1279. Revealing Circuits of Emotional and Congnitive Control in Intermittent Explosive Disorder

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Background: Basic brain-behavior studies to characterize the IED phenotype are sorely needed in order to identify valid therapeutic markers.
Methods: Individuals with IED and matched healthy controls completed: the color-word and threat-word Stroop, and passively viewed images of low vs. high valence and arousal. Data from an fMRI Point Subtraction Aggression Paradigm is forthcoming. fMRI-BOLD and trait anger responses were measured.
Results: the Stroop tasks revealed less optimized error-related activity in IED in two core task regions relevant to conflict monitoring, error processing and cognitive control and higher activation to threat words in thalamus and parahippocampus and lower activation in dorsomedial PFC. Two-way interactions between group x valence/arousal emerged in the right pallidum/thalamus and midcingulate (For all, puncorrected < 0.005). These interactions show abnormalities in PFC regulation and limbic reactivity in IED in both intensely pleasant and intensely negative emotional stimuli. Notably, across participants and across tasks, scores on trait anger correlated with activations in most of these regions of difference ($r>0.41$, $p < 0.005$), suggesting that trait anger in the IED group drove the task behavior and BOLD signal.
Conclusions: The emerging patterns in IED suggest a deficit in executive functions commonly observed in other disorders of self-control, while pointing to subcortical (instead of PFC) management of intense emotional stimuli. It appears that underlying these abnormalities in IED are their individual differences in trait anger, therefore, pointing to a two-pronged treatment strategy: strengthening cortical control in tandem with reducing or reappraising hyper-responsivity to emotionally arousing cues.
Keywords: intermitting explosive disorder, anger, aggression, fMRI, Stroop
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1280. Whole-brain White Matter Microstructure in Adults with Attention-deficit/hyperactivity Disorder

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Background: Recent diffusion tensor imaging studies have reported white matter (WM) abnormalities in adults with Attention-Deficit/Hyperactivity Disorder (ADHD). Such WM differences have been detected using region-of-interest analyses or whole-brain contrasts uncorrected for multiple comparisons, thus potentially inflating false positives. In this study we examined whole-brain WM in a substantial sample of adults with ADHD stringently corrected for multiple voxel-wise comparisons.
Methods: Diffusion-weighted images (3T, 3x3x3mm voxels, 64 diffusion directions) were acquired in 42 adults with ADHD and 67 healthy controls. The groups (age: M=31.4, SD=9.4 years; 43 F) were matched (all $p>0.5$) for age, sex, IQ, and head motion, which can elicit spurious group WM differences (Yendiki et al, 2014). Following standard tensor fitting, fractional anisotropy (FA), mean diffusivity (MD), and axial diffusivity (AD) were derived and analyzed via tract-based spatial statistics. Threshold-free cluster enhancement (TFCE) was the primary algorithm used to correct for multiple comparisons.
Results: Despite widespread uncorrected between-group differences, we found no significant differences for FA ($p>0.60$), MD ($p>0.48$), or AD ($p>0.43$) after TFCE correction. This result held when the two ADHD subtypes, combined (n=23) or predominantly inattentive (n=18), were analyzed separately (p min=0.34).
Conclusions: How to best select an optimal multiple comparisons correction method remains an open question that we will continue to address in these data. Nevertheless, our results highlight that studies examining WM alterations in ADHD must attend to potential confounders, particularly motion, and that positive findings must be interpreted with caution when uncorrected for multiple comparisons.
Keywords: ADHD, DTI, tract-based spatial statistics, false discovery rate
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1281. White Matter Integrity in Gambling Disorder

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Background: Gambling disorder (GD) is characterized by a preoccupation with gambling that can have significant negative consequences in daily functioning. Extensive research has been conducted on the treatment and clinical characteristics of GD, though little has focused on the comparisons of brain structure in those with GD with that of healthy control subjects. The aim of this study was to assess the integrity of white matter tracts in subjects with GD compared with healthy control subjects. In particular, we sought to conduct an analysis across all white matter tracts within the brain using DTI alongside recently validated and statistically powerful methods to ensure stringent corrections for multiple comparisons. We hypothesized there would be reduced fractional anisotropy (FA) in regions that regulated impulse control.
Methods: Eighteen individuals with GD underwent structural scanning in a 3T MR (mean age 47.2±13.2, 61.1% female). GD subjects were compared to a group of healthy controls (no current psychiatric disorders) (n=18, mean age 37.8±17.0, 72.2% female). These data underwent voxelwise analysis with permutation modeling and cluster correction.
Results: The individuals with GD had reduced fractional anisotropy compared to the healthy control groups in several pathways of the brain that contribute to neurocognitive and executive functioning deficits and difficulties with impulsivity.
Conclusions: The results suggest that GD is associated with extensive lower integrity of several brain white matter tracts. The diffusion abnormality closely resembles previous findings in individuals with substance addictions.
Keywords: gambling, imaging
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1282. Functional Connectivity Predicts Individual Differences in Impulsivity and Reward Sensitivity in Adolescents

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Background: Intrinsic connectivity networks (ICNs) are theorized to reflect the functional architecture of the brain at rest. Evidence suggests the strength of certain ICNs may predict impulsive decision-making, particularly ICNs including reward-related regions (e.g. nucleus accumbens), which has important implications for addiction research. Moreover, reward sensitivity may be predicted by individual differences in orbitofrontal cortex (OFC) volumes in adolescents across development. The present study investigated whether ICNs including OFC predicted self-reported reward sensitivity in adolescents.
Methods: 70 adolescents (ages 15-19, male=50%) completed a resting-state scan and measures of the behavioral approach (BAS) and inhibition systems (BIS). Group-level Independent Component Analysis was performed on resting data to extract 60 ICNs. ICNs that spatially overlapped with the OFC (≥100 voxels) were identified. Subject-level connectivity values were computed to reflect average connectivity strength between voxels within each ICN; connectivity values were entered into regression models to predict BIS/BAS subscales.