

Figure 1. IED show higher anger, impulsivity and lower self-control as compared to subthreshold IED and controls.

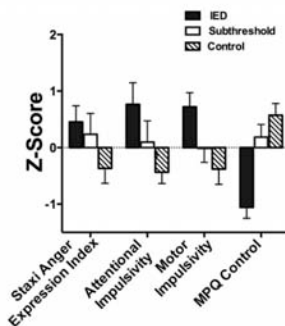
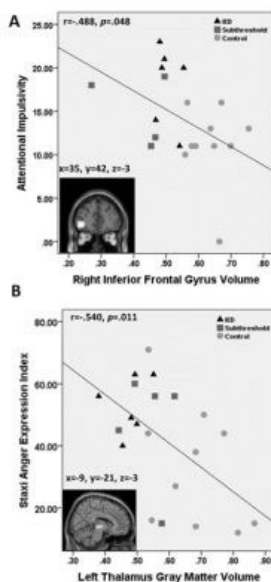


Figure 2. Correlations between A) Right IFG GMV and attentional impulsivity and B) left thalamus GMV and trait anger reactivity



**Keywords:** Aggression, MRI, intermittent explosive disorder, anger

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## 181. Brain and Behavior Response to Provocation in Intermittent Explosive Disorder

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**Background:** In the typology of aggression, intermittent explosive disorder (IED) is marked by disproportionate reactivity to provocation. We explored the behavioral and fMRI response to the Point Subtraction Aggression Paradigm (PSAP), which automatically and objectively measures aggressive response to provocation.

**Methods:** 30 males completed aggression questionnaires and behavioral PSAP [high-aggression (HA)=15, comprised of IED=9 and subthreshold-IED=6; matched low-aggression (LA)=15]. Eighteen males [HA=9 (IED=5; subthreshold-IED=4) and LA=9] performed the functional MRI-adapted PSAP.

**Results:** Compared to the LA, the HA group trended towards more aggressive presses on the behavioral PSAP [ $F(1, 28)=3.963, p=.056$ ]. Importantly, a linear contrast analysis between the three groups revealed a stepwise increase ( $p=.029$ ), with the IED group exhibiting the highest level of initial aggression. These behavioral results were correlated with physical aggression (Figure 1;  $r=.417, p=.022$ ). During fMRI, HA showed greater activation (whole-brain false-discovery-rate corrected two-tail cluster  $p < 0.05$ ) in portions of the bilateral precuneus, (Figure 2) during aggressive responding (relative to non-aggressive monetary responding) compared to controls.

**Conclusions:** PSAP-measured aggressive responding was elevated in individuals with IED. Hyper-reactivity of the precuneus during aggressive responding could provide insight into the neural underpinnings of reactive aggression.

Figure 1: A) Change in behavioral PSAP aggressive response relative to the number of provocations as a function of group shown over three trials within a single session. B) Correlations shown by group between physical aggression and aggressive responding on the PSAP.

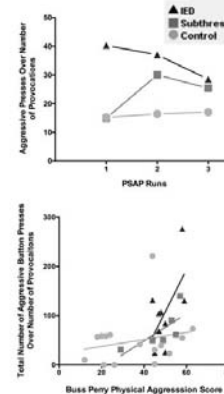
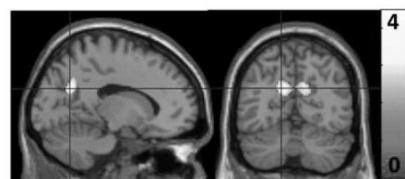


Figure 2. HA compared to LA during fMRI PSAP in aggressive, retaliatory responding, relative to non-aggressive responding (whole-brain false-discovery-rate [FDR] corrected two-tail cluster  $p < 0.05$ ), maximal voxel  $t(df 16) = 4.46$  at MNI  $x=-14, y=-64, z=26$



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