback and emotions in interpersonal situations, controlling for age, gender, time, and presence of a current anxiety disorder.

Results: Youth who exhibited more activation in the sgACC to parental criticism reported less happiness during daily positive interpersonal situations (B=-.14, SE=.05, p=.013). No significant neural predictors of negative emotions (i.e., sadness, anger) in response to negative interpersonal situations emerged (uncorrected ps>.05).

Conclusion: These findings suggest youths' neural reactivity to social evaluation, such as parental criticism, is linked to important differences in day-to-day experiences of emotion during positive interpersonal situations, which provides a valuable, real-world correlate of fMRI findings.

Presenter: Emma Jardas, BS

Current Position: Staff

Title: **Minority stress and mental health among diverse gender minority youth**

Author(s): *Jardas E[1], Ladd B[2], Maheux A[2], Choukas-Bradley S[2], Salk R[1], Thoma B[1]*

Affiliation(s): *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Psychology, University of Delaware

Introduction: Gender minority (GM) youth are at heightened risk for mental health problems, purportedly due to their experiences of gender minority stressors. However, few studies have examined how GM stressors are associated with depression and anxiety among GM youth. Furthermore, no prior studies have investigated how GM stressors mediate associations between race/ethnicity and mental health within diverse samples of GM youth.

Methods: A nationwide online cross-sectional survey of 1,943 14- to 18-year-old GM adolescents in the US assessed GM stressors (prejudice events, expectations of rejection, internalized transnegativity, and concealment). Structural equation modeling was used to examine how GM stressors mediate associations between race/ethnicity and depressive and anxiety symptoms.

Results: Higher levels of each GM stressor were related to higher depressive and anxiety symptoms. Black and Asian American/Pacific Islander adolescents experienced lower mental health symptoms via fewer GM prejudice events and expectations of rejection as compared to White youth.

Conclusion: GM stressors are systematically associated with mental health symptoms among GM youth, and GM stressors mediate associations between race/ethnicity and mental health in this population. Researchers and clinicians should be attuned to how intersectional identities are related to stress and mental health among diverse GM youth.

Presenter: Meilin Jia-Richards, PhD

Current Position: Postdoc Scholar

Title: **Higher corticostriatal fractional anisotropy at 9-10 years predicts urgency at 11-12 years: Preliminary evidence**

Author(s):   *Jia-Richards M[1] , Wang F[1] , Bachrach RL[2] , Versace A[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Center for Health Equity Research and Promotion and the Mental Illness Research, Education, and Clinical Center, VA Pittsburgh Healthcare System

Introduction: Urgency, the tendency to act rashly in response to extreme positive and negative emotions is associated with risk for several psychiatric conditions. Due to typical neurodevelopmental processes, adolescents may be particularly susceptible to risky behaviors (e.g., substance use) linked to high levels of urgency. We sought to identify the extent to which an indirect index of fiber collinearity (fractional anisotropy; FA) in white matter tracts implicated in risky behaviors (i.e., corticostriatal tracts; CS) could help predict urgency two years later.

Methods: Adolescent Behavior Cognitive Development (ABCD) study data from 305 participants (49% female, 56% White, 15% Black, 16% Hispanic, 12% Other) with no major neurologic/psychiatric conditions or exposure to alcohol/other substances were included. Two linear regression models were used to assess the effects of left and right CS mean FA at 9- to 10-years old on urgency (abbreviated youth UPPS-P scale) at 11- to 12-years while controlling for baseline urgency, sociodemographic factors (age, sex, race, pubertal level, parental income), and study site.

Results: Baseline urgency accounted for 6.5% (p<.001) of variance in urgency at follow-up. Left and right CS FA accounted for an additional 1.0% (p=.067) and 1.4% (p=.030) of variance, respectively. FA in right CS tracts (ß=.58, SE=.27, p=.030) and to a lesser extent in left (ß=.49, SE=.27, p=.068) was positively associated with urgency at follow-up, suggesting that fiber collinearity in tracts implicated in risky behaviors could help explain higher levels of urgency at follow-up above what could be explained by baseline urgency alone.

Conclusion: Future work should examine whether developmental changes in CS white matter are also related to changes in urgency in childhood and adolescence and whether this information could help better predict the emergence of urgency-related psychiatric conditions (e.g., substance use disorders, eating disorders) in adolescence.

Presenter:	Riley Jouppi, BA
Current Position:	Undergraduate or Graduate Student
Title:	**Associations among sleep, diet, and gestational weight gain in a sample of pregnant individuals with overweight and obesity**
Author(s):	*Jouppi RJ[1] , Levine MD[1,2]*
Affiliation(s):	*[1]Department of Psychology, University of Pittsburgh*
	[2]Departments of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Emerging evidence suggests prenatal sleep health may associate with diet quality and calorie consumption. The relationship between dietary intake and weight gain creates reason to hypothesize sleep and diet may impact weight gain during pregnancy, yet no pregnancy study has examined these relationships concurrently. Thus, the current study aimed to examine sleep-diet, sleep-gestational weight gain (GWG), and diet-GWG relationships among pregnant individuals with overweight and obesity.

Methods: Pregnant individuals with pre-pregnancy BMI = 25kg/m2 were recruited to take part in a larger longitudinal study. Participants at 12-20 weeks gestation (N = 126) were included in the present analyses if they completed the Pittsburgh Sleep Quality Index (PSQI), had dietary recall data to calculate Healthy Eating Index-2015 scores, and had weight data to calculate GWG. General linear modeling tested relationships among global sleep quality, diet quality, calorie consumption, and GWG.

Results: PSQI global sleep quality at 12-20 weeks gestation did not significantly predict diet quality ($R2 = .02$, $F(1, 124) = 1.99$, $p = .16$) or calorie consumption ($R2 = .00$, $F(1, 124) = 0.06$, $p = .80$) at 12-20 weeks gestation, nor total GWG ($R2 = .01$, $F(1, 124) = 0.78$, $p = .38$). Diet quality did not significantly predict GWG ($R2 = .01$, $F(1, 125) = 0.67$, $p = .41$); however, calorie consumption related to total GWG ($R2 = .032$, $F(1, 125) = 4.18$, $p = .04$).

Conclusion: In this sample of pregnant individuals with overweight and obesity, there was no evidence that sleep health associated with dietary intake or GWG, nor of a relationship between diet quality and GWG. The current study did find calorie consumption significantly predicted GWG in this sample. Results contradict those from nonpregnant populations, which consistently found that sleep significantly predicts diet and weight. Replication is warranted, and future research should explore other potential contributions to GWG.

Presenter: Zoe Karavolis, PharmD

Current Position: Resident

Title: **Efficacy of clonidine versus buprenorphine/naloxone for opioid withdrawal at a psychiatric hospital**

Author(s):   *Karavolis Z[1] , Fielding K[1] , Reid T[1] , Fabian T[2]*

Affiliation(s):   *[1]Department of Pharmacy, UPMC Western Psychiatric Hospital*

                      [2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: A common manifestation of opioid use disorder and reason for presentation to healthcare settings is opioid withdrawal. Pharmacotherapy for opioid withdrawal management is recommended. While treatment practices may vary slightly by institution, the most frequently used agents are clonidine and buprenorphine/naloxone. The objective of this project is to evaluate the effectiveness of the opioid withdrawal treatments clonidine and buprenorphine/naloxone.

Methods: A computer-generated list of patients discharged from UPMC Western Psychiatric Hospital who received either clonidine or buprenorphine/naloxone for opioid withdrawal between was obtained. The primary outcome was change in clinical opioid withdrawal scale (COWS) score after medication administration. Secondary outcomes included 30-day readmission, utilization of as needed medications hydroxyzine, trazodone, loperamide, and naproxen, absence of opiates on urine toxicology 30 days post-discharge, discharge against medical advice, initiation of maintenance medication for OUD, and follow-up.

Results: There were 170 patient encounters initially analyzed for this project. Average change in COWS score was 5.0 points for the clonidine group and 5.4 points for the buprenorphine/naloxone group. The clonidine group had a 30 day-readmission rate and 30-day urine toxicology positive for opiates of 4.7% and 67%, respectively, while buprenorphine/naloxone had rates of 2.6% and 40%. Discharge against medical advice occurred in 12.8% of the clonidine group and 2.6% of the buprenorphine/naloxone group. There was a 65.1% rate of follow-up in the clonidine group and a 76.3% rate in the buprenorphine/naloxone group.

Conclusion: There was no clinically significant difference in the change in COWS score between groups. Buprenorphine/naloxone in comparison to clonidine for opioid withdrawal resulted in a lower rate of 30-day readmission, lower percent of 30-day urine toxicology positive for opiates, less discharge against medical advice, and increased rates of follow-up after discharge.

Presenter:	Nithya Kasibhatla, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Relationships among childhood adversity, central visceral brain regions and adulthood cardiovascular stress reactivity in a transdiagnostic sample enriched for abuse**
Author(s):	*Kasibhatla NP[1] , Banihashemi L[2]*
Affiliation(s):	*[1]Department of Neuroscience, University of Pittsburgh*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Numerous studies have shown that adverse childhood experiences (ACEs) affect stress reactivity, including cardiovascular responses, later in life. Central visceral, stress-responsive neural circuits comprising the hypothalamic paraventricular nucleus (PVN), bed nucleus of the stria terminalis (BNST), amygdala, and subgenual anterior cingulate cortex (sgACC) may mediate this relationship. These regions are involved in the control of cardiovascular activity, as evidenced by studies in preclinical models. Limited research has addressed the role of central visceral circuits in mediating the relationship between ACEs and cardiovascular stress reactivity. The goal of the present study is to examine relationships among ACEs, central visceral circuits and cardiovascular stress reactivity in a transdiagnostic sample enriched for childhood physical abuse.

Methods: Young adult participants (n = 97, mean age = 27.3) engaged in a functional magnetic resonance imaging (fMRI)-adapted multisource interference task (MSIT) to elicit central visceral circuit activity. In-scanner recordings of heart rate (HR) and blood pressure were recorded (mean arterial pressure, MAP, was used for analyses). The Childhood Trauma Questionnaire provided a measure of childhood abuse.

Results: Hierarchical regression analyses were performed covarying for age, sex and race. Results revealed negative curvilinear relationships between childhood abuse and both baseline (? = -1.230, p = 0.026) and stressor-evoked HR (? = -1.202, p = 0.026), but not HR reactivity (? = 0.073, p = 0.899). Additionally, results revealed a positive linear association between amygdala reactivity and MAP reactivity (? = 0.328, p = 0.002). Positive linear associations were also revealed between PVN reactivity and baseline (? = 0.194, p = 0.044) and stressor-evoked MAP (? = 0.180, p = 0.054) and baseline (? =0.298, p = 0.004) and stressor-evoked HR (? = 0.242, p = 0.018).

Conclusion: Our findings indicate that central visceral circuit reactivity may be a neural pathway by which childhood adversity may contribute to cardiovascular reactivity.

Presenter: Joseph Kazan, MD

Current Position: Postdoc Scholar

Title: **Methodology of a digital health intervention to stabilize the 24-hour rhythm of sleep, meals, and physical activity among older bereaved spouses: The WELL study**

Author(s): *Kazan J[1] , Lyew T[1] , Croswell E[1] , Buysse DJ[1] , Gebara MA[1] , Karp JF[2] , Krafty RT[3] , Reynolds III CF[1] , Smagula SF[1] , Stahl ST[1]*

Affiliation(s): *[1] Department of Psychiatry, University of Pittsburgh School of Medicine*

[2] Department of Psychiatry, University of Arizona

[3] Department of Biostatistics and Bioinformatics, Emory University

Introduction: Experiencing the death of a spouse or partner is a life altering event associated with emotional and physical health problems. In the first year following spousal death, older adults are at a higher risk of developing major depressive disorder (MDD). Our randmozied controlled trial entitled "Widowed Elders' Lifestyle after Loss" (or WELL) aims to test the efficacy of a digital health intervention (DHI) that targets the timing and regularity of sleep-wake behaviors to stabilize circadian rhythms, for reducing symptoms of depression during the spousal bereavement period. This abstract describes the initial demographics and challenges in the implemntation of our DHI in the setting of the Covid-19 pandemic.

Methods: Participants 60 years and older who experienced the death of a spouse or life partner within the last 12 months were recruited. Inclusion criteria consisted of subthreshold symptoms of depression defined by a Hamilton Rating Scale score = 9, in the absence of current depression. Participants were randomized to the intervention group (including digital monitoring and motivational health coaching) or enhanced usual care. In both arms of the study multiple virtual interactions between the user, technology platform, and study team occurred, posing challenges for implementation.

Results: Many challenges can be categorized as follows: 1) recruiting virtually; 2) securing privacy; 3) optimizing retention and minimizing early attrition; 4) ensuring standardization of virtual study procedures; 5) adhering to virtual study timelines; 6) ensuring virtual communication among study staff; and 7) optimizing day-to-day operations.

Conclusion: Several challenges in transitioning our RCT to a DHI were identified. We resolved these challenges without compromising internal validity via interdisciplinary collaborations with mobile programmers to ensure our technology met the needs of older bereaved adults. The solutions from this study may advance the delivery of digital health interventions for geriatric mental health support.

Presenter:	Gargi Kelkar, MA
Current Position:	Staff
Title:	**Neural response to discrimination-based stress and its association with alcohol consumption patterns between minoritized and majority populations**
Author(s):	*Kelkar G , Pedersen S , Jones N*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Discrimination has been described as a chronic and unique stressor experienced by minoritized individuals which is associated with increased negative affect, decreased cognitive functioning, and the use of alcohol to cope. We know little regarding how minoritized versus majority individuals differ in their neural response to discrimination-based stress and its association with alcohol consumption patterns. We conducted a pilot study using a stress-inducing cognitive paradigm likely to initiate intelligence-based stereotype threat in minoritized individuals. We hypothesized that minoritized individuals would demonstrate increased negative affect, decreased cognitive efficiency (i.e., longer planning times), and increased brain activity (i.e., greater pupil dilation); and that increased arousal would be associated with alcohol consumption.

Methods: 80 participants consisting of 25 minoritized individuals (Asian 16%, Black 9%, Latine 1%, and Other 4 %) ages 18-25, (M(SD)=18.7(1.25)), 100% non-heavy drinkers 55 majority (White 100%) ages 18-30, 100% White, (M(SD)=19.2(2.51)), 91% non-heavy drinkers. These participants completed a stress inducing Tower of London (TOL) paradigm during a pupillometry assessment. Planning time, pupil dilation, and self-reports of arousal were assessed.

Results: Relative to the majority, minoritized individuals demonstrated more stress-induced arousal (e.g., anxiety, frustration) in response to stereotype threat ($F_{(1,394)}=6.98, p<.009$). Further, within minoritized individuals arousal was associated with increased planning time ($F_{(1,76)}=7.60, p=.007$), and increased pupil dilation ($F_{(443.4)}=3.02, p=.004$). Increased arousal and pupil dilation during the task were associated with consuming fewer alcoholic beverages/week (B(SE)=-0.46(0.48), p=.002, B(SE)=-0.41(3.23), p=.006).

Conclusion: Minoritized individuals experienced increased arousal, diminished cognitive efficiency, and increased brain activity when experiencing stereotyped threat. Supportive of the fact that discrimination-based stress significantly impacts functioning and is suggestive of neural differences in processing the threats. Interestingly, arousal was associated with decreased rather than increased weekly alcohol consumption, which may be a function of not taking dispositional drinking motives into account.

Presenter: Kyle Ketchesin, PhD

Current Position: Faculty

Title: **Diurnal alterations in gene expression across striatal subregions in psychosis**

Author(s):   *Ketchesin KD¹ , Zong W² , Hildebrand MA¹ , Scott MR¹ , Seney ML¹ , Shankar VG¹ , Glausier JR¹ , Lewis DA¹ , Tseng GC² , McClung CA¹*

Affiliation(s):   *¹Department of Psychiatry, University of Pittsburgh School of Medicine*

²Department of Biostatistics, University of Pittsburgh

Introduction: Psychosis is a defining feature of schizophrenia and highly prevalent in bipolar disorder. Notably, individuals suffering with these illnesses also have major disruptions in sleep and circadian rhythms, and disturbances to sleep and circadian rhythms can precipitate or exacerbate psychotic symptoms. Psychosis is associated with the striatum, though no study to date has directly measured molecular rhythms and determined how they are altered in the striatum of subjects with psychosis.

Methods: Here, we perform RNA-sequencing and both differential expression and rhythmicity analyses to investigate diurnal alterations in gene expression in human postmortem striatal subregions (nucleus accumbens (NAc), caudate, and putamen) in subjects with psychosis relative to unaffected comparison subjects.

