**ADHD and attentional control: Impaired segregation of task positive and task negative brain networks.**

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**Abstract**

Difficulty maintaining task focus in children with ADHD may relate to the coordinated, negatively correlated activity between brain networks that support the initiation and maintenance of tasks sets (task positive networks) and networks that mediate internally directed processes (i.e. the default mode network). Here, resting-state functional connectivity MRI between these networks was examined in ADHD, across development, and in relation to attention. Children with ADHD had reduced negative connectivity between task positive and task negative networks (p = .002). Connectivity continues to become more negative between these networks throughout development (7-15 years of age) in children with ADHD (p = .005). Regardless of group status, females had increased negative connectivity (p = .003). In regards to attentional performance, the ADHD group had poorer signal detection (d') on the continuous performance task (CPT) (p < .0001), more so on easy than difficult d’ trials (p < .0001). The reduced negative connectivity in children with ADHD also relates to their attention, where increased negative connectivity is related to better performance on the d’ measure of the CPT (p = .008). These results highlight and further strengthen prior reports underscoring the role of segregated system integrity in ADHD.