Symptoms of ADHD Affect Intrasubject Variability in Youths with Autism Spectrum Disorder: An Ex-Gaussian Analysis

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Abstract

Increased intrasubject variability in reaction times (RT-ISV) is frequently found in individuals with autism spectrum disorder (ASD). However, how dimensional attention deficit/hyperactivity disorder (ADHD) symptoms impact RT-ISV in individuals with ASD remains elusive. We assessed 97 high-functioning youths with co-occurring ASD and ADHD (ASD+ADHD), 124 high-functioning youths with ASD only, 