Conclusions: Suicide attempters high in trait impulsivity display abnormal vmPFC-cognitive control region connectivity during value-based decision-making, which undermines their ability to utilize reinforcement history in their choices.
Supported By: NIMH
Keywords: Reinforcement Learning, Suicide, fMRI, Computational Modeling

F78. The Impact of Family History of Depression on the Relation Between Episodic Memory Encoding and Intrinsic Hippocampal Connectivity

Christina Young[1], Ardesheer Talati[2], Jonathan Posner[3], Myrna M. Weissman[4], and Stewart Shankman[5]

[1]Stanford University School of Medicine, [2]New York State Psychiatric Institute, [3]Columbia University & New York State Psychiatric Institute, [4]New York State Psychiatric Institute, College of Physicians and Surgeons of Columbia University, [5]University of Illinois at Chicago

Background: Family history of major depression (FH-MDD) connotes significant risk for depression, although the processes that mediate risk are unknown. Episodic memory encoding is one potential process as depression is robustly associated with deficits in encoding. Encoding is dependent on the hippocampus, a region with structural and functional abnormalities in depression. This study examines whether the association between hippocampal connectivity and episodic memory encoding is abnormal in those with FH-MDD, potentially reflecting a key mechanism of MDD's familial transmission.
Methods: Resting-state fMRI data were collected from 10 subjects with no FH-MDD, 23 with one generation of FH-MDD (parent or grandparent), and 20 with two generations of FH-MDD. FH-MDD was defined via direct interview and blind to proband's clinical status. Brain regions that showed a significant relation between intrinsic hippocampal connectivity and encoding (Wechsler Memory Scale-III) were further examined to determine the impact of FH-MDD.
Results: Preliminary results suggest that encoding was negatively correlated with hippocampus connectivity with medial prefrontal cortex (mPFC), pre- and post-central gyrus, supramarginal gyrus, and temporal pole. There was a trending Encoding x FH-MDD interaction for hippocampal-mPFC connectivity, $F(2,47)=3.023$, $p=.058$, such that those with no FH-MDD had a more negative relation ($r=-0.766$) between hippocampal-mPFC connectivity and encoding compared to individuals with one ($r=-0.661$) or two ($r=-0.420$) generations of FH-MDD. No other regions showed significant interactions.
Conclusions: Our preliminary results suggest that FH-MDD moderates the relation between episodic memory encoding and hippocampal-mPFC connectivity. Thus, FH-MDD may change the way the brain supports this critical cognitive ability, thereby increasing risk for developing MDD.
Supported By: NIMH RO1 036197
Keywords: Resting State fMRI, Family History, Major Depressive Disorder (MDD), Hippocampus, Encoding Memory

F79. Confidence and Action in Trans-Diagnostic Psychiatric Symptom Dimensions

Xing Fang Tricia Seow[1] and Claire Gillan[1]

[1]Trinity College Dublin

Background: Previous work has shown success utilising trans-diagnostic dimensions to disambiguate confidence relationships in psychiatry; in a perceptual decision-making task, 'Anxious-Depression' manifested in low confidence while 'Compulsivity' was related to over-confidence (Rouault, Seow et al., 2018). It remains unclear if these differences in confidence affect behaviour control — a key issue for disorders of compulsivity.
Methods: A general population sample ($N = 439$) performed a predictive inference task via Amazon's Mechanical Turk. We tested how individuals used feedback in the environment to update behaviour and confidence estimates, and the extent to which this process goes awry in distinct trans-diagnostic dimensions of psychopathology.
Results: Consistent with our previous report, individuals high in 'Anxious-Depression' had lower overall confidence, while 'Compulsive' individuals showed higher confidence ($Ps < .001$). As one might expect, trial-by-trial confidence appropriately tracked participants' tendency to adjust their decisions. While this coupling was intact in individuals high in 'Anxious-Depression', we observed an evident breakdown in the link between confidence and action for those high in 'Compulsivity' ($P < .001$).
Conclusions: Although 'Anxious-Depression' was linked to low overall confidence, confidence was nonetheless tightly linked to behaviour. In contrast, 'Compulsivity' was associated with overestimated confidence and a deficit in their ability to update behaviour as their confidence changed. These data are consistent with models of compulsive disorders that highlight how behaviour becomes divorced from intention.
Supported By: ISSF
Keywords: Confidence, Action Selection, Transdiagnostic Traits, Compulsivity, Anxious Depression

F80. Poster Withdrawn

F81. Combining Dorsolateral Prefrontal Repetitive Transcranial Magnetic Stimulation and Attentional Bias Modification Does Not Attenuate Maladaptive Attentional Processing in Dysphoric Students

Leonore Bovy[1], Martin Möbius[2], Martin Dresler[1], Guillén Fernández[1], Alan Sanfey[2], Eni Becker[2], and Indira Tendolkar[1]