Results: Across regions, we find differential expression of immune-related transcripts and a substantial loss of rhythmicity in core circadian clock genes in subjects with psychosis. In the NAc, mitochondrial-related transcripts have decreased expression in psychosis subjects, but only in those who died at night. Additionally, we find a loss of rhythmicity in small nucleolar RNAs and a gain of rhythmicity in glutamatergic signaling in the NAc of psychosis subjects. Between region comparisons indicate that rhythmicity in the caudate and putamen is far more similar in subjects with psychosis than in matched comparison subjects.

Conclusion: Together, these findings reveal differential and rhythmic gene expression differences across the striatum that may contribute to striatal dysfunction and psychosis in psychotic disorders.

Presenter:	Sam-Moon Kim, PhD
Current Position:	Postdoc Associate
Title:	Disruptions in circadian rhythms and sleep during adolescence induces changes in impulsivity, cognitive function, and gene expression in reward-related brain regions
Author(s):	*Kim SM , Cerwensky A , Wright M , Egazarian A , Zeak J, Migias Y , Seney M , Huang Y , Torregrossa M , McClung CA*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Circadian clocks regulate reward mechanisms, and circadian disruption is a risk factor for substance use disorders (SUDs). Adolescence is a vulnerable period for both circadian disruption and the development of SUDs. The interaction between circadian clocks and reward pathways is a critical aspect to the development of SUDs in adolescence, but the molecular mechanisms underlying this link are not fully understood. Thus, the goal of this study is to understand how genetic and environmental disruptions of circadian rhythms contribute to vulnerability to addiction during adolescence.

Methods: To understand the relationship between natural variations in circadian traits and addiction, we performed high-throughput circadian phenotyping and the 5 choice serial reaction time task (5CSRTT) using Heterogenous Stock (HS) adolescent rats (P28-48). To address effects of circadian disruption on reward function, the 5CSRTT was conducted following a chronic jet-lag paradigm (12h light shift every 3 days). In addition, we analyzed transcriptomes in prefrontal cortex (PFC) and nucleus accumbens (NAc) after acute sleep disruption (ZT0 to ZT6).

Results: Due to their genetic heterogeneity, HS rats displayed high phenotypic diversity, and we observed strong correlations between circadian rhythms, impulsivity and cognitive functions. Interestingly, rats exposed to chronic jet-lag took longer to acquire the 5CSRTT and showed decreased impulsivity and cognitive function compared to the control group. Also, we found that acute sleep disruption induced similar changes in gene expression in PFC and NAc, but more robust effects in PFC (703 and 1144 differentially expressed genes in NAc and PFC, respectively).

Conclusion: Overall, our data demonstrate that genetic abnormality and environmental misalignment of circadian rhythms during adolescence alter addiction-related behaviors and gene expression in reward-related brain regions providing information to elucidate the mechanisms underlying the interaction between circadian rhythms and addiction.

Presenter:	Antonija Kolobaric, ScB
Current Position:	Undergraduate or Graduate Student
Title:	**Number two when feeling blue: characterizing microbiome alterations in late life depression**
Author(s):	*Kolobaric A[1], Jašarevic E[2], Karim HT[3], Aizenstein HJ[3], Andreescu C[3], Son SJ[4]*
Affiliation(s):	*[1]Center for Neuroscience, University of Pittsburgh*
	[2]Department of Obstetrics, Gynecology and Reproductive Sciences, University of Pittsburgh
	[3]Department of Psychiatry, University of Pittsburgh School of Medicine
	[4]Department of Psychiatry, Ajou University

Introduction: Depression is the leading cause of disability worldwide, and late life depression (LLD) is specifically susceptible to poor treatment response and remission outcomes. Given that less than 30% of patients with LLD respond to the initial pharmacological intervention, the development of more effective treatment strategies is of critical importance. Recent animal and human studies suggest that microbiota plays an important role in cognitive abilities, social behavior, responsiveness to stressors, and overall psychological well-being. Microbial communities synthesize a wide array of nutrients, neurotransmitters, hormones, and immune factors that have potent effects on distal tissues, including the central nervous system. In this project, we sought to establish novel associations between the microbiota, cognitive impairment, and mental illness in participants with Mild Cognitive Impairment (MCI) with varying levels of depression.

Methods: We collected cognitive, clinical, and demographic assessments as well as stool samples from geriatric participants with MCI (N=50 not depressed, N=151 depressed).
Microbial community diversity, structure, and composition was assessed using high-resolution 16S rRNA markers gene sequencing. Specifically, we computed alpha diversity using Shannon's Diversity Index to identify the richness (number) and distribution (evenness) within samples. Next, we computed beta diversity to characterize differences between participants with and without depression. Finally, we conducted microbial community analysis to identify individual taxa with different relative abundances between the two groups.

Results: We found that depression was associated with significantly increased community diversity compared with not depressed participants. These differences in community diversity were independent of significant effects of depression severity on community structure. Differential abundance analysis revealed significant differences in 20 taxa between depressed and not depressed participants.

Conclusion: Our study demonstrated that in MCI, LLD is associated with changes in the microbiota composition. This may aid in the development of future targeted interventions to ameliorate depressive symptoms in late life.

Presenter: Thomas Kraynak, PhD

Current Position: Postdoc

Title: **Associations of trait worry with amyloid burden in late life: a role for stressor-evoked brain networks**

Author(s): *Kraynak TE[1,3], Karim HT[2], Andreescu C[3]*

Affiliation(s): *[1]Departments of Epidemiology, University of Pittsburgh*

[2]Departments of Psychiatry & Bioengineering, University of Pittsburgh

[3]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Worry is a transdiagnostic symptom common to many neuropsychiatric disorders and implicated in cognitive decline and Alzheimer's disease (AD). The neurocognitive risk conferred by late-life worry may be in part mediated by altered stress-related brain function and physiological reactivity.

Methods: Eighteen amyloid-negative older adults (age 60 to 80), stratified on worry severity, underwent positron emission tomography and functional magnetic resonance imaging. We examined associations of worry severity with amyloid burden as well as brain and cardiovascular responses to a cognitive stressor task. Multivariable regression analyses accounting for age and sex examined associations within a priori brain regions of interest.

Results: Greater worry severity was associated with greater amyloid burden in the anterior cingulate cortex but was not associated with global amyloid burden. Greater worry severity was associated with greater stressor-evoked activity in the right amygdala, as well as greater effective connectivity between bilateral anterior insula and several brain regions, including the amygdala, hippocampus, anterior cingulate cortex, and periaqueductal gray. Finally, global amyloid burden was associated with greater stressor-evoked activity in the right amygdala, as well as greater effective connectivity between regions including the midcingulate cortex, amygdala, and hypothalamus. Finally, neither worry severity nor global amyloid burden was statistically associated with stressor-evoked cardiovascular reactivity.

Conclusion: These preliminary findings suggest that individual differences in late-life worry severity and preclinical amyloid burden are associated with altered stress processing in brain networks important for stress appraisal and physiological regulation.

Presenter:	Josh Krivinko, MD
Current Position:	Resident
Title:	**Loss of large dendritic spines during normal aging is mediated by alterations in discrete protein networks within the precuneus**
Author(s):	*Krivinko JM[1] , Sui Z[2] , Happe C[1] , Hensler CM[1] , McKinney BC[1] , Newman J[1] , Ding Y[2] , MacDonald ML[1] , Sweet RA[3]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Biostatistics, University of Pittsburgh School of Public Health
	[3]Department of Psychiatry, Department of Neurology, University of Pittsburgh School of Medicine

Introduction: Loss of dendritic spine density in neocortical areas is a well-known correlate of cognitive decline in Alzheimer Disease (AD); preservation of dendritic spines in subjects containing AD-related pathology is associated with cognitive resilience. Because normal aging is itself associated with dendritic spine loss, identifying mediators of dendritic spine loss may provide an opportunity to develop targeted pharmacotherapies which enhance cognitive resilience. We therefore quantified dendritic spine density and the abundance of >5000 proteins in the precuneus, a region that is selectively vulnerable in early AD.

Methods: The right precuneus was isolated postmortem from 98 subjects, ages 20-96 years, none of whom had a documented neurocognitive disorder. Quantitative immunohistochemistry/confocal microscopy were used to estimate dendritic spine density by detecting colocalization of spinophilin and actin. Gray matter was fractioned into homogenate and synaptosome fractions. Protein abundance was quantified by liquid chromatography/tandem mass tag mass spectrometry. Proteins were assembled into networks using Weighted Gene Co-expression Network Analysis and a statistical mediation analysis was used to identify proteins networks which mediate the effect of age on dendritic spine density. WebGestalt was used to identify enrichment for gene ontology terms for protein networks relative to a background of all proteins detected in homogenate.

Results: The density of large dendritic spines negatively correlated with age (Pearson R= -0.36, p<0.001). A total of 1839 of 5032 proteins detected in cellular homogenate and 914 of 4754 proteins detected in synaptosomes was significantly correlated with age (q<0.05). Proteins segregated into 19 network modules, five of which significantly mediated the effect of age on dendritic spine density. Modules were enriched for "positive regulation of excitatory postsynaptic potential" (enrichment=11.0, p=0.034), "neurotransmitter transport" (enrichment=3.9, p=0.003) and "myelination" (enrichment=21.5, p=<0.001).

Conclusion: Density of large dendritic spines declines with age within the precuneus. Network analysis revealed a novel role for myelination by oligodendrocytes in dendritic spine loss.

Presenter:	Lauren Kubic, BA
Current Position:	Staff
Title:	**Amyloid burden and maladaptive behaviors in adults with Down Syndrome**
Author(s):	*Kubic LE[1], Peven JC[1], Klunk WE[1], Laymon CM[1], Hartley SL[2], Christian BT[3], Cohen AD[1], Handen BL[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Human Development and Family Studies, University of Wisconsin - Madison
	[3]Department of Medical Physics, University of Wisconsin - Madison

Introduction: Alzheimer's disease (AD) is characterized by neuropathological changes that occur 15-20 years before the appearance of behavioral and cognitive symptoms. Increased amyloid deposition is posited to be among the earliest biomarker changes. Individuals with Down syndrome (DS) may develop AD earlier than their neurotypical counterparts due to trisomy 21, which contains the gene for APP, the precursor protein for beta amyloid. There is limited research examining the relationship between amyloid burden and behavioral symptoms in DS, including depression and social functioning. We investigated these relationships in adults with DS and hypothesized that higher amyloid burden would be associated with greater maladaptive behaviors.

Methods: Participants were 180 adults with DS from the Neurodegeneration in Aging Down Syndrome study aged 25-61 years (48.9% female). Participants underwent a positron emission tomography scan to measure amyloid burden (in centiloid values). Participants' caregivers completed the Reiss Screen for Maladaptive Behavior and the Dementia Questionnaire for People with Learning Disabilities to measure behaviors associated with psychopathology and dementia, respectively. Reiss total scores, Reiss depression subscale scores, and DLD social scale scores were variables of interest. Relationships between amyloid burden and maladaptive behaviors were examined using partial correlations controlling for age and current depression/anxiety.

Results: After controlling for age and diagnoses of depression and anxiety, higher amyloid burden was associated with more caregiver-reported overall maladaptive behaviors ($r=.19$, $p=.015$) and greater symptoms of depression ($r=.18$, $p=.027$). Higher amyloid burden was also associated with more problems in caregiver-reported social functioning ($r=.22$, $p=.007$).

Conclusion: We demonstrated that amyloid burden is closely related to maladaptive behaviors in DS, as it is in the neurotypical population. To our knowledge, this is the first study to show that behavioral symptoms in DS may be indicative of underlying neuropathological changes. This supports the need to consider both neuropathological and behavioral changes when viewing the aging DS population.

Presenter: H. Matthew Lehrer, PhD

Current Position: Faculty

Title: **Retired night shift workers exhibit poorer neurocognitive function compared to retired day workers**

Author(s):   *Lehrer HM[1] , Runk A[1] , Butters MA[1] , Buysse DJ[1] , Evans MA[2] , Hall MH[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Psychology, University of Pittsburgh

Introduction: Shift work is associated with acutely compromised cognitive function, and with chronic exposure, may place shift workers at elevated risk for dementia. However, evidence of cognitive impairment among former night shift workers is mixed, possibly due to inconsistencies regarding retirement status, work history classification, and cognitive testing. To address these limitations, this study compared neurocognitive function between retired night shift workers and retired day workers using a well-characterized sample and rigorous neurocognitive measures.

Methods: Participants (N = 61; mean age: 67.9 +/- 4.7 years; 61% females; 13% non-Hispanic White) were 30 retired night shift workers and 31 retired day workers equated on age, sex, race/ethnicity, premorbid IQ, and years in retirement. Participants completed a neurocognitive battery assessing six cognitive domains (language, visuospatial ability, attention, immediate and delayed memory, executive function) and subjective cognitive complaints. Linear regression models compared groups on individual cognitive domains, adjusting for age, sex, race/ethnicity, and education level.

Results: Compared to retired day workers, retired night shift workers scored 0.50 standard deviations lower on executive function (95% CI [-0.86, -0.13], p = 0.008) and 0.37 standard deviations lower on attention (95% CI [-0.73, -0.03], p = 0.035). Retired night shift workers also reported marginally greater subjective memory complaints (B = 0.24, 95% CI [-0.03, 0.51], p = 0.084). Neither the total duration nor recency of shift work exposure were associated with neurocognitive function among retired night shift workers.

Conclusion: The observed cognitive weaknesses in retired night shift workers suggest subtle cognitive decline that may indicate increased risk for future dementia. Retired night shift workers should be followed over time to determine whether the observed weaknesses progress.

Presenter:	Madison Lewis, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Investigating working memory functional connectivity in active and background networks among subjects with familial high-risk of schizophrenia**
Author(s):	*Lewis M[1], Theis N[2], Muldoon B[2], Prasad K[2]*
Affiliation(s):	*[1]Department of Bioengineering, University of Pittsburgh*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Working memory deficits in individuals with familial high-risk for schizophrenia (FHR) is widely reported. This study investigates the functional connectivity using NBACK task-based functional MRI data from the active regions and regions that do not show significant difference in BOLD response: the background networks. Using the "background network" may uncover underlying abnormalities that are normally overlooked because the region's BOLD response is not significantly different.

Methods: First the NBACK task-based fMRI was acquired for sixty-three subjects, twenty-five FHR who have aged beyond the highest risk period and thirty-eight healthy controls. Data was preprocessed using FSL and SPM12. Using SPM12, regions with significantly different BOLD signal amplitude were identified on a group level. These regions were tested for correlation with task accuracy and average processing time. 2-back and 0-back networks were analyzed using the HCP atlas. Average nodal measures and hub nodes were calculated.

Results: Compared to 0-back, FHR subjects showed higher BOLD response in superior temporal gyrus for 2-back and inferior parietal lobule (IPL) and middle frontal gyrus (MFG) in both 2-back and 1-back. FHR showed higher response in STG, cingulate, and thalamic regions, and lower response in IPL for 2-back. BOLD responses in IPL negatively correlated with accuracy and cingulate regions positively correlated with response time. On a global level, only 2-back average degree was significantly different between FHR and HC. No significantly different BOLD response regions were found as hubs.

Conclusion: Among FHR persons who were beyond the highest risk period, BOLD response changes were not observed in the regions usually attributed to working memory processing. Negative correlation with accuracy and positive correlation with processing time may suggest inefficient activation. Further studies of active and background networks constructed separately may uncover more significantly different graph properties.

Presenter:	João Paulo Lima Santos, MD
Current Position:	Faculty
Title:	**The role of sleep on white matter abnormalities associated with post-concussive symptoms in adolescents**
Author(s):	*Lima Santos JP[1] , Kontos AP[2] , Manelis A[1] , Iyengar S[3] , Brent D[1] , Ladouceur Cecile D[1] , Collins MW[2] , Phillips ML[1] , Versace A[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Orthopaedic Surgery/UPMC Sports Concussion Program, University of Pittsburgh
	[3]Department of Statistics, University of Pittsburgh

Introduction: Sleep disruption is associated with alterations in white matter structure in youth. Previous studies have also shown that sleep disruption after concussion is associated with worse outcomes after injury. However the effect of quality of sleep on white matter after concussion remains unclear. Using self-reported quality of sleep measures within the first week after injury (7±3days), we aimed to determine whether quality of sleep (good vs poor sleepers) has an impact on indirect measures of white matter integrity, as measured by Neurite Orientation Dispersion and Dispersion Index (NODDI), and whether this can help explain the variance of post-concussive severity reported in adolescents (12.1-17.9y) following concussion.

