Working memory and behavioral inhibition in children with attention-deficit/hyperactivity disorder (ADHD): an examination of varied central executive demands, construct overlap, and task impurity

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Abstract

The stop-signal paradigm is the premier metric of behavioral inhibition in contemporary attention-deficit/hyperactivity disorder (ADHD) research. The stop-signal paradigm's choice-reaction time component, however, arguably places greater demands on working memory processes (e.g., controlled-focused attention) relative to alternative inhibition metrics (i.e., go/no-go (GNG) tasks), and consequently obscures conclusions about inhibition and working memory deficits in affected children. The current study, therefore, aimed to determine whether shared variance between stop-signal behavioral inhibition and working memory performance in children with ADHD reflects overlap between the working memory and inhibition constructs or insufficient specificity of the stop-signal paradigm. Fifty-five children (8-12 years) with and without ADHD were administered established phonological (PH) and visuospatial (VS) working memory measures, as well as stop-signal and GNG tasks that vary with respect to demands on controlled-focused attention. Although working memory and GNG performance each uniquely predicted children's inattention, stop-signal task performance was not a significant predictor of unique variance in inattention, above and beyond variance associated with working memory. Collectively, these findings suggest that performance on the stop-signal task, compared to the GNG task, is confounded by greater demands associated with working memory and consequently reflects an impure estimate of the inhibition construct.