The role of speed in ADHD-related working memory deficits: A time-based resource-sharing and diffusion model account.

Weigard A, Huang-Pollock C.


Abstract

Several recent commentaries suggest that, for psychological science to move beyond "homuncular" explanations for cognitive control, it is critically important to examine the role of basic and computationally well-defined processes (e.g. cognitive processing speed). Correlational evidence has previously linked slow speed to working memory (WM) deficits in ADHD, but the directionality of this relationship has not been investigated experimentally and the mechanisms through which speed may influence WM are unclear. Herein, we demonstrate in school-aged children with and without ADHD, that manipulating speed (indexed with the diffusion model) within a WM paradigm reduces WM capacity due to an increase in cognitive load, in a manner that is consistent with predictions of the time-based resource-sharing model of WM. Results suggest slow speed is a plausible cause of WM deficits in ADHD, provide a mechanistic account of this relationship, and urge the exploration of non-executive neurocognitive processes in clinical research on etiology.