Methods: Post-Concussion Symptom Scale was used to assess symptom severity in 57 concussed adolescents (Mean age[SD]=15.3[1.6] years; F=40.4%). Using the Pittsburgh Sleep Quality Index, concussed adolescents were divided into two groups: good (N=33) and poor sleepers (N=24). Neurite Density Index (NDI) was used to characterize the microstructure of in 19 major white matter tracts. Thirty-three non-concussed controls (Mean age[SD]=15.2[1.5], F=54.5%) were also included as normative reference. Regularized regression was used to identify the strongest correlates of post-concussive symptoms.

Results: Relative to good sleepers (and non-concussed controls), poor sleepers showed lower NDI in 18 of the 19 tracts (P=0.029, FDR corrected P=0.048). Regularized regressions further revealed that there was a negative relationship between NDI in 4 out of the 18 tracts associated with poor quality of sleep (cingulum bundle, optic radiation, striato-premotor tract, and uncinate fasciculus) and post-concussion symptom severity and that this relationship was moderated by sex in 2 of them (cingulum bundle and optic radiation). This model explained 30% of the symptom severity (F[7,49]=4.5,P<0.001,R2=0.31).

Conclusion: Our findings suggest that good sleep quality in the few days after injury may have a protective effect on white matter integrity in major tracts in adolescents with concussion.

Presenter:	Julia Longenecker, PhD
Current Position:	Visiting Scholar
Title:	**Hierarchical symptom components in early psychosis**
Author(s):	*Longenecker JM[1] , Haas GL[1] , Salisbury DF[2]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine & VA Pittsburgh Healthcare System*
	[2]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Quantitative models of psychopathology can empirically guide sub-classification of heterogeneous clinical presentations such as psychosis; they are particularly well-equipped to capture the nuanced symptomatology observed in first-episode psychosis. As well, components may be better aligned with biological variables. The current study sought to confirm and extend knowledge of the hierarchical structure of psychosis symptoms in first-episode psychosis. Based on past hierarchical work, we hypothesized that a four component level would be most closely associated with longitudinal disability.

Methods: Participants with early-stage psychosis (N=370) underwent clinical assessment with the Scale for Assessment of Positive Symptoms (SAPS), Scale for Assessment of Negative Symptoms (SANS), and Global Assessment Scale. A subset was assessed six months (N=221) and one year later (N=207). Hierarchical symptom components were extracted at 12 levels. The predictive utility of the components for global functioning was tested.

Results: As predicted, the four-component model (reality distortion, disorganization, inexpressivity, apathy/asociality) provided superior prediction of functioning over other levels of the hierarchy. Baseline apathy/asociality longitudinally predicted functioning beyond the shared variance of the components at six months ($b =-4.83$, $t(216)= -5.37$, $p < .001$, $R^2adj = .12$) and one-year ($b =-4.49$, $t(202)= -4.38$, $p < .001$, $R^2 adj = .09$).

Conclusion: The hierarchical structure of psychotic symptomatology and its external validity have been robustly established in independent, longitudinal first-episode psychosis samples. The established model incorporates multiple levels of granularity that can be flexibly applied based on the level that offers the greatest predictive utility for external validators.

Presenter: Fran López Caballero, PhD

Current Position: Postdoc Associate

Title: **Subcortical contributions to auditory perceptual deficits in first episode psychosis as assessed by the Frequency-Following Response: Preliminary results from pilot data**

Author(s):   *López Caballero F[1] , Seebold D[1] , Brown C[2] , Salisbury DF[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Communication Science and Disorders, University of Pittsburgh

Introduction: Individuals with psychotic disorders, including schizophrenia (SZ), often experience difficulties in the discrimination of basic acoustic stimulus features, such as pitch or intensity, that contribute to higher-order cognitive symptoms, particularly social cognition. Impairments in subcortical structures within the auditory brainstem, largely unexplored in early psychosis, may contribute to these deficits, and can be assessed by using a neurophysiological index of subcortical speech sound encoding, the Frequency-Following Response (FFR).

Methods: We measured electroencephalographic (EEG) FFR to a consonant-vowel stimulus /ba/ in 7 individuals with first episode psychosis (FEP) and 7 healthy controls (C). Participants also underwent psychophysical testing to determine hearing thresholds (HT), frequency discrimination (FD), amplitude modulation (AM) and inter-aural time differences (ITD) thresholds, and completed the MATRICS neuropsychological battery of social cognition.

Results: Preliminary results from EEG suggest that the FFRs from FEP followed the periodicity of the stimulus less precisely than that of controls. FFR spectral power at the stimulus' F0 were visibly reduced in FEP as compared to C, suggesting a reduced encoding of the stimulus F0. In the psychoacoustic tests, FEP individuals had overall higher HT, FD, and AM thresholds than C. Higher FFR spectral signal-to-noise ratio values (better representation of stimulus' F0) correlated with lower FD ($r = -.57$) and AM ($r = -.9$) thresholds (smaller differences detected) in FEP. Moreover, MATRICS battery's social cognition t scores (age and gender corrected) for 5 FEP individuals were higher (better mental operations underlying social behavior) when FD thresholds were smaller (smaller pitch differences detected) ($r = -.60$).

Conclusion: Our results suggest basic auditory perceptual deficits may be present already in individuals that experience psychotic symptoms for the first time and may contribute to social cognition difficulties. The pathophysiology of such deficits may involve an impaired subcortical representation of the incoming sounds as assessed with the FFR.

Presenter:	Kelly Louie, BS
Current Position:	Staff
Title:	**Difficult life circumstances, perceived stress, and coping motives as predictors of cannabis use**
Author(s):	*Louie K , Woody ML , Andersen C , Bylsma LM , Pedersen SL*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: In predominantly White samples, cannabis use is associated with experiences with stress (e.g., Hyman & Sinha, 2009). This study examined the associations between difficult life circumstances (e.g., financial issues, mental or physical health problems, partner/spousal abuse), perceived stress, and reasons for using cannabis (motives) to identify determinants of inequities in cannabis use for Black young adults. We hypothesized that: 1) more frequent cannabis use would be associated with higher endorsement of difficult life circumstances, perceived stress, coping motives, and higher self-reported stress following a lab-based stress task; and 2) Black individuals would report higher levels of stress indices and more frequently use cannabis to cope.

Methods: Participants (N=158; Mage=24.7; 67% assigned female at birth, 53% self-identifying as Black) completed questionnaires that assessed frequency of cannabis use (past year), difficult life circumstances (lifetime), perceived stress (past month) and cannabis motives. Participants then completed a standardized stress task (TSST) where self-reported stress and physiological data were recorded.

Results: Separate regression analyses, accounting for race, sex, and age, examined the association between difficult life circumstances, perceived, stress, coping motives and frequency of cannabis use. Coping motives and difficult life circumstances were significant predictors of cannabis use frequency (ß= .489, p<.001; ß=.224, p=.008). Self-reported stress following the lab task was not associated with cannabis use. Black relative to White individuals reported more frequent cannabis use, more frequently using cannabis to cope, more difficult life circumstances, and marginally higher perceived stress.

Conclusion: As a function of structural racism, Black individuals experience more difficult life circumstances compared to White individuals. Our findings highlight the possibility that these chronic stressors contribute to cannabis use more than acute stressors and stress response. Additional analyses will incorporate physiological stress response and more directly compare different indices of stress in relation to cannabis use.

Presenter:	Laura Machlin, MA
Current Position:	Staff
Title:	**Associations between early pubertal timing and HPA dysregulation during pregnancy**
Author(s):	*Machlin L[1] , Keenan K[2] , Tung I[3] , Hipwell AE[1,4]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychiatry and Behavioral Neuroscience, University of Chicago
	[3]College of Natural and Behavioral Sciences, California State University, Dominguez Hills
	[4]Department of Psychology, University of Pittsburgh

Introduction: Animal research suggests that pubertal programming can result in aberrant HPA axis responsiveness due to hormonal changes during pregnancy (Morrison et al., 2020). While early adversity is associated with alterations to the HPA axis during pregnancy (Tung et al., 2021), no prior work has examined if pubertal timing may also alter HPA axis responsiveness during pregnancy. The current study hypothesizes that pubertal timing will be associated with stress reactivity to a social stressor measured by heart rate variability during pregnancy.

Methods: Pregnant participants were drawn from a subsample of the Pittsburgh Girls Study. The present study included 252 women (ages 22-29) who completed the Trier Social Stress Task (TSST) and had heart rate variability (HRV) data. Participants identified as Black (69.7%), White (23.7%), and multiracial (6.6%). Pubertal timing and tempo in childhood is measured as previously published (Keenan et al., 2014). Minute to minute changes in HRV during the TSST were indexed by RMSSD across acclimation, anticipation, the stress test, and the recovery period. Covariates included self-reported week of pregnancy, current age, age 18 body-mass index, and current receipt of public assistance.

Results: Early pubertal timing was associated with faster prolonged recovery measured by RMSSD following the TSST during pregnancy. Early pubertal timing or tempo was not associated with changes during acclimation, anticipation, or stress.

Conclusion: Early pubertal timing was associated with more rapid vagal recovery following a social stressor. These results are consistent with theoretical models that early pubertal timing may constitute a life stressor and the vagal system is involved in adaptive responses leading to rapid physiological recovery from acute stress.

Presenter: Kristen T. MacKenzie, PhD

Current Position: Postdoc Associate

Title: **Developing a measure of adult functional outcomes in autism spectrum disorder: Conceptual model and item generation of the Adult Functioning Scale**

Author(s):   *MacKenzie KT[1] , Beck KB[2] , Eack SM[3] , Zeglen KN[1] , Conner CM[1] , Mazefsky CA[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Rehabilitation Science and Technology, University of Pittsburgh School of Health and Rehabilitation Science

[3]Department of Psychiatry; School of Social Work, University of Pittsburgh School of Medicine

Introduction: Autistic individuals experience considerable challenges in adulthood. However, researchers lack the ability to systematically assess adult functional outcomes in autism spectrum disorder (ASD), often relying on suboptimal reporting across gross categories (e.g., employed, not employed) or adaptive behavior scales developed for use with children. This research includes first steps to develop an efficient, validated, proxy and self-report measure of functional outcomes for autistic adults– the Adult Functioning Scale (AFS).

Methods: Development of the AFS occurred in three phases. First, preliminary baseline data were collected from 62 autistic adults. Participants completed an adaptive behavior scale validated for children, and field standard measures of functional outcome developed for adults with schizophrenia. The sensitivity of these measures in assessing functional outcomes in autistic adults was evaluated. Next, existing functional outcome measures were identified in the literature and used to inform AFS conceptual model development. Stakeholders reviewed the model, which was further revised, and items were generated. Finally, autistic adults (n = 13) and caregivers of autistic adults (n= 13) completed in-depth cognitive interviews to assess comprehension of items and responses, factors influencing participant responses, and the inclusiveness of the item pool in capturing pertinent concerns.

Results: None of the evaluated measures consistently predicted both social functioning and employment outcomes for autistic adults, suggesting a need for improved measurement in this area. A final conceptual model was generated with 3 subdomains (social functioning, employment, and autonomy). Cognitive interviews indicated that further revision of all subdomains is warranted, given heterogeneity across the adult ASD population.

Conclusion: This study developed the first conceptual model of functional outcomes specific to autistic adults. Future work will involve the collection of data from 1000 self-reporters and their caregivers to conduct psychometric analyses and validate an efficient, precise, and broadly applicable measure of adult functional outcomes in ASD.

Presenter:	Kristie Mak, BSc
Current Position:	Staff
Title:	**Piloting transcranial direct current stimulation of visual cortex to reduce threat sensitivity**
Author(s):	*Mak KM , Edmiston EK[1]*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Individuals with high trait anxiety (HTA) are at elevated risk for developing mood and anxiety disorders. HTA individuals are more likely to perceive threat where there is none, and may perceive both neutral and novel stimuli as threatening. This elevated threat sensitivity could be mediated by elevated activity in a threat perceptual network which includes the amygdala and visual cortices. It is unclear if the visual cortex is a reasonable target for intervention to reduce threat sensitivity in HTA. In this study, we applied transcranial direct current stimulation (tDCS) to the visual cortex, threat detection in the brain may be downregulated. As a result, there will be a shift in the perceptual threshold for threatening stimuli.

Methods: In this double-blinded placebo controlled study, subjects aged 18-30, ranging from low to high trait anxiety as determined by the Spielberger Trait Anxiety Inventory (STAI) completed a threat perception task while undergoing active or sham tDCS targeting the visual cortex. Participants watched a series of videos wherein neutral faces morphed to fearful or happy faces. Participants indicated via button press when they perceived an emotional expression. Button press latency was compared within subjects in the active versus sham condition.

Results: Preliminary data shows an increase in button press latency in the active versus sham tDCS condition. Furthermore, changes in button press latency were greatest in the HTA participants relative to participants with low trait anxiety. This pattern was present for both happy and fearful task conditions.

Conclusion: Cathodal tDCS of the visual cortex may be associated with a shift in the perceptual threshold for threatening or potentially threatening stimuli. By downregulating threat detection in the visual cortex, individuals may be less likely to perceive threat. This could pave the way for a novel treatment intervention for individuals who are at elevated risk for developing anxiety disorders.

Presenter: Elizabeth McGuier, PhD

Current Position: Faculty

Title: Associations between teamwork and implementation outcomes in multidisciplinary cross-sector teams implementing a mental health screening and referral protocol

Author(s): McGuier EA[1] , Aarons GA[2] , Byrne KA[3] , Campbell KA[4] , Keeshin B[4] , Rothenberger SD[5] , Weingart LR[6] , Salas E[7] , Kolko DJ[1]

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Introduction: Teams play a central role in implementation of new practices in settings providing team-based care. However, the implementation science literature has paid little attention to potentially important team effectiveness constructs, such as the affective, behavioral, and cognitive functioning of teams and their members. There has been even less attention to how teamwork and team attributes are related to implementation outcomes. This study tests associations between teamwork and implementation outcomes in a statewide initiative to implement a standardized mental health screening/referral protocol in Child Advocacy Centers (CACs).

Methods: Multidisciplinary team members (N = 433) from 21 CACs completed measures of team interdependence, functioning, and performance and rated the acceptability, appropriateness, and feasibility of the screening/referral protocol. The implementation outcomes of days to adoption and reach were assessed with administrative data. Associations between team constructs and implementation outcomes were tested with linear mixed models and regression analyses.

Results: Team task interdependence was positively associated with implementation climate and reach, but not associated with acceptability, appropriateness, or feasibility. Affective team functioning was associated with greater acceptability, appropriateness, and feasibility. Behavioral and cognitive team functioning were not associated with any implementation outcomes in multivariable models. Team performance was positively associated with acceptability, appropriateness, and feasibility as well as implementation climate; it was not associated with days to adoption or reach.

Conclusion: We found some associations of team interdependence, functioning, and performance with individual- and center-level implementation outcomes. Implementation strategies targeting teamwork, especially task interdependence, affective functioning, and performance, may improve implementation outcomes in team-based service settings.

Presenter:	Kaylynn McKinney, BS
Current Position:	Staff
Title:	**Cortical thickness and subcortical gray matter nolume in substance use disorders**
Author(s):	*McKinney K, Himes ML , Tollefson SA , Narendran R*
Affiliation(s):	*Department of Radiology, University of Pittsburgh*

Introduction: Recent meta-analyses of MRI studies report widespread reductions in cortical and subcortical gray matter volumes (GMV) in substance use disorders patients compared to healthy controls. Neuroreceptor PET imaging studies, typically investigates a relatively small cohort (n= ~ 20/group), have shown no significant differences in MRI-derived cortical and subcortical GMV between substance use disorder and healthy controls. We pooled our lab's historical data of structural brain MRIs to compare cortical thickness and GMV between alcohol use disorder (AUD) patients, cocaine use disorder (CUD) patients, and healthy controls (HC).

Methods: Subjects previously consented and screened (Structured Clinical Interview for DSM-IV or DSM5) as eligible to participate in a CUD or AUD neuroreceptor PET study which an MRI was available were included. Our sample included n= 68 AUD (34.8±10.1, 41 Females), 63 CUD (33.8±10.3, 32F), and 68 HC (33.3±7.8, 41F). Cortical thickness and GMV were derived from FreeSurfer. Cortical regions of interest (ROIs) and subcortical ROIs were examined. GMVs were normalized to each subject's respective FreeSurfer-derived intracranial volume. Two-tailed t-tests were performed to contrast differences between groups. A Bonferroni correction was implemented to correct for multiple hypothesis testing in the regions of interest.