[1]Donders Institute, Radboud UMC, [2]Behavioural Science Institute

Background: High frequency repetitive Transcranial Magnetic Stimulation (rTMS) over the left dorsolateral prefrontal cortex (DLPFC) has been shown to reduce depressive symptoms and improve cognitive biases such as attention

bias. One promising technique that may complement rTMS treatment is attention bias modification (ABM) training, given the similarity in modulating attention bias and affecting neuronal activity.
Methods: We tested whether the combination of rTMS treatment and ABM training in a single session would attenuate maladaptive attentional processing and improve mood in participants with subclinical depressive symptoms. We included 72 dysphoric but otherwise healthy participants who showed a heightened BDI-II score (between 9 and 25) in our main analyses. Participants were randomly assigned to one of four groups, receiving either 1) a single ABM treatment, 2) a single rTMS treatment, 3) a combination of ABM and rTMS or 4) a sham treatment.
Results: Mixed ANOVAs and supporting Bayesian analyses revealed no significant changes in attentional bias, attentional control, or mood after a combination treatment of rTMS and ABM training in a single session ($p=.641$, $BF10=0.005$), nor did a single session of rTMS independent of ABM training affect attentional bias systematically ($p=.571$, $BF10=0.019$).
Conclusions: The combined effect of rTMS and ABM treatment did not yield any significant differences as compared to control conditions, which was supported by additional Bayesian analyses. The null findings will be discussed in the light of the sample size, dosage and task specifics. Lastly, we will relate our findings to the ongoing discussion on ABM training in depression.
Supported By: Other
Keywords: Attentional Bias Modification, Transcranial Magnetic Stimulation (TMS), Dysphoria, Depression

F82. Attention Impairments and the "Inattention Biotype" in Major Depressive Disorder

Arielle Keller[1], Tali Ball[1], and Leanne Williams[2]

[1]Stanford University, [2]Department of Psychiatry and Behavioral Sciences, Stanford University, [2]Stanford University & Sierra-Pacific Mental Illness Research, Education, and Clinical Center (MIRECC) VA Palo Alto Health Care System

Background: Attention impairment is an under-investigated feature and diagnostic criterion of Major Depressive Disorder (MDD) that predicts poorer prognoses. Despite the centrality of attention for a variety of critical cognitive functions, we lack a detailed characterization of attention impairments and their neural signatures in MDD patients.
Methods: We advance a deep multi-modal characterization of selective attention impairment in MDD, using data acquired from $n=1008$ MDD patients and $n=336$ age- and sex-matched healthy controls participating in the international Study to Predict Optimized Treatment for Depression. Our characterization is anchored in a behavioral marker of selective attention and validated by independent measures of large-scale network dysfunction (fMRI, 15% of sample), oscillatory neural activity (EEG), and clinical symptoms.
Results: Selective attention impairment in MDD, unlike other cognitive behavioral measures, is specifically associated with intrinsic hypo-connectivity of the fronto-parietal attention network ($r(97)=0.23$, $p=0.02$) and not other networks (p's>.05). This attention impairment is also associated with decreased alpha (8-13 Hz) power at rest ($r(678)=-0.154$, $p<.001$), demonstrating that intrinsic connectivity and resting-state synchrony are related to a specific attention behavior measured independently. Selective attention impairment is independent of insomnia, excessive worrying, or depression symptom severity (p's>.05), but may increase negative biases ($r(679)=0.234$, $p<.001$) potentially perpetuating sad mood.
Conclusions: Attention impairment in MDD patients represents a distinct biotype of depressed individuals that is specific, cohesive, and observable across multiple units of analysis. Our findings provide a target for development of precise therapeutics to address inattention and inform a novel theoretical framework for understanding the biological pathways underlying attention impairment in MDD.
Supported By: National Defense Science and Engineering Graduate Fellowship (NDSEG)
Keywords: Attention, Fronto-Parietal Network, Alpha, biotypes, Cognitive Impairment

F83. Differential Effects of Ketamine on Mood Symptoms and Cognitive Function in MDD and PTSD

Margaret Davis[1], Robert Pietrzak[2], Paul Maruff[3], Nicole DellaGioia[1], David Matuskey[4], and Irina Esterlis[4]

[1]Yale University, [2]VA National Center for PTSD, [3]Cogstate, Inc, [4]Yale University School of Medicine

Background: Ketamine, a dissociative anesthetic, is effective in reducing psychiatric distress in individuals with major depression (MDD) and posttraumatic stress disorder (PTSD). However, the effect of ketamine administration on cognition in these disorders has not been directly investigated. The present study sought to address this area by exploring the effect of ketamine administration on a battery of cognitive tests in individuals with MDD, PTSD, and age and sex matched healthy controls.
Methods: Individuals with MDD ($N=14$), PTSD ($N=14$), and healthy matched controls (HC; $N=17$) were recruited from the community. An average dose of 0.5 mg/kg ketamine was delivered intravenously over 40 minutes. Measures of mood (MADRS, HAM-D, PCL), and cognition (Cogstate battery) were collected prior to ketamine administration and at 1 and 24 hours post-administration.
Results: In both MDD and PTSD groups symptom severity was reduced following ketamine administration (p's<.001). Performance on visual memory ($p=.015$; $\eta 2p=.19$), verbal learning ($p<.001$ $\eta 2p=.39$), and psychomotor speed ($p=.013$; $\eta 2p=.20$) tasks worsened immediately following ketamine administration (i.e., lower verbal recall, slowed reaction times), and then returned to baseline levels 24-hours later. No group x test interactions were observed, suggesting the observed pattern of change did not differ by diagnosis.
Conclusions: Ketamine administration resulted in improved psychiatric symptoms both immediately and 24-hours post-administration in individuals with MDD and PTSD. By contrast,