Phonological Working Memory Deficits in ADHD Revisited: The Role of Lower Level Information-Processing Deficits in Impaired Working Memory Performance

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Abstract

Objective:
The current study dissociates lower level information-processing abilities (visual registration/encoding, visual-to-phonological conversion, and response output) and examines their contribution to ADHD-related phonological working memory (PHWM) deficits.

Method:
Twenty children with ADHD and 15 typically developing (TD) children completed tasks assessing PHWM, visual registration/encoding, visual-to-phonological conversion, and response output.

Results:
Relative to TD children, children with ADHD exhibited deficient visual registration/encoding (d = 0.60), visual-phonological conversion (d = 0.56), and PHWM (d = 0.72) but faster response output (d = −0.66). Bias-corrected, bootstrapped mediation analyses revealed that visual registration/encoding, but not visual-to-phonological conversion, partially mediated ADHD-related PHWM impairments. In contrast, faster response output in children with ADHD served as a suppressor variable, such that greater PHWM deficits were observed in children with ADHD after controlling for their faster response output (d = 0.72 vs. 0.85).

Conclusion:
Results implicate both lower level (visual registration/encoding) and higher order (PHWM) impairments in ADHD. Implications for designing educationally relevant cognitive interventions are discussed.