Results: No significant difference between the groups of interest in cortical thickness or subcortical GMV were present after a Bonferroni correction. However, trend-level decreases in some (such as the hippocampus/amygdala), but not all ROIs in AUD Vs. HC that failed to survive a correction for multiple comparisons were present.

Conclusion: We found no significant differences in either cortical thickness or subcortical GMV substance use disorder subjects vs. healthy controls. Possibility that our sample was underpowered to detect the modest but significant differences reported previously. Also a younger (< 45 years) and healthier (no comorbid medical/psychiatric disorders) substance use disorder patient population may have limited our ability to detect differences in these regions.

Presenter: Rachel Miceli, MA

Current Position: Staff

Title: **Behavioral and neuroimaging evidence prodromal to major depressive disorder onset in a young adult without personal or family history of psychiatric disorder: Case report**

Author(s):   *Miceli RR , Satz SA , Swartz HA , Manelis A*

Affiliation(s):   *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Subthreshold symptoms of major depressive disorder (MDD) may be underreported due to stigma and/or cognitive impairment associated with this illness. Identifying objective behavioral and neural markers prodromal to MDD onset would help overcome this bias. This case study reports prospective behavioral and neuroimaging evidence prodromal to MDD onset in a young adult without prior personal or family history of psychiatric disorders.

Methods: The participant completed the SCID-5 and other clinician-administered and self-reported assessments of depression, anxiety, and anhedonia as well as the Vividness of Visual Imagery Questionnaire at baseline, 6-month and 12-month follow-ups. The participant also performed the Emotion Intensity Rating task and was scanned using magnetic resonance imaging (MRI). The cortical myelin maps were calculated based on the T1w/T2w ratio. The participant's behavioral performance on the task and myelin maps were then compared against the those observed in healthy controls and individuals diagnosed with depressive disorders.

Results: The participant presented as a healthy control at baseline and 6-month but met criteria for MDD at the 12-month follow-up based on the SCID-5. The linear discriminant analysis classified the participant as an individual with depressive disorders at both baseline and 6-month follow-up. The participant's visual imagery as well as the ability to correctly recognize neutral faces dramatically reduced from baseline to 6-month follow-up.

Conclusion: The results suggest that the measures of cortical myelin, response to neutral and emotional facial expressions, and vividness of visual imagery were prodromal to illness onset, whereas clinician-administered or self-reported measures of depression symptoms were uninformative.

Presenter: Alyssa Neppach, BS

Current Position: Staff

Title: **Impaired amygdala reactivity to social cues predicts self-reported loneliness**

Author(s):   *Neppach AM[1] , Karim HT[2] , Melhem N[1] , Dombrovski AY[1] , Pecina M[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

[2]Department of Psychiatry and Bioengineering, University of Pittsburgh

Introduction: Loneliness, or the discrepancy between the desired and actual quality and quantity of social relationships, has become an epidemic in recent years. Yet, little is known about the neurobiological underpinnings of loneliness. We proposed that loneliness can be explained by the impaired ability to experience social rewards in the amygdala, a center for the regulation of social behaviors.

Methods: To test this hypothesis 20 unmedicated patients with depression (18-55 years) completed a Contextual Framing fMRI task, which captures effects of valenced contextual cues (pleasant vs. unpleasant) on emotional attribution (the rating of subtle emotional faces: fearful, neutral, or happy). In secondary data analysis, we investigated the neural correlates associated with the processing of pleasant social versus non-social cues, using an amygdala region of interest. Significant blood-oxygen-level-dependent (BOLD) responses within the amygdala were then used to self-reported loneliness (n=10), as measured by the 20-items UCLA Loneliness Scale.

Results: Non-social pleasant contextual cues during the Contextual Framing Task were associated with reduced BOLD responses in the left amygdala compared to social cues.
Reduced amygdala BOLD responses in response to social cues were associated with higher loneliness scores after controlling for depression severity, sex, and age, with (Est.= -64, S.E.=27.7, t = -2.3, p = 0.059, R^2=0.3), the overall model explaining 54% of the variance in the loneliness scale.

Conclusion: Our data suggest that impaired amygdala reactivity to social cues is associated with self-reported loneliness, pointing to amygdala-moderated reward deficits in response to social cues.

Presenter: Amar Ojha, BA

Current Position: Undergraduate or Graduate Student

Title: **Puberty-related maturation of adolescent fronto-striatal resting-state functional connectivity is implicated in the development of inhibitory control**

Author(s):   *Ojha A[1] , Parr AC[2] , Foran W[2] , Calabro FJ[2,3] , Luna B[4]*

Affiliation(s):   *[1]Department of Neuroscience, University of Pittsburgh*

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[3]Department of Bioengineering, University of Pittsburgh
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Introduction: Adolescence is initiated by puberty and represents a neurobiological period characterized by enhanced neuroplasticity that facilitates improvements in cognitive function. Fronto-striatal systems undergo vast reorganization important specialization throughout adolescence, supporting developmental changes in cognition and reward processing . Though several studies have characterized age-related changes across fronto-striatal networks, the extent to which puberty influences maturation of fronto-striatal networks is less known, limiting our understanding of unique adolescent processes.

Methods: Here, we combine two longitudinal datasets to characterize the role of puberty in the development of fronto-striatal resting-state functional connectivity (rsFC), and its relationship to inhibitory control performance.

Results: After controlling for age effects, puberty was associated with rsFC between the dorsolateral prefrontal cortex (dlPFC) and nucleus accumbens (NAcc) in both males and females. Additionally, ventrolateral PFC (vlPFC) - NAcc rsFC was associated with puberty in females. In both cases, quadratic relationships best characterized puberty-related changes, with inflections centered around mid-puberty. Additionally, rsFC was associated with inhibitory control performance at specific pubertal periods. Specifically, in early periods, stronger rsFC was associated with worse inhibitory control performance, and this relationship diminished following mid-puberty.

Conclusion: Taken together, our findings suggest that mid-late puberty is a crucial period for lateral PFC - NAcc circuitry maturation, which may underlie developmental changes in inhibitory control function into adulthood.

Presenter:	Tae Woo Park, MD, MSc
Current Position:	Faculty
Title:	**Trends in adult ADHD diagnosis and treatment in patients with opioid use disorder in the United States**
Author(s):	*Park T[1] , Baul TD[2] , Morgan JR[3] , Wilens TE[4] , Yule AM[2]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychiatry, Boston University School of Medicine
	[3]Health Law, Policy & Management, Boston University School of Public Health
	[4]Department of Psychiatry, Harvard Medical School

Introduction: Little is known about trends in prevalence of attention deficit hyperactivity disorder (ADHD) diagnosis and treatment amongst people with opioid use disorder (OUD) in the United States. We aimed to assess the nationwide prevalence and trends in ADHD diagnoses and treatment among people with OUD and ADHD and examine predictors of concurrent stimulant and medications for OUD (MOUD) receipt.

Methods: We used a claims-based database of commercially-insured people aged 18-64 in the U.S. to identify 387,980 patients diagnosed with OUD between 2007-2017. ADHD patients had = 2 previous claims with an ADHD diagnosis. We tested the association between demographic characteristics and mental health diagnoses and receipt of a concurrent stimulant using multivariable regression.

Results: From 2007-2017, ADHD diagnosis in patients with OUD increased from 5 to 15% and ADHD treatment increased from 43 to 52% among patients with ADHD and OUD. Of the 173,262 MOUD patients, 11% received = 1 concurrent stimulant prescription during the study period. Concurrent stimulant receipt was associated with younger age, male sex, and geographic region. ADHD, psychotic, mood, and anxiety disorders were associated with increased likelihood of concurrent stimulant receipt. Substance use disorders were associated with a decreased likelihood of concurrent stimulant receipt.

Conclusion: ADHD diagnosis and treatment in patients with OUD has increased over time. Although concurrent treatment with stimulants and MOUD tripled during the study period, only a minority of those with ADHD on MOUD treatment received a stimulant prescription. Further study of the benefits and risks of ADHD treatment in patients with OUD is needed.

Presenter:	Ashley Parr, PhD
Current Position:	Postdoc Associate
Title:	**Variation in striatal dopamine-related neurophysiology supports age-related changes in glutamate through human adolescence**
Author(s):	*Parr AC[1] , Perica MI[2] , Calabro F[3] , Tervo-Clemmens B[4] , Foran W[1] , Yushmanov V[5] , Hetherington H[6] , Luna B[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychology, University of Pittsburgh
	[3]Department of Psychiatry, Department of Bioengineering, University of Pittsburgh
	[4]Department of Psychiatry, Massachusetts General Hospital, Harvard Medical School
	[5]Department of Radiology, University of Pittsburgh
	[6]Department of Radiology, University of Missouri Columbia

Introduction: Recent research from our lab has identified changes in prefrontal cortex (PFC) glutamate (Glu), gamma-aminobutyric acid (GABA), and GABA/Glu balance in adolescence (Perica et al., Flux 2021/22), potentially reflecting critical period plasticity that supports developmental specialization of PFC-dependent cognitive function. The mechanisms mediating the engagement of this process remain unknown. Emerging evidence implicates dopamine (DA) in regulating changes in E/I through adolescence (Reynolds & Flores, 2021); here, we assess the role of DA in supporting changes in PFC Glu and GABA from adolescence to adulthood.

Methods: Indices of Glu and GABA were obtained in 143 10-30 year olds (73F) using 7T Magnetic Resonance Spectroscopic imaging (MRSI). An oblique MRSI slice of 24x24 voxels (1.0x0.9x0.9mm) using a J-refocused spectroscopic imaging sequence (TE/TR=35/1500ms) facilitated data collection across multiple cortical regions. MR-based indices of striatal tissue-iron (time-averaged and normalized T2*; nT2*) provided an indirect measure of DA-related striatal neurophysiology.

Results: Increased striatal nT2* was associated with higher Glu in anterior cingulate cortex (β=-.17, p=.04), medial PFC (β=-.21, p=.02), and anterior insula (Ins; β=-.23, p=.005). In dorsolateral PFC (DLPFC) and Ins, we observed nT2* by age interactions on Glu (DLPFC: β =-.29, p=.007, Ins: β =-.22, p=.02), and follow-up tests revealed that age-related decreases in Glu were driven by individuals with high levels of nT2* (DLPFC: β=.36, p=.004, Ins: β=.32, p=.005) relative to low (DLPFC: β =-.13, p=.33, Ins: β=.22, p=.07).

Conclusion: This study provides in vivo evidence linking DA processes to age-related changes in PFC GABA/Glu. Models applied at future timepoints will identify longitudinal associations between DA and shifts in GABA/Glu. Understanding developmental mechanisms underlying regulation of E/I transmission can inform the emergence of psychopathologies, such as schizophrenia, that involve changes in DA, Glu, and GABA.

Presenter: Kaitlyn Petersen, BS

Current Position: Undergraduate or Graduate Student

Title: **Comparison of rhythms across the human and mouse striatum**

Author(s): Petersen KA[1], Ketchesin KD[1], Zong W[2], Depoy LM[1], Seney ML[1], Cahill KM[2], Glausier JR[1], Lewis DA[1], Tseng GC[2], McClung CA[1]

Affiliation(s): [1]Department of Psychiatry, University of Pittsburgh School of Medicine

[2]Department of Biostatistics, University of Pittsburgh

Introduction: The human striatum can be subdivided into the caudate, putamen, and nucleus accumbens (NAc). In mice, this corresponds to the dorsal medial striatum, dorsal lateral striatum, and ventral striatum (NAc). Each of these structures have some overlapping and some distinct functions related to motor control, cognitive processing, motivation, and reward. Importantly, alterations in these regions have been shown to be associated with psychiatric disorders such as schizophrenia and obsessive-compulsive disorder.

Methods: Previously, we used a "time-of-death" approach to identify diurnal rhythms in RNA transcripts in the human striatal subregions collected from postmortem human brain tissue in subjects without psychiatric or neurological disorders. Here, we identify and compare molecular rhythms across the three striatal subregions collected from C57BL/6J mice across 6 times of day and compare results to our human striatal data.

Results: In humans, core circadian clock genes are rhythmic across all three regions and show strong phase concordance across regions. Furthermore, there are striking distinctions in rhythmic pathways between the three regions. In mice, we found various similarities and differences in regard to rhythmic pathways and phase timing between regions as well as region differences when comparing mouse to human data.

Conclusion: Taken together, these studies reveal distinct transcriptome rhythms across the human and mouse striatum and are an important step in helping to understand the normal function of diurnal rhythms in humans and model organisms in these regions and how disruption could lead to pathology. In the future, this information will be utilized to perform more targeted analyses related to mood and substance use disorders.

Presenter: Pranjali Rajalakshmi, BS

Current Position: Undergraduate or Graduate Student

Title: **Mu-opioid blockade blunts neural responses to pleasant contextual cues through decoupling of prefrontal and anterior insula connectivity**

Author(s): *Rajalakshmi P , Kukor C , Helmet K , Dombrovski AY , Pecina M*

Affiliation(s): *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Context can significantly alter the meaning of events. We recently demonstrated that the mu-opioid antagonist naltrexone blunts prefrontal neural responses during the processing of contextual cues in patients with depression. We hypothesized that these effects are due to prefrontal opioidergic effects on salience attribution.

Methods: To test this hypothesis, twenty unmedicated patients with depression completed a randomized, double-blind, placebo-controlled, crossover study of one dose of 50 mg of naltrexone, or placebo immediately before two sessions of the Contextual Framing fMRI task. This task captures effects of valenced contextual cues (pleasant vs. unpleasant) on emotional attribution (the rating of subtle emotional faces: fearful, neutral, or happy). In secondary analysis, we investigated connectivity differences between task conditions using psychophysiological interaction between naltrexone-induced changes in the prefrontal cortex (seed) and the salience network (https://neurosynth.org).

Results: Prefrontal functional connectivity did not differ significantly during the processing of contextual cues (pleasant or unpleasant) or subtle emotional faces (fearful, neutral, or happy). However, the administration of one single dose of naltrexone was associated with decoupling of functional connectivity between the prefrontal cortex and the anterior insula during contextual processing (pleasant>unpleasant, TFCE (1- P > 0.95)). No effects were observed for the opposite contrast (Naltrexone>Placebo), or during the processing of emotional cues.

Conclusion: These results suggest that opioidergic blockade alters contextual processing by decoupling prefrontal to anterior insula functional connectivity during the processing of contextual cues, possibly disengaging salience attribution. These results give further insights into the mechanisms through which naltrexone affects drug cue salience in substance use disorders.

Presenter:	Emma Riley, BS
Current Position:	Staff
Title:	Linguistic analysis of positive autobiographical memories recalled by individuals with major depressive disorder during real-time fMRI neurofeedback training
Author(s):	*Riley E , Barb S , Lazzaro S , Canovali G , Young K*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Real-time fMRI amygdala neurofeedback training (rtfMRI) is a new intervention that shows potential for reducing depressive symptoms. During this intervention participants use positive autobiographical memories to increase their amygdala response. Linguistic analyses of the positive autobiographical memories recalled by individuals with MDD may provide insight on the effects of language when using this type of intervention.

Methods: Participants included 38 individuals who met criteria for MDD according to clinician administered SCID-V. We examined text collected via survey of positive autobiographical memories used during rtfMRI training, then analyzed using Linguistic Inquiry and Word Count (LIWC). Memories were reported after their first neurofeedback training session. Differences in initial and post-first intervention Beck Depression Inventory-II (BDI-II) scores were calculated, and group comparisons of the linguistic characteristics were made between those who showed in increase (worsening) and decrease (improvement) in depressive symptoms following the first neurofeedback training visit.

Results: Individuals whose BDI-II scores decreased from initial baseline to following the first rtfMRI intervention (N=25, M=1.99, SD=2.88) were significantly more likely to use emotion positive words (good, love, happy, hope) when compared to those whose BDI-II scores increased (t(36)=-1.70, p=0.004). Individuals whose BDI-II scores increased (N=13, M=0.54, SD=1.56) were significantly more likely to describe their memories with culture words (govern, United States, phone, car) when compared to those whose BDI-II scores decreased (t(36)=1.5, p=0.004).

Conclusion: Individuals diagnosed with MDD who have an improvement in BDI-II scores after amygdala rtfMRI neurofeedback training used more emotion positive words when recalling their autobiographical memories. Those whose BDI-II increased following amygdala rtfMRI neurofeedback training were more likely to use culture words. These findings suggest potential strategies/guidance that can be provided to patients participating in amygdala neurofeedback during positive autobiographical memory recall.

Presenter:	Andrés Román-Jarrín, MD
Current Position:	Resident
Title:	**De novo onset substance use disorder among high-risk teenagers and young adults: A longitudinal study**
Author(s):	*Román-Jarrín A , Merranko J , Monk K , Liao F , Hafeman D , Birmaher B*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: There are no prospective studies examining risk factors associated with new onset SUD among offspring of bipolar parents (OPB). Here we evaluated the prevalence of new onset SUD and the factors ascertained at intake associated with increased risk for new onset SUD in OPB compared with offspring of control parents.

Methods: Twenty-three offspring with SUD at intake [16 OPB (70%), 6 offspring of parents with non-BD psychopathology (26%), and 1 offspring of healthy control parents (4%)] and 822 offspring without SUD at intake [484 OPB (59%), 195 offspring of parents with non-BD psychopathology (24%), and 142 offspring of healthy controls (17%)] were included. The mean ages at intake and at follow-up were 10.6 ± 3.6 and 21.5 ± 6.5, respectively. Demographic, clinical, and family history variables were assessed over a median of 12.5 years using the Longitudinal Interval Follow-up Evaluation, Kiddie Schedule for Affective Disorders and Schizophrenia, and the Structured Clinical Interview for DSM-IV. Risk factors were analyzed using a least absolute shrinkage and selection operator.

Results: Twenty-three percent (190/822) of offspring reported new onset SUD during follow-up for an overall SUD prevalence (intake and follow-up) of 25%. The median age of SUD onset was 32.0 years old. Predictors ascertained at intake of new onset SUD included: male sex (HR=1.09), parental history of SUD (HR=1.04), exposure to substances before age 16 (HR=2.20), ADHD (HR=1.15), and conduct disorder (HR=2.04). Living with both biological parents lowered the risk of SUD (HR=0.80).

Conclusion: SUD in OPB is prevalent. Identifying risk factors, especially those amenable for modification (e.g., early exposure to substances, ADHD) are important to prevent the onset of SUD in OPB. Future analyses of our data will also include variables ascertained during the follow-up that may increase the risk of new onset SUD.

Presenter: Renata Rozovsky, PhD

Current Position: Postdoc Associate

Title: **Neurological commonalities and differences in emotional dysregulation across three clinical scales in young adults seeking help for distress**

Author(s):   *Rozovsky R , Bertocci M , Stiffler RS , Bonar LK , Bebko G , Aslam H , Phillips ML*

Affiliation(s):   *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Emotional dysregulation is a key component in psychiatric disorders and often is an early manifestation of future diagnosis. Identification of neural markers of current and future emotional dysregulation is an important goal in clinical research.

Methods: Whole brain multimodal analysis of gray matter(GM) and activity/functional connectivity(FC) during a face emotion processing paradigm was performed; regularized regression followed by multiple regression identified relationships between neural variables and clinician rated measures of mania(YMRS), depression(HRSD), and anxiety(HAMA) severity at baseline and longitudinally (up to 24-months post-scan) in 221 participants (157 females, Age(21.6±2).

Results: Analyses revealed positive relationships between baseline depression and activity in right fusiform (B=1.49,p=0.001), left amygdala (B=1.66,p=0.001); amygdala-right dACC FC(B=1.51,p=0.009); thickness in left pars opercularis (B=5.11,p=0.002), and negative relationships with left inferior temporal thickness (B=-6.50,p=0.001) and left pars orbitalis thickness (B=-3.15,p=0.007). Baseline anxiety was positively related with activity in right fusiform (B=1.31,p=0.001) and left amygdala (B=1.54,p=0.003), and thickness in left pars opercularis (B=5.73,p=0.001), left isthmus cingulate (B=3.44,p=0.005), and negatively related with thickness in left inferior temporal (B=-7.40,p=0.001) and left pars orbitalis (B=-3.02,p=0.010). Baseline mania was positively related with left pars opercularis (B=8.78,p=0.001) and negatively with left inferior temporal thickness (B=-5.47,p=0.002), and positively related with right superior frontal area (B=71.22,p=0.009) and negatively with left precentral area (B=-3.04,p=0.019). Follow-up data showed right fusiform positively predicted future anxiety (B=1.57,p=0.006) and amygdala-right ventrolateral prefrontal cortex(vlPFC) FC positively predicted future mania (B=1.07,p=0.008).

Conclusion: Findings show converging patterns of emotion processing activity and cortical thickness/area in regions supporting salience and visual perception, related to emotion dysregulation symptoms at baseline. Only functional measures in visual and face emotion processing circuitries predicted future symptom severity. Findings may contribute to early diagnosis and novel treatment development.

Presenter: Shelby Ruiz, BS

Current Position: Undergraduate or Graduate Student

Title: **The synaptic proteome of Autism Spectrum Disorder throughout development**

Author(s):   *Ruiz SR , Xu K , Salisbury RB , MacDonald ML*

Affiliation(s):   *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Autism Spectrum Disorders (ASDs) are a collection of developmental syndromes characterized by a variety of sensory and behavioral alterations. Despite the diversity of symptoms and severity, a common pathologic feature observed in genetic ASD models and subject tissue is a decrease in mature spines. Spine maturation and stabilization are modulated by synaptic protein machinery. Unbiased genetic studies have identified rare variants and common loci that implicate synaptic protein networks in ASD. Transcriptomic studies of cortical regions in ASD have observed altered synaptic gene expression. Here, in a preliminary study, we measured synaptic protein levels and phosphorylation in visual cortex tissue from adult ASD subjects to determine if differences in the synaptic proteome and phosphoproteome could be detected in adult tissue.

Methods: Postmortem visual cortex tissue from 10 pairs of ASD and control subjects (ages 20-30) matched for age, sex, and postmortem interval, were obtained. Homogenate, synaptosome enrichments, and phosphopeptides were analyzed on an Orbitrap Eclipse Tribrid Mass Spectrometer. Peptide and protein identification and quantification were done in Proteome Discoverer 2.5.

Results: Over 4,000 proteins and 7,500 phosphopeptides were quantified across all homogenate and synaptosome preparations. The number of nominally significantly different proteins and phosphopeptides found in each fraction are as follows. Homogenate: 116 proteins and 145 phosphopeptides (on 125 unique proteins). Synaptosome: 78 proteins and 170 phosphopeptides (on 139 unique proteins). Of the nominally significant synaptic phosphopeptides, 7 were on proteins coded for by genes strongly implicated in ASD [(SAFARI score = 3), NR1D1, PAFAH1B2, ITSN1, SYNE1, MARK1, DLGAP2, SATB2].

Conclusion: Numerous synaptic proteins and neurotransmitter receptors were found to be differentially expressed in ASD versus neurotypical control tissue. Future investigations will characterize the synaptic proteome and phosphoproteome of ASD subjects throughout development.

Presenter: Ryan Salisbury, BS

Current Position: Staff

Title: **Effects of decrease in ATP1A3 on the synaptic proteome**

Author(s):   *Salisbury RB , Xu K , Newman J , Garver M , Sweet RA , MacDonald ML*

Affiliation(s):   *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Schizophrenia (Sz) is characterized by paranoia, auditory hallucinations, and incoherent speech, but the cause is unknown. Our group showed ~10% decrease in cellular and synaptic levels of ATP1A3 in the auditory cortex of patients with Sz. ATP1A3 mutations are linked to auditory hallucinations. We sought to determine the effects of decreased ATP1A3 expression on the synaptic proteome and dendritic spine length and density in mice.

Methods: ATP1A3 +/- mice and wild type littermate controls were bred (n = 20/group, 10M/10F) and sacrificed in adulthood. Auditory cortices were micro dissected from the right hemisphere. Tissue homogenates and synaptosome enrichments were prepared with SynPER kit (Thermo Fisher). 10 µg of total protein was digested, labeled with TMT, and read on the Orbitrap Eclipse. Using immunohistochemistry and microscopy techniques, dendritic spine length and density were assessed in the left hemispheres from the same animals (n=10/group).

Results: 61,569 peptides corresponding to 5,019 proteins were quantified. 178 out of 5032 (3.55%, $p < 0.05$) proteins and differentially correlated peptides were significantly altered in the ATP1A3 +/- mice. ATP1A3 was significantly downregulated in heterozygous vs. control mice ($p < 0.05$ and $q < 0.05$). ATP1B1 was downregulated, whereas ATP1A1 was significantly upregulated ($p < 0.05$ and $q < 0.05$). Auditory cortex layer 3 spine density was not decreased in ATP1A3 +/- mice.

Conclusion: We did not observe a significant correlation between synaptic ATP1A3 levels and dendritic spine density in auditory cortex tissue from human subjects. However, spine density was slightly increased in the ATP1A3 +/- mice, suggesting decreased ATP1A3 drives Sz symptoms through another mechanism other than decreased spine density. Using new R packages, we removed differentially correlated peptides across treatment groups, while repackaging the data for WGCNA analysis. This dataset allowed us to introduce our new statistics pipeline for analyzing case-control mass spectrometry studies

Presenter: Samantha Saloom, BS

Current Position: Medical Student

Title: **Young pregnant women's perspectives on decisions to disclose marijuana use to their obstetric providers**

Author(s): *Saloom SL[1] , Boss N[2] , Chang JC[3] , Hossain F[2] , Richardson GA[2], De Genna NM[2]*

Affiliation(s): *[1]Department of Medicine, University of Pittsburgh School of Medicine*

[2]Department of Psychiatry, University of Pittsburgh School of Medicine
[3]Department of Obstetrics, Gynecology and Reproductive Sciences, University of Pittsburgh School of Medicine

Introduction: While prenatal marijuana use has increased over the last two decades, particularly among young women, evidence indicates that marijuana use during pregnancy is associated with adverse outcomes. Research has found that many pregnant women do not disclose marijuana use, and clinicians feel unconfident about how to respond to disclosure. These factors contribute to the need for a greater understanding of young pregnant women's perspectives and considerations in disclosing marijuana use to their providers.

Methods: We conducted audio recorded semi-structured qualitative interviews assessing young women's considerations in their decision to disclose marijuana use to their obstetric providers during pregnancy. Participants were recruited for the qualitative interviews after enrolling in the YoungMoms Study, a mixed-methods cohort study consisting of pregnant women ages 13-21. Interview transcripts were coded by two independent coders using NVivo software and reviewed to identify central themes.

Results: Of the 13 completed interviews, the mean age of participants is 20 (range: 17-21) and 38% used marijuana during the prenatal period. Most (77%) of participants identified as Black, 15% identified as biracial, and 8% as white. The main themes that emerged were fear of judgement from obstetric providers and child protective services' involvement. Participants also viewed provider apathy as a deterrent to disclosure. Some participants believe obstetric providers are a valuable source of information about a safe pregnancy and felt that rapport and trust were important for disclosure, while others described disclosing because they believed their providers would inevitably discover their marijuana use. When asked to give advice to providers concerning disclosure conversations, participants emphasized that providers should show interest in patient wellbeing, value patients' stories, set expectations, and be nonjudgmental after disclosure.

Conclusion: When discussing marijuana use, obstetric providers should practice patient centered care and focus counseling on health effects rather than imposing judgement or reinforcing fears of child protective services' involvement.

Presenter: Skye Satz, BS

Current Position: Staff

Title: **The ability to resolve cognitive and perceptual interference is affected by age and lifetime spectrum mood symptoms**

Author(s): Satz SA[1], Schwalbe ME[2], Miceli RR[1], Manelis A[1]

Affiliation(s): [1]Department of Psychiatry, University of Pittsburgh School of Medicine

[2]School of Medicine, University of Pittsburgh

Introduction: Executive function, including interference resolution, declines with normal aging and is impaired in individuals with mood disorders. This impairment may be present even in the euthymic state, yet little is known about the effects of spectrum depressive and hypo/manic symptoms on one's ability to resolve cognitive and perceptual interference. This study examines how aging and spectrum mood symptoms are related to interference resolution across the lifespan.

Methods: Seventy-one participants (ages 18-85, 39 female) completed a modified version of the Simon task in which participants are presented with right- and left-pointing arrows, located to the right or left of the screen, and are asked to indicate which direction the arrow points. In the congruent trials, the arrow location and direction matched, while in the incongruent trials, they mismatched (cognitive interference). In 50% of the trials, the arrow was accompanied by an unrelated sound (perceptual interference). Participants also completed the Mood Spectrum questionnaire (MOODS-SR), a self-report measure of lifetime mood symptomatology. Linear mixed models were used to examine the relationship of age and spectrum mood symptoms on cognitive and perceptual interference resolution.

Results: The interaction between age, stimulus congruency, and spectrum hypo/mania scores as well as between age, presence of sound, and spectrum depression scores significantly affected RT ($p<0.001$). Specifically, older adults with higher spectrum mania responded slower on trials with cognitive interference (incongruent stimuli) while older adults with higher spectrum depression scores responded more slowly on trials with perceptual interference (auditory stimuli) than their younger and/or unaffected counterparts.

Conclusion: Successful performance on the modified Simon task requires resolution of both cognitive and perceptual interference based on stimulus congruency and presence of sound, respectively. This interference resolution in older adults is sensitive to spectrum mood symptomatology. Future research should investigate the specific mechanisms underlying cognitive vs perceptual interference in these individuals.

Presenter: Kirsten Schoonover, PhD

Current Position: Postdoc Associate

Title: **Altered excitatory and inhibitory ionotropic postsynaptic receptor subunit expression in the cortical visuospatial working memory network in schizophrenia**

Author(s):   *Schoonover KE , Dienel SJ , Bazmi HH , Lewis DA*

Affiliation(s):   *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Introduction: Working memory dysfunction in individuals with schizophrenia is thought to reflect altered excitatory and inhibitory neurotransmission across multiple nodes of the cortical visuospatial working memory (vsWM) network. However, analyses of key ionotropic glutamatergic and GABAergic receptor subunits have been limited to one node, the dorsolateral prefrontal cortex (DLPFC).

Methods: Methods: Using qPCR on total gray matter homogenate samples from the dorsolateral prefrontal cortex (DLPFC), posterior parietal cortex (PPC), and the primary (V1) and association (V2) visual cortices, we quantified transcript levels of critical subunits for excitatory N-methyl-D-aspartate receptors (NMDARs), excitatory alpha-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid receptors (AMPARs), and inhibitory GABAA receptors (GABARAs) in 20 matched pairs of schizophrenia (SZ) and unaffected comparison (UC) subjects.

Results: Results: In UC subjects, AMPAR and NMDAR levels generally exhibited opposite rostral-to-caudal gradients, with AMPAR GRIA1 and GRIA2 expression highest in DLPFC and NMDAR GRIN1 and GRIN2A expression highest in V1; however, the regional pattern of NMDAR GRIN2B expression was similar to that of AMPARs. GABARA5 and GABARA1 levels were highest in DLPFC and V1, respectively. In SZ subjects, all receptor subunits were downregulated across all regions, except for GRIN2B and GABARA5 in DLPFC.

Conclusion: Conclusions: In UC subjects, these receptor subunit-specific gradients across the vsWM network suggest regional differences in the precise contributions of excitatory and inhibitory signaling necessary for vsWM processes. In SZ subjects, these data provide evidence that both excitation and inhibition are downregulated across the vsWM network, suggesting the vsWM dysfunction in the illness reflects the cumulative effects of synaptic dysfunction in multiple cortical regions.

Presenter:	Maya Schumer, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Trait urgency mediates associations between neural emotion-processing markers of emotion-triggered impulsivity and mania in young adults at-risk for bipolar disorder**
Author(s):	*Schumer MC[1] , Bertocci MA[1] , Bebko G[1] , Stiffler RS[1] , Aslam HA[1] , Graur S[1] , Edmistion EK[1] , Chase HW[1] , Johnson SL[2] , Phillips ML[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychology, University of California, Berkeley

Introduction: Negative and positive urgency (NU/PU), impulsive response tendencies to negative or positive affect, respectively, are transdiagnostic risk factors for BD. The present study assessed relationships between urgency-related neural activity during implicit facial emotion-processing and hypo/mania.

Methods: A transdiagnostic cohort n=109 adults, age=21.59±2.09, 69.72% female, was scanned by functional MRI (fMRI) while viewing angry and happy faces. Urgency and current hypo/mania were measured by the UPPS-P and Moods Spectrum mania domain, respectively. Face-related activity was examined using anatomical regions-of-interest involved in emotion-processing and data-driven regions derived from our recent meta-analysis of BD fMRI studies. Parameter estimates were extracted from separate multiple regression models of NU and PU covarying for age and gender p<.001, uncorrected, k=20. Post-hoc tests for mediation effects of urgency on relationships between neural activity and hypo/mania were conducted (all p's FDR-corrected).

