Overlapping and Distinct Cognitive Impairments in Attention-Deficit/Hyperactivity and Autism Spectrum Disorder without Intellectual Disability.

Karalunas SL, Hawkey E, Gustafsson H, Miller M, Langhorst M, Cordova M, Fair D, Nigg JT.

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Abstract

Attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) are commonly comorbid, share genetic liability, and often exhibit overlapping cognitive impairments. Clarification of shared and distinct cognitive effects while considering comorbid symptoms across disorders has been lacking. In the current study, children ages 7-15 years assigned to three diagnostic groups:ADHD (n = 509), ASD (n = 97), and controls (n = 301) completed measures spanning the cognitive domains of attention/arousal, working memory, set-shifting, inhibition, and response variability. Specific processes contributing to response variability were examined using a drift diffusion model, which separately quantified drift rate (i.e., efficiency of information processing), boundary separation (i.e., speed-accuracy trade-offs), and non-decision time. Children with ADHD and ASD were impaired on attention/arousal, processing speed, working memory, and response inhibition, but did not differ from controls on measures of delayed reward discounting, set-shifting, or interference control. Overall, impairments in the ASD group were not attributable to ADHD symptoms using either continuous symptom measures or latent categorical grouping approaches. Similarly, impairments in the ADHD group were not attributable to ASD symptoms. When specific RT parameters were considered, children with ADHD and ASD shared impairments in drift rate. However, children with ASD were uniquely characterized by a wider boundary separation. Findings suggest a combination of overlapping and unique patterns of cognitive impairment for children with ASD as compared to those with ADHD, particularly when the processes underlying reaction time measures are considered separately.