Response Inhibition, Response Execution, and Emotion Regulation among Children with Attention-Deficit/Hyperactivity Disorder


Abstract

Attention-deficit/hyperactivity disorder (ADHD) is associated with deficits in response inhibition, response execution, and emotion regulation. However, the nature of the associations among these deficits remains unclear. Thus, this study examines these associations using a multi-method design. One hundred sixty-six children (aged 5-13 years; 66.3% male; 75 with ADHD) completed two conditions (i.e., neutral and fear) of an emotional go/no-go task. Parasympathetic-based regulation was indexed via respiratory sinus arrhythmia (RSA), and sympathetic-based reactivity was indexed via cardiac pre-ejection period (PEP). Overall, children exhibited more difficulty with response execution (i.e., more omission errors, fewer correct go responses) and less difficulty with response inhibition (i.e., fewer commission errors, more correct no-go responses) during the fear condition than the neutral condition. Children with ADHD displayed more difficulty with response execution during the fear condition compared to typically developing youth. Additionally, children with ADHD displayed parasympathetic-based dysregulation (i.e., RSA increase from baseline) and reduced sympathetic-based reactivity (i.e., PEP lengthening) compared to typically developing youth across task conditions. In sum, children with ADHD demonstrate greater difficulty with response execution during emotionally salient contexts, as well as parasympathetic-based emotion dysregulation. Future work should examine these associations longitudinally with the aim of predicting impairment and treatment response in youth with ADHD.