Results: Increasing NU correlated with right insular, bilateral dorsal striatal (DS), and left dorsolateral prefrontal (DLPFC) hypoactivation and fully mediated the negative relationships between right DS, left DS, and DLPFC activity and hypo/mania (c p=.002, .002, .019, c' p=.261, .126, .813, respectively). Increasing PU correlated with right DS and right insular hypoactivation and fully mediated the negative relationships between DS and insular activity and hypo/mania (c p=.002, .037, c' p=.062, .571, respectively).

Conclusion: We identified indirect pathways linking greater levels of urgency-related hypoactivity in executive function, sensorimotor, and salience networks with greater hypo/mania, via positive relationships with impulsivity. These objective biomarkers of high urgency can guide new treatment developments for vulnerable young adults with high levels of this BD-risk factor.

Presenter: Noah Schweitzer, BS

Current Position: Undergraduate or Graduate Student

Title: **Sex differences in vascular reactivity of APP/PS1 mouse model of Alzheimer's disease**

Author(s): *Schweitzer N[1] , Cover C[1] , Wu M[2] , Aizenstein H[2] , Vazquez A[3] , Iordanova B[1]*

Affiliation(s): *[1]Department of Bioengineering, University of Pittsburgh*

[2]Department of Psychiatry, University of Pittsburgh School of Medicine

[3]Department of Radiology, University of Pittsburgh School of Medicine

Introduction: Approximately two-thirds of the people diagnosed with Alzheimer's Disease (AD) are women. The pathways, severity and presentation of vascular contributions to cognitive impairment and dementia appear to be sex-specific. Understanding those sex differences will lead to more accurate diagnostics and better treatment of AD. We quantified the longitudinal changes in neurovascular coupling and vascular reactivity in male and female wild-type (WT) and AD mice. We aim to correlate these measures with amyloid plaques and cerebral amyloid angiopathy (CAA) deposition.

Methods: We injected AAV-Syn-GCaMP6f into transgenic AD mice (B6C3.Tg.APPswe-PSEN1de9, n=5 male, n=5 female, 3-16 months, and age-matched controls). We followed the longitudinal trajectory of neurovascular responses in the somatosensory cortex through whisker stimulation. In a separate experiment, we decoupled the vascular from the neuronal response by inducing hypercapnia with 10% CO_2. Dual-wavelength wide-field optical imaging simultaneously recorded hemodynamic and neuronal responses. Amyloid plaques and CAA were labelled in vivo with Methoxy-04.

Results: Data collection is currently ongoing as the females age and we quantify the CAA and plaque deposits. At present, we observe sex-differences in the longitudinal trajectories of vascular reactivity to hypercapnia in AD mice. Young AD females have a larger response to hypercapnia compared to males, but with aging, their vascular response diminishes quicker. The vascular response in elder AD vs. WT mice (>10 months) is also significantly decreased. In contrast, we did not observe differences in functional response to whisker stimulation, which is expected as there are no significant somatosensory impairments in AD.

Conclusion: Preliminary results display sex differences in the longitudinal trajectories of vascular reactivity in an AD mouse model.

Presenter: AnnaMaria Segreti, BS

Current Position: Staff

Title: **Peer support partners within high fidelity wraparound in Pennsylvania**

Author(s): *Segreti, AM[1,2], Danny, AD[1,2], Owens, C[1,2], Payne, MW[1,2], Jones, L[1,2], Nash, K[1,2]*

Affiliation(s): *[1] Department of Psychiatry, University of Pittsburgh School of Medicine*

[2] Youth and Family Training Institute

Introduction: The University of Pittsburgh's Youth and Family Training Institute (YFTI) provides the training, coaching, credentialing, fidelity, and outcomes monitoring for 17 of the most populated counties in Pennsylvania for the High Fidelity Wraparound (HFW) process. HFW is a team-based, collaborative process for developing and implementing individualized plans for youth with complex behavioral health and/or other challenges, and their families. Family and Youth Support Partners (FSPs and YSPs) are two of the roles in the HFW workforce that are critical to engaging and supporting youth and families.

Methods: In 2020 and 2021, YFTI collected self-reported survey data from 33 FSPs and 38 YSPs working in HFW across Pennsylvania regarding their role in the workforce and how it impacts their lives.

Results: Survey data showed the personal skills that have helped both FSPs and YSPs succeed in their roles include determination, independence, empathy, and self-reliance. Their most frequently performed skills include providing support for the family and youth, identifying new strengths and areas of need, creating goals, and celebrating successes. Ninety five percent of FSPs and 80% of YSPs reported having the necessary skills to perform their jobs well. However, Peer Support can sometimes be difficult, which was reflected by 85% of FSPs and 81% of YSPs reporting emotional challenges with their role. FSPs and YSPs also stressed the importance of practicing self-care, maintaining a healthy work-life balance, and setting boundaries with youth and families. Fifty percent of FSPs and 56% of YSPs reported practicing their self-care daily to a few times a week, and 80% of FSPs and 70% of YSPs reported maintaining a healthy work-life balance.

Conclusion: Survey results helped to provide us with a better understanding of the strengths and challenges of working as a Peer Support Partner within HFW. Individual growth, success stories, achievements, and suggestions for improvement were discovered. Overall, Peer Support Partners are a crucial element to the HFW team by supporting youth and families who are among the hardest to reach and result in the highest cost to the child-serving systems.

Presenter:	Andrew Seidman, PhD
Current Position:	Postdoc Scholar
Title:	**Racial identity as a moderator of daily life discrimination experiences on mood and alcohol craving among Black adults**
Author(s):	*Seidman AJ , Wilson TK , Pedersen SL*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Racial discrimination among Black Americans is a notable public health concern. According to the Multidimensional Model of Racial Identity, perceptions of public regard (beliefs regarding how others view Black individuals) and private regard (personal attitudes about identifying as Black) can offer protection against adverse consequences of discrimination. However, this has not been tested in daily life. The present study examined associations between daily discrimination and acute negative affect, anxiety, and craving for alcohol and the possible buffering effects of public and private regard.

Methods: Participants were 39 adults who self-identified as Black/African American (MAge = 24.79 years, SD=3.1) who completed a 17-day ecological momentary assessment (EMA) protocol. As part of a larger study, participants were required to drink alcohol at least weekly; for these analyses, they had to report >1 discrimination experience attributable to race or skin color during the EMA. At baseline, participants completed measures of public and private regard. Throughout the EMA, participants received 4 daily prompts and completed a modified version of the Everyday Discrimination Scale, and momentary measures of negative affect, anxiety, and alcohol craving.

Results: Cross-lagged multi-level models found that experiencing heightened discrimination predicted increased negative affect at the subsequent prompt among participants who endorsed low (but not high) public regard (B = 0.06, p = .03). The opposite was found at the between person level: discrimination experiences across the EMA were more strongly associated with alcohol craving for participants with high levels of public regard (B = 0.43, p = .01); its effects were attenuated at lower levels (B = -0.55, p = .03).

Conclusion: Higher perceived public regard may acutely buffer against the deleterious effects that discrimination may have on mood. However, contrary to hypothesis, public regard may exacerbate discrimination's effect on alcohol craving. Additional analyses examining multiple domains of discrimination in larger samples are needed.

Presenter: Tanya Shah, BA

Current Position: Staff

Title: **Longitudinal associations between antagonism, interpersonal problems and childhood maltreatment in borderline personality disorder**

Author(s): *Shah TV , Allen TA , Dombrovski AY*

Affiliation(s): *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Trait antagonism, which reflects an inability to effectively navigate social dynamics, and childhood adversity, are both risk factors for the development of Borderline Personality Disorder (BPD). However, little is known about how these variables interact longitudinally. The present study examines: 1) how changes in antagonism and its facets influence specific types of interpersonal problems; 2) whether within-person dynamics between antagonism and interpersonal problems are moderated by childhood maltreatment.

Methods: Participants (n = 355, Mean age = 46.98, 76.42% Female) were adults diagnosed with BPD who completed an assessment of childhood maltreatment at baseline, and measures of antagonism and interpersonal problems at semi-annual follow-up visits. Multilevel structural equation modeling was used to examine within-person associations between antagonism and two of its facets (distrust and callousness) and specific interpersonal experiences (conflict and shame), as well as whether these effects were moderated by childhood maltreatment.

Results: Within-person changes in antagonism were positively associated with experiences of shame ($? = .21$, $p < .001$) and conflict ($? = .12$, $p = .002$), but neither effect was moderated by maltreatment. Likewise at the facet-level, changes in distrust were positively associated with experiences of shame ($? = .16$, $p < .001$) and conflict ($? = .20$, $p < .001$). Participants with a history of abuse experienced a stronger within-person coupling between distrust and interpersonal conflict ($? = .23$, $p = .02$). Finally, within-person changes in callousness were negatively associated with conflict, but only in participants with a history of maltreatment.

Conclusion: Higher levels of antagonism and its facet distrust predicted greater interpersonal problems at the within-person level. The association between distrust and conflict was strengthened in participants with a history of childhood abuse. These findings help us better predict how childhood trauma and maladaptive personality traits dynamically shape the interpersonal experiences of individuals with BPD.

Presenter:	Micah Shelton, MA
Current Position:	Staff
Title:	**Genetic sex mediates stress susceptibility in adult mice**
Author(s):	*Shelton MA[1] , Barko KN[1] , Riskus SE[1] , Xue X[2] , Seney ML[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Biostatistics, University of Pittsburgh

Introduction: Women are approximately two times as likely to be diagnosed with major depressive disorder (MDD) as compared to men. Previously, we demonstrated that female mice were susceptible to subchronic variable stress (SCVS), while males were resilient. While these sex differences might be driven by circulating gonadal hormones, developmental gonadal and/or genetic sex might play a role.

Methods: To differentiate between gonadal sex (ovaries vs. testes) and sex chromosome effects (XX vs. XY), we utilized the Four Core Genotypes mice. In this transgenic model, the SRY gene (the gonad determining sequence) is placed on an autosome thus uncoupling genetic and gonadal sex. Mice were subjected to SCVS followed by assays of anxiety and depressive-like behaviors. We then performed RNA-seq on tissue isolated from the prefrontal cortex (PFC) and nucleus accumbens (NAc).

Results: Regardless of gonads, XX mice were stress susceptible, while XY mice were stress resilient, which suggests sex differences in stress susceptibility are hormone independent. In the PFC, we found that SCVS exposure resulted in 338 DE transcripts females and 144 DE transcripts in males, with only 21 transcripts affected by stress in both. In the NAc, SCVS resulted in 305 DE transcripts in females and 651 DE transcripts in males, with an overlap of only 29 transcripts altered by stress in both sexes. Not only were the DE transcripts sex-specific, but the representative pathways for the DE transcripts in both regions were also distinct in males and females.

Conclusion: Female susceptibility to SCVS is driven by genetic sex and is independent of circulating gonadal hormones. Consistent with human findings in MDD, there is very little overlap in the genes or pathways that were altered by stress in males and females. Since males are resilient to SCVS, the active transcriptional alterations may promote resilience in males.

Presenter:	Shreya Sheth, BA, MA
Current Position:	Staff
Title:	**The hierarchical structure and predictive validity of antagonism in borderline personality disorder**
Author(s):	*Sheth S , Allen TA , Dombrovski AY*
Affiliation(s):	*Department of fPsychiatry, University of Pittsburgh School of Medicine*

Introduction: Antagonism (v. Agreeableness) is a continuous personality dimension that encompasses several lower-order traits, including aggression, callousness, distrust, and dishonesty. Antagonism is elevated in many psychiatric disorders, including borderline personality disorder (BPD), and has been linked to maladaptive outcomes. In the present study, we attempt to replicate the hierarchical structure of Antagonism in a sample enriched with BPD and examine whether higher- and lower- order facets of Antagonism differentially predict clinical outcomes, including history of suicidal behavior.

Methods: Participants included 318 adults diagnosed with BPD and 73 healthy comparison participants (55% had a previous suicide attempt), who completed a series of measures assessing Antagonism at baseline. Items from each measure were pooled, and iterative exploratory factor analyses were used to uncover the hierarchical structure of Antagonism. For predictive analyses, participants were grouped into low and high lethality attempters, non-attempters, and healthy comparison participants based on their responses on the Suicide History and Lethality Rating Scale.

Results: A 5-factor solution consisting of Narcissism, Distrust, Aggression, Dishonesty, and Callousness facets best fit the data. The hierarchical structure of Antagonism largely replicated previous findings in community samples. Distrust (B= .17, p< .001) and Aggression (B= .06, p< .001) positively predicted the likelihood of a BPD diagnosis. Distrust was also associated with a higher likelihood of having made a previous suicide attempt (B= .19, p< .001). Aggression was associated with a higher likelihood of having made a low lethality attempt (B= .57, p< .001) or no attempt (B= .53, p= .01) compared to a high lethality attempt.

Conclusion: The present findings replicate the hierarchical structure of Antagonism in a sample enriched with personality pathology. Lower-order facets of Antagonism differentially predict associations with personality pathology and suicidal behavior. Overall, our findings suggest that clinical prediction can be improved by conceptualizing broadband personality traits as hierarchical constructs.

Presenter: Brandon Sibbach, BS

Current Position: Staff

Title: **Manual segmentation of the bed nucleus of stria terminalis using multimodal 7 Tesla structural Magnetic Resonance Imaging**

Author(s):   *Sibbach BM[1] , Weber JC[2] , Lo D[1] , Banihashemi L[1]*

Affiliation(s):   *[1]Department of Psychiatry, University of Pittsburgh School of Medicine*

                    [2]Department of Bioengineering, University of Pittsburgh

Introduction: Overactivation of stress-related circuits can have deleterious effects on the brain and body, potentially increasing risk for certain psychopathologies. The bed nucleus of the stria terminalis (BNST), a small limbic forebrain structure, has been recently highlighted for its unique contributions to stress responses and anxiety. In preclinical animal models, the BNST plays a critical role in threat monitoring, as well as in addiction. Additionally, the oval nucleus is preautonomic and the fusiform nucleus receives dense viscerosensory, noradrenergic innervation, both nuclei have GABAergic neurons that express corticotropin-releasing hormone (CRH), known to be critical in behavioral responses to stress, fear and anxiety.?In human models, the oval and fusiform nuclei would encapsulate the dorsal and ventral aspects of the BNST, respectively. While research on the human BNST is increasing, investigators have primarily focused on anterior and posterior regions and their role in integrating and relaying emotional information,?while the distinct function and connectivity of dorsal and ventral regions within the BNST has not been addressed.

Methods: Using MRIcroGL, BNST segmentations were performed on 25 participants (2 with current affective disorders, age 21-35). Segmentations were based on the BNST's depiction in the Atlas of the Human Brain (Mai et al.). Susceptibility-Weighted Images were coregistered with, and subsequently overlaid on a T1-weighted MPRAGE. Boundaries were drawn using an angular approach based on the atlas depiction, which was then applied to each participant.

Results: Total ROI volume averaged 2526 voxels (0.42 cubic centimeters; SD = 24.94).
                    Segmentations of dorsal BNST had an average size of 1234 voxels (0.21 cubic centimeters; SD = 24.09), whereas the ventral BNST averaged 1292 voxels (0.22 cubic centimeters; SD = 26.44). Dorsal and ventral representations consumed 49.3% and 50.7% of total volume, respectively.

Conclusion: By isolating these subregions, a more accurate representation of BNST anatomy can facilitate our understanding of its contributions to stress-related psychopathology.?

Presenter:	Alfredo Sklar, MD, PhD
Current Position:	Faculty
Title:	**Clinical impact of impaired auditory cortex dynamic range in first-episode psychosis**
Author(s):	*Sklar AL[1] , Ren X[2] , Chipka L[1] , Coffman BA[1] , Salisbury DF[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Staff Scientist, Laureate Institute for Brain Research

Introduction:
There is a growing appreciation for the contribution of sensory disruptions to disease morbidity in psychosis. Auditory dynamic range, the scaling of neurophysiological responses to stimulus intensity, is an attribute of high-fidelity sensory systems that remains understudied in psychosis. The present study tested auditory cortex (AC) dynamic range among individuals with a schizophrenia spectrum illness during their first psychotic episode (FESz) and examined its relationship to symptoms and community functioning at disease onset.

Methods:
Magnetoencephalography (MEG) was recorded from 36 FESz and 40 matched healthy controls (HC) during binaural presentation of 1KHz tones at 3 intensities (75dB, 80dB, and 85dB). Structural MRIs were obtained to enhance cortical localization of MEG sensor-level activity. All participants completed the MATRICS cognitive battery (MCCB) and Global Functioning: Role and Social scales (GFR/GFS), and patients were administered the Positive and Negative Symptom Scale (PANSS).

Results:
FESz exhibited an overall reduced AC response to tones relative to HC (η^2=.13, p=.002). Importantly, the enhancement of AC activity to tones of increasing intensity observed across groups (η^2=.35, p<.001) was blunted in FESz relative to HC (η^2=.05, p=.03). Reduced dynamic range, defined as the increased AC activity from 75dB to 85dB, was associated with lower GFS (r=.62, p<.001) and GFR (r=.45, p=.006) scores, worse MCCB performance (r=.49, p=.003), and increased PANSS Negative symptom subscale scores (r=-.53, p<.001) among FESz.

Conclusion:
Beyond an impaired sensory response to pure tones, FESz exhibit reduced AC dynamic range relative to HC. This impairment was correlated with various markers of disease morbidity including poorer community functioning as well as cognitive and negative symptoms, though the most robust association was observed with social functioning scores. The relationship with impaired social functioning may reflect the role of AC dynamic range in decoding the emotional content of language and highlights its importance to future therapeutic sensory remediation protocols.

Presenter:	Dana Smith, BA
Current Position:	Undergraduate or Graduate Student
Title:	**Effects of chemogenetic manipulation of dopaminergic projections to amygdala on cocaine cue associative learning**
Author(s):	*Smith DM , Torregrossa MM*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Environmental cues paired with repeated drug use are a driver of relapse. Research shows the amygdala receives input from thalamic and cortical regions to encode the sensory component of drug-paired cues. Our lab has found that the VTA plays a role in encoding the interoceptive effects of drug that become associated with these cues as inhibition of the VTA to amygdala pathway dampens drug-cue learning. Yet, the specific contribution of dopaminergic neurons has not been characterized.

Methods: Heterozygous TH-cre rats received infusions of virus expressing a retrograde inhibitory cre-dependent DREADD (designer receptors exclusively activated by designer drugs) or a control virus into the lateral amygdala (LA). Following surgery to implant intravenous catheters, rats were trained to self-administer cocaine paired with an audiovisual cue for 14 days. Before each session, rats received i.p. injections of the DREADD ligand clozapine-N-oxide (CNO). Activation by CNO silences VTA dopamine neurons projecting to LA. After self-administration, animals had their cocaine-seeking behavior extinguished and underwent cue-induced and cocaine-primed reinstatement as tests of relapse-like behavior.

Results: There was no effect of silencing the VTA dopaminergic neurons projecting to LA on acquisition of cocaine self-administration as animals expressing the DREADD that received CNO did not differ from controls in infusions earned or lever presses. There were no effects on any reinstatement without CNO, but treating DREADD expressing animals with CNO just prior to the session significantly reduced cue-induced reinstatement.

Conclusion: These findings highlight the complexity of pairing interoceptive effects of drug with a cue. The dopaminergic neurons targeted by this chemogenetic manipulation may play a role as indicated by the effects seen during cue reinstatement combined with CNO exposure, but it is possible that other cell populations contribute or compensate as there was no impact on other measures of drug-cue learning such as acquisition of cocaine self-administration.

Presenter: Sierra Stringfield, PhD

Current Position: Postdoc Associate

Title: **Impact of delta-9-tetrahydrocannabinol on cortical activity during working memory task performance**

Author(s): *Stringfield SJ , Torregrossa MM*

Affiliation(s): *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Exposure to the primary psychoactive component of cannabis, delta-9-tetrahydrocannabinol (THC), can impact neuronal activity and behavior. Performance on working memory tasks requires the activation of the prelimbic prefrontal cortex, and THC acts on cannabinoid receptors in this brain region. We sought to investigate the acute and long-term effects of THC on working memory task performance and associated neuronal activity in the prefrontal cortex.

Methods: Male and female rats self-administered THC throughout adolescence and were trained on a delayed-match-to-sample working memory task in adulthood. Before training, rats were injected with a genetically encoded calcium indicator and implanted with a lens probe in the prelimbic prefrontal cortex for in vivo calcium imaging. Behavioral performance and associated neuronal activity were measured during test sessions where rats were injected with THC.

Results: Rats learned to perform the delayed-match-to-sample-task, performing more correct trials at the shorter delays with reduced accuracy at longer delay lengths. Injection with THC reduced task performance primarily in females, depending on the dose administered. The rate of calcium events recorded from individual cells was compared across each test session and surrounding behavioral events. There was a significant increase in neuronal activity during the delay phase preceding an incorrect response relative to activity preceding a correct response. Calcium event rates were also significantly elevated after injection with THC compared to vehicle.

Conclusion: We found that THC, at doses low enough to produce minimal behavioral effects, enhanced activity of principal neurons in the prelimbic prefrontal cortex that is specific to task performance. Further investigation of this effect can probe activity of individual neurons within and across sessions and in response to each pharmacological challenge. These results can be used to consider both the acute and long-term effects of different levels of THC exposure on cognitive performance.

Presenter:	Stephen Suss, MS
Current Position:	Staff
Title:	**Potential functional connectivity alterations in adolescents following concussion**
Author(s):	*Suss SJ[1] , Manelis A[1] , Lima Santos JP[1] , Eagle SR[2] , Holland CL[2] , Mailliard S[1] , Abdul-waalee H[1] , Stiffler RS[1] , Bitzer HB[2] , Blaney NA[2]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Orthopaedic Surgery/UPMC Sports Concussion Program, University of Pittsburgh

Introduction: Adolescent concussion is a growing public health concern, with adolescents often reporting longer and more severe symptoms than adults and younger children. Yet, the neurological mechanisms underpinning concussive symptoms at this developmental stage are not well understood. While resting state fMRI is a useful tool in examining these mechanisms, few studies have used this technique to examine the impact of concussion during adolescence.

Methods: 52 adolescents, 38 concussed (mean age = 15.6; female = 36.8%) and 14 controls (mean age = 15.1; female = 57.1%), underwent a 6.5 minute resting state scan. Independent component analysis (ICA) and dual regression were used to derive and analyze whole brain large scale networks. Measures of post-concussion functioning and symptoms, as well as prior history of somatic symptoms, were collected.

Results: We discovered that controls had significantly greater functional connectivity than concussed participants between the dorsal attention network (DAN) and right inferior frontal gyrus (RIFG; t-max = 6.2, p = 0.0008). Additionally, we found that concussed participants with a history of migraines had significantly lower connectivity than concussed participants without this history (t = 2.1, p = 0.047). No association between post-concussion symptoms and DAN-RIFG connectivity was discovered.

Conclusion: Our findings indicate that sustaining a concussion may disrupt DAN-RIFG connectivity, but there is no correlation between this connectivity and post-concussion symptoms. This suggests an "all or nothing" functional change in response to injury and future research is warranted to better understand what role these regions play in adolescent concussion.

Presenter:	Emily Thacker, PharmD
Current Position:	Resident
Title:	**Characterization of agents used for the treatment of Behavioral and Psychological Symptoms of Dementia (BPSD)**
Author(s):	*Thacker EP[1] , Joseph MP[1] , Gutowski MJ[1] , Crabtree RK[1] , Sun CN[2] , Fielding KL[1] , Fabian TJ[3]*
Affiliation(s):	*[1]Department of Pharmacy, UPMC Western Psychiatric Hospital*
	[2]Department of Pharmacy, University of Pittsburgh School of Pharmacy
	[3]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Behavioral and psychological symptoms are frequent and well-documented aspects of dementia, however, the preferred pharmacotherapy option for treatment is controversial. The purpose of this study was to evaluate the prescribing trends for treatment of BPSD within the geriatric service of a psychiatric hospital, and to determine if differences exist in clinical outcomes based on the pharmacologic therapy selected.

Methods: A retrospective chart review was performed to evaluate trends in discharge prescriptions of patients aged 65 or older admitted to and discharged from the geriatric service of UPMC Western Psychiatric Hospital (WPH) during 2021, who had a primary diagnosis related to BPSD. Patient characteristics, discharge medication regimens, attending providers, length-of-stay (LOS), documented falls, and 30-day readmissions were collected.

Results: A total of 276 patients were screened for inclusion with 91 patients meeting criteria for analysis. More than a third of the patients had comorbid psychiatric conditions (36.3%, n=33). Of those who were discharged with?medications to treat BPSD, the average number of medications prescribed at discharge was 3.02 ± 1.49. Commonly prescribed discharge regimens included antipsychotics (75.8%), antidepressants (63.7%), medications for insomnia (56.0%), cholinesterase inhibitors (27.5%), mood stabilizers (26.4%), NMDA antagonists (15.4%), and benzodiazepines (8.8%). Those with falls (n=26) were more likely to be prescribed benzodiazepines (15.4% vs 8.8%), mood stabilizers (34.6% vs 26.4%), medications for insomnia (61.5% vs 56.0%), antipsychotics (80.8% vs 75.8%) and antidepressants (65.4% vs 63.7%). Length of stay data were variable (3 to 147 days) with differences noted based on the presence (median LOS (IQR) 12 days (8-17)) or absence (median LOS (IQR) 20.5 days (12-31)) of a comorbid psychiatric condition.

Conclusion: Behavioral and psychological symptoms of dementia are a common reason for psychiatric admission, and often co-occur with psychiatric conditions. Overall, medication regimens appear to be provider specific and influenced by secondary psychiatric diagnoses and/or type of neurocognitive impairment. Differences in drug therapy appear to influence safety and efficacy outcomes, with notable differences in length of stay and reported falls.

Presenter:	Salome Vanwoerden, PhD
Current Position:	Postdoc Scholar
Title:	**Maternal depression affects positive affect dynamics with children and children's social outcomes during middle childhood**
Author(s):	*Vanwoerden S[1] , Forbes E[1] , Silk J[2] , Morgan J[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Psychology, University of Pittsburgh

Introduction: Maternal depression negatively predicts aspects of social functioning in offspring, which is particularly detrimental during middle childhood when children first engage in reciprocal friendship. Research points to aspects of mother-child interaction as a factor explaining these associations. Positive affect synchrony is especially relevant for offspring's social outcomes; however, studies rarely examine this dynamically. The current study evaluated the effect of mothers' depression history and current depression severity on a range of child social outcomes. We also examined how dynamic indices of positive affect synchrony affected these associations.

Methods: N=76 mother-child dyads (child age: M=6.81, SD=0.76; 52% male) in which 50% of mothers had a history of maternal depression were recruited. Dyads engaged in a free-play task in the lab, which was coded for mother and child positive affect. We calculated dynamic indices of positive affect synchrony using State Space Grids. Mothers and children also reported on friendship functioning and social problems.

Results: Maternal depression was not related to mother-reported social problems in offspring; however, it was related to both general and best friend relationship quality. Whereas depression history was more relevant for general friendship quality, current maternal depression severity was relevant to the quality of best friendship. Positive affect synchrony was positively related to general friendship quality. Furthermore, when we included this measure in the model alongside maternal depression history, the effect of depression history become negligible.

Conclusion: Results confirm the effect of maternal depression on aspects of child social outcomes; however, effects were specific to friendship functioning, which is a unique and often overlooked aspect of social functioning during middle childhood. Furthermore, we found preliminary evidence that positive affect synchrony is a mechanism explaining this association. Results have important implications for prevention and intervention among families in which mothers have either a history or current expressions of depression.

Presenter: Madison Very

Current Position: Undergraduate or Graduate Student

Title: **Effectiveness of an online digital parenting program on improving parent-child interactions for families experiencing vulnerability**

Author(s):   *Very M[1] , Zheng Z[2] , Huang Z[2] , Patel PC[2] , Choi JY[2] , Banerjee M[1] , Komanchuk J[3] , Letourneau N[3] , Cameron JL[4]*

Affiliation(s):   *[1]Department of Neuroscience, University of Pittsburgh*

[2]Applied Developmental Psychology, University of Pittsburgh

[3]Department of Nursing, University of Calgary

[4]Department of Psychiatry, University of Pittsburgh School of Medicine

Introduction: Early life stresses can have a dramatic negative impact on a child's development. Because of this, there is increasing interest in identifying possible early interventions to help counteract stress-induced developmental delays. As interactive parenting practices have been shown to help mitigate the impact of early adversity, our goals in this study were to develop an intervention that would be enjoyable for both children and parents and would strengthen interactive parenting practices.

Methods: We created the First Pathways Game, a free online game with over 250 cooperative age-appropriate activities for children (ages birth-8 years of age) and adults to play together. To test if playing the First Pathways Game improves the quality of interactions between parents and children, 100 parent-child dyads (children from 0-3 years of age) were recruited from a 7 social service agencies in Calgary, Canada (50 playing the game, 50 controls). Dyads were taught how to access the game on their phones and were then videotaped for ten minutes playing the games when they were introduced to the game and again 1 month later. Both 10-minute videotapes were analyzed using the Simple Interactions coding for the three dimensions of a healthy relationship: Connection, Reciprocity, and Opportunity to Grow, as well as the PICCOLO coding system.

Results: Dyads played the game 19.8 ± 1.87 times during the study. Reciprocity in the parent-child interactions significantly improved in the game play group, $p=0.009$, but not in the control group. The change in reciprocity was negatively correlated with baseline reciprocity, $r2=-0.34$, $p=0.014$), such that dyads with the poorest interactions improved the most. There was a strong correlation between Simple Interaction and Piccolo coding systems, $r2=0.54$, $p<0.001$.

Conclusion: We conclude that cooperative games for parents and children to play together that strengthen developmental skills are effective in improving parent-child interactions, particularly in dyads with poor skills initially.

Presenter:	Kirsten Wade, BA, BS
Current Position:	Staff
Title:	**Lower GAD67 mRNA levels in somatostatin and calretinin neurons in the prefrontal cortex of schizophrenia**
Author(s):	*Wade KL , Dienel SJ , Lewis DA , Fish KN*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: In schizophrenia, mRNA levels of the principal GABA synthesizing enzyme, GAD67, are markedly lower in layers 2-superficial 3 of the dorsolateral prefrontal cortex (DLPFC). GAD67 is expressed in all GABA neuron subtypes, yet the subtypes that contribute to the GAD67 deficit in schizophrenia are incompletely understood. This superficial laminar zone is enriched for two GABA subtypes, somatostatin (SST) and calretinin (CR)-expressing neurons, suggesting that at least one of these may contribute to the GAD67 deficit in schizophrenia. However, GAD67 levels in these cell types have not been directly examined in schizophrenia.

Methods: Fluorescent in situ hybridization was performed in 24 pairs of schizophrenia and matched unaffected comparison subjects. All GABAergic neurons were identified based on the expression of vesicular GABA transporter (VGAT), the expression of which is not altered in schizophrenia. Levels of GAD67 mRNA were quantified in all VGAT-positive neurons and in the subsets that expressed SST or CR mRNA.

Results: Within SST cells, mRNA levels of both GAD67 (Cohen's $d = \neg0.78$; $p = 0.01$) and SST ($d = 0.72$, $p = 0.026$) were lower in schizophrenia. In CR neurons, GAD67 levels were lower, albeit with a smaller effect size ($d = 0.55$, $p = 0.048$), but CR mRNA was not altered ($p = 0.42$) in schizophrenia. GAD67 mRNA levels were also modestly lower in VGAT cells without SST or CR mRNA ($d = \neg0.50$; $p = 0.087$).

Conclusion: Lower GAD67 levels in SST and CR neurons suggests that both subtypes exhibit weaker inhibition in schizophrenia. Because SST neurons tend to target excitatory cells, whereas CR neurons tend to target other inhibitory cells, altered levels of both inhibition and disinhibition might contribute to DLPFC dysfunction in schizophrenia.

Presenter:	Andrea Weinstein, PhD
Current Position:	Faculty
Title:	**Mobile cognitive testing in older adults at risk for Alzheimer's disease**
Author(s):	*Weinstein AM[1] , Rothenberger S[2] , Cohen A[1] , Snitz B[3] , Kimutis S[1] , Zmuda M[1]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]Department of Medicine, University of Pittsburgh
	[3]Department of Neurology, University of Pittsburgh School of Medicine

Introduction: Characterizing very early stages of Alzheimer's disease (AD) is imperative for prevention and treatment efforts, but AD neuropathology develops several years prior to impaired neuropsychological test performance. There is a need for cognitive assessment that capture AD risk and assesses cognition in a cost-effective manner. The current study used smartphone-based mobile cognitive testing (MCT) to probe cognitive performance over several days. The primary goal was to examine the feasibility of collecting MCT data older adults and compare performance with validated cognitive assessments. A secondary goal was to examine whether MCT performance mean or variability was associated with worse cognitive performance.

Methods: Participants were recruited from ongoing longitudinal, observational studies conducted in the Pittsburgh, PA area. The study MCT protocol (https://www.getneuroux.com/) consisted of 4 assessments per day over 10 days; data from Memory List (word list learning and recognition) and Matching Pair (visual search and processing speed) are presented here. NIH Toolbox assessments were used as a validated cognitive comparison. MCT performance was calculated by within-person mean and within-person standard deviation for each MCT task and modeled for each NIH Toolbox task.

Results: Forty participants (mean age = 73.6 years, range = 67-91; mean education = 15 years, range = 10-19 years; 21 female; 77% white) completed the protocol. On average, participants completed 91% (63% to 100%) of all MCT assessments. Age was associated with variability, but not mean, performance on Matching Pair, but not significantly associated with either mean or variability for Memory List. When comparing mean vs. variability in MCT performance and NIH Toolbox cognitive measures, MCT variability was more consistently associated with Toolbox performance.

Conclusion: MCT measures of cognition are feasible to collect in older adults and well tolerated. MCT measures correlate with established measures of cognitive performance, with MCT performance variability possibly being a more sensitive measure.

Presenter:	Cecilia Westbrook, MD PhD
Current Position:	Resident
Title:	**Neural substrates of approach-avoidance conflict and association with response to psychotherapy in youth with anxiety disorders**
Author(s):	*Westbrook C[1] , Schlund M[2] , Siegle G[1] , Silk J[3] , Dahl R[4] , Forbes E[1] , McMakin D[1] , Kendall P[5] , Mannarino A[6] , Ladouceur C[1]*
Affiliation(s):	[1]*Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2]*Department of Psychology, Georgia State University*
	[3]*Department of Psychology, University of Pittsburgh*
	[4]*School of Public Health, University of California, Berkeley*
	[5]*Department of Psychology, Temple University*
	[6]*Department of Psychiatry, Allegheny Health Network*

Introduction: Anxiety psychopathology is characterized by avoidance, which can become problematic when it prevents an individual from pursuing rewarding activities. A goal of psychological treatment is to help anxious individuals learn to overcome avoidance tendencies that prevent them from attaining rewarding goals. "Approach-Avoid Conflict" paradigms model situations in which these two drives—reward approach and loss avoidance—are both activated and compete within an individual. Thus, they provide insight into how an anxious individual resolves this conflict, and by extension, could point to behavioral and neural mechanisms underlying both anxious psychopathology as well as potential treatment targets.

Methods: This project involves analysis of fMRI data in the Approach-Avoid task from the Child Anxiety Treatment Study (CATS), a randomized clinical trial of CBT vs. active control (Child Centered) therapy in anxious youth. Our primary hypothesis is that greater approach-avoid conflict activity will predict treatment response. A total of 118 youth age 9-14 completed a diagnostic assessment and MRI scan prior to randomization into CBT (N=79) or CCT (N=39). 60 CBT and 31 CCT participants completed treatment and had post-treatment MRI scans. An additional group of 46 participants without psychiatric disorders completed scans at the same time points but did not undergo treatment.

Results: Data analyses are ongoing and results are pending.

Conclusion: Results of this study may provide insights into mechanisms of therapy response focusing on approach and avoidance systems in the developing human brain.

Presenter:	Eleanor Williams, BA
Current Position:	Staff
Title:	**Sexuality-specific parental support impacts stress reactivity in an adult LGB sample**
Author(s):	*Williams E[1] , Hipwell A[1] , Berona J[2] , Francisco M[1] , Keenan K[3]*
Affiliation(s):	*[1]Department of Psychiatry, University of Pittsburgh School of Medicine*
	[2] Institute for Sexual and Gender Minority Health and Wellbeing, Northwestern University Feinberg School of Medicine
	[3]Department of Psychiatry and Behavioral Neuroscience, The University of Chicago

Introduction: Increased physiological reactivity following a stressful event is linked to negative health outcomes (e.g., Thomas & Lovallo 2003). LGB women exhibit higher stress reactivity (Juster et al., 2015) and more stressful life events than heterosexual peers (Meyer et al., 2008). LGB adults also report lower familial support (Eisenberg & Resnick, 2006; Newcomb et al., 2017) which is a protective factor to stress reactivity (Burton et al., 2013). Little is known about sexuality-related social support (Meyer et al., 2008) as a protective factor to stress. We examined whether overall family relationships and parental support in coming out are associated with cortisol response following a stressor in an LGB sample.

Methods: Participants included 150 LGB young women (63.0% Black; 33.7% White; 9.3% Other) (27.3% lesbian/gay; 72.7% bisexual). A discrimination-based stress task (TSST) was administered as a social stress probe (Kirschbaum et al., 1993; Keenan et al., 2021), with saliva collected throughout the task to measure cortisol reactivity. Participants were administered the UCLA life-stress interview (Hammen, 1987) to assess overall family functioning and the Parental Support in Coming Out Questionnaire (Mohr & Fassinger 2003).

Results: Parental support for coming out and family functioning were moderately correlated (spearman = -0.335, $p < .001$). Cortisol reactivity (AUC) was associated with parental support for coming out, but not with general family functioning. A repeated measures ANOVA revealed that cortisol reactivity was attenuated for women reporting levels of parental support at or above the median for the sample compared to women reporting levels of parental support below the median cortisol reactivity ($F_{[2.71,406.72]}= 3.93$, $p=0.011$).

Conclusion: Parental support in coming out may be uniquely protective for LGB women in response to discrimination. Research is needed to probe the mechanisms of sexuality specific social support that protect against discrimination-stress related health outcomes in an LGB population.

Presenter:	Michelle Wilson, BS
Current Position:	Staff
Title:	**Infant temperament as a predictor of early ADHD symptoms and parenting self-efficacy in toddlerhood**
Author(s):	*Wilson MA , Molina BSG , Joseph HM*
Affiliation(s):	*Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Difficult temperament in early childhood has been associated with both later development of ADHD and parents' self-efficacy and parenting satisfaction. However, the relationship among these factors has not been fully investigated, and few studies have leveraged longitudinal data to examine these relationships across time. This study aims to test the relations among infant temperament, ADHD symptoms in toddlerhood, and parenting efficacy and satisfaction in families with and without ADHD.

Methods: 128 parents from 66 families completed measures of child temperament, child ADHD symptoms, and parenting efficacy and satisfaction. 32 families had at least one parent with ADHD, and for 34 families neither parent had ADHD. There were no significant differences across groups for race, parent education, age, or child sex; high-risk parents reported lower household incomes than low-risk parents. Families completed measures at two time points: in infancy (M=8 months of age) and in toddlerhood (M=20 months of age).

Results: Infants at high familial risk for ADHD had higher parent-reported levels of surgency (t=2.884, p=.005) and negative affect (t=2.100, p=.038) than low-risk infants. After accounting for household income, infant effortful control predicted lower toddler ADHD symptoms in the high-risk group (ß=-.331, p=.020) and marginally predicted lower toddler ADHD symptoms in the low-risk group (ß=-.248, p=.057). In ADHD families only, higher infant surgency (ß=.481, p=.001) and lower negative affect (ß=-.269, p=.043) predicted higher self-reported parenting efficacy in toddlerhood.

Conclusion: This study confirms emerging research indicating that temperament in infancy may be a very early indicator of later ADHD. Interestingly, in our sample, there was a difference between families with and without ADHD, indicating that parents who have ADHD or have a co-parent with ADHD may be more likely to experience reduced parenting self-efficacy in response to difficult child temperament.

Presenter: Tyia Wilson, PhD

Current Position: Postdoc Scholar

Title: **Racial discrimination & microaggressions differently associated with alcohol and cannabis use and motives**

Author(s): *Wilson TK , Wallace ML , Pedersen SL*

Affiliation(s): *Department of Psychiatry, University of Pittsburgh School of Medicine*

Introduction: Exposure to traumatic events, such as racial discrimination and microaggressions are linked to adverse health outcomes, including substance use. However, this research is largely cross-sectional, does not examine distinct domains of discrimination experiences, and has focused predominantly on alcohol use. The study examined the prospective associations between multiple domains of discrimination and alcohol and cannabis use outcomes 6 months later.

Methods: The sample included 43 Black young adults who drank alcohol at least weekly (Mage=25, 65% assigned female at birth) who completed questionnaires at baseline and 6-month follow up as part of a larger ongoing study. Participants self-reported their racial discrimination experiences (Everyday Discrimination Scale), microaggressions (Racial and Ethnic Microaggressions Scale; 5 domains), alcohol and cannabis use, problems, and motives (reasons for use). Hierarchal linear regressions controlling for age, sex, and income estimated the relationship between racial discrimination, microaggressions, and substance use outcomes.

Results: Higher reports of racial microaggressions were related to higher alcohol problems prospectively (B=5.75, p=.03). Racial discrimination and microaggressions were related to greater cannabis problems (B=.191, p=.02; B=6.03, p=.005) follow-up. Racial microaggressions were also related to several domains of cannabis motives 6 months later. Specifically, more frequent experiences of assumptions of similarity were related to more frequently using cannabis for conformity reasons (B=1.04, p< .001), to cope with stress (B=1.21, p=.003), for experimentation (B=1.15, p=.005), to experience altered perceptions (B=1.11, p=.036), and ease social anxiety (B=1.16, p=.004).

Conclusion: These finding highlights the potential significance of racial microaggressions and discrimination on alcohol and cannabis behaviors over time and can inform future research in the area of trauma exposure and substance use risk and motives among Black young adults. Additional analyses will be conducted incorporating baseline substance use, indicators of structural racism, general stress level, multiple discrimination domains and alcohol and cannabis outcomes within the same model to increase understanding of specificity.

Presenter:	Emma Win, BS
Current Position:	Undergraduate or Graduate Student
Title:	**Online victimization among sexual and gender minority youth with and without communication deficits: Examining lived experience and considering implications for technology-based intervention**
Author(s):	*Win E[1] , Biernesser CL[2] , Goldstein TR[2]*
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Introduction: Sexual and gender minority (SGM) youth are nearly three times more likely to experience online victimization (OV) than non-SGM youth. OV (disparaging remarks, images, or behaviors that inflict harm through digital devices) is linked to suicidal risk and other psychopathology. Individuals with autism spectrum disorder (ASD) often experience communication deficits (CD), such as trouble understanding other's intentions. Therefore, SGM youth with CD may be especially vulnerable to the impact of OV. There is a lack of research investigating how SGM youth with CD understand and respond to OV.

Methods: We are currently conducting brief assessments (including the Autism-Spectrum Quotient [AQ] communication subscale) and qualitative interviews with SGM adolescents, ages 12-17, who reported OV experiences in the past-year and lifetime suicidality. Data collection focuses on OV experiences, mental health impacts, and perceptions toward a suicide-prevention intervention. Data is being recorded and transcribed. Qualitative data will be analyzed with qualitative comparative analysis and triangulated with descriptive quantitative data from assessments. Recruitment is currently 75% complete toward a goal of enrolling 20 SGM youth. By April 30th, 2022, all data collection and analysis will be complete prior to Research Day.

Results: Preliminary analysis suggests that SGM youth scoring 7 or above on the AQ communication subscale reported difficulty interpreting the meaning and intent behind OV, whereas those scoring below 7 did not. Additionally, youth with greater CD found it important to include an intervention feature that could help youth interpret the meaning and intent behind OV, whereas those with lower found this less important.

Conclusion: SGM youth with communication deficits may experience and respond to OV in unique ways, including the importance and challenge of understanding the meaning and intent behind the interaction. Understanding how SGM with ASD or CD experience and respond to OV could help create more inclusive interventions.

Presenter: Yicheng Zhang
Current Position: PhD Candidate
Title: An automated cortical parcellation pipeline for infant MRI to explore infant brain-behavior patterns
Authors: Zhang Y[1], Banihashemi L[2], Samolyk A[2], Versace A[2], Taylor M[2], English G[2], Northrup JB[2], Schmithorst VJ[3], Lee VK[3], Stiffler R[2], Aslam H[2], Panigrahy A[3], Hipwell AE[2], Phillips ML[2]
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Introduction:

Frontal cortical regions are known to support emotional functions differentially by subregion. Few studies have used subregion-specific structural patterns as objective markers underlying infant emotion processing. To explore the extent to which structural features of distinct frontal cortical subregions are related to emotional outcomes in infancy, we designed an automated cortical parcellation pipeline compatible with both T1- and T2-weighted structural magnetic resonance imaging (T1 and T2 MRI) that is robust for use in infant neuroimaging.

Methods:

3-month infant preprocessed (bias-corrected and skull-stripped) T1 or T2 image is the input for this pipeline: The input image undergoes FAST segmentation with FSL 6.0 toolbox to extract the gray matter (GM) mask. Cortical GM regions of interest (ROIs) are segmented based on the Desikan-Killiany-Tourville (DKT) cortical parcellation protocol. Due to different sizes, morphology, and contrast, directly registering the adult DKT atlas can result in inaccuracies. Here, a pseudo DKT gyral map was created from the adult DKT labels dilated by a 7 x 7 x 7 voxel kernel, and a cerebrospinal fluid (CSF) mask was applied to remove mislabeled pixels in the CSF resulting from dilation. The adult DKT imaging template is registered to the input 3-month infant T1 or T2 MRI in native space via the symmetric diffeomorphic approach in the ANTs toolbox. The created DKT gyral map is propagated to the input image by the same transformation. The GM mask for the input image is applied to the registered DKT gyral map for parcellating the GM by cortical subregions. The Infant Behavior Questionnaire-Revised (IBQ) was used to assess infant behavior concurrent with imaging. The IBQ Negative (composite of Sadness, Distress, Fear, and Falling Reactivity) and the IBQ Positive (composite of Smiling/Laughter and High Pleasure) assessed negative and positive emotionality (NE, PE), respectively. To lessen the impact of the external environment in which the infant grows up, which also shapes the development of infant emotional health, sociodemographic variables for both the infant and caregiver were controlled. We used 10 frontal cortical ROIs in each hemisphere (medial and lateral orbitofrontal, rostral and caudal anterior cingulate, superior frontal, pars opercularis, pars orbitalis, pars triangularis, and rostral and caudal middle frontal) to model infant brain-behavior relationships. The absolute volume of the whole-brain cortical GM was also extracted as the baseline of the general brain development level for each individual. The volume of each ROI is added up across hemispheres, divided by the global cortical GM volume and standardized to the range of 0 to 1. These volumetric features by frontal cortical subregions are corrected for sociodemographic covariates and modeled using bivariate linear fit with concurrent NE and PE. To maximize the subject size, we merged the extracted volumetric features from both imaging modalities. Due to the T1 and T2 characteristics differences, 3-month T1 images are more vulnerable to motion and have worse tissue contrast. Therefore, volumetric features extracted from T2 images were preferred. A correction term for T1-extracted features was applied.

Results:

62 T1 and 57 T2 MRI for 3-month healthy, term-born infants (n = 77, male/female = 38/39) have been successfully acquired and processed through our cortical parcellation pipeline. The parcellation quality for each subject was first visually inspected by trained research assistants. GM Specificity: Results parcellated from each imaging modality were evaluated for the quality of GM specificity through the standard deviation of signal intensity by cortical subregions. The overall average standard deviation of signal intensity is 6.41 and 8.81 for T1 and T2 images, respectively. Multimodal Volumetric Consistency: Results from 42 subjects with both imaging modalities were used to test the consistency of the parcellation across T1 and T2 images. The volume of each ROI within the whole brain (i.e., 62 ROIs, including left and right hemispheres) was averaged by imaging modality and a cube root operation was performed to ensure a normal distribution. A 2-tailed paired t-test of the T1 and T2 group (p = 0.546, α = 0.05) indicates the segmentations from each of the two imaging modalities from our cortical parcellation pipeline are consistent. Exploratory Infant Brain-Behavior Correlations: The standardized absolute whole-brain cortical GM volume is negatively correlated with NE (p = 0.066, α = 0.05) and the standardized proportion volume of the superior frontal cortex is positively correlated with NE (p = 0.031*, α = 0.05); the standardized proportion volume of the pars orbitalis is positively correlated with PE (p = 0.122, α = 0.05).

Conclusion:

Our automated cortical parcellation pipeline shows robust utility in extracting cortical GM for both T1 and T2 infant neuroimaging modalities. Volumetric features extracted from our pipeline can be utilized for further infant brain-behavioral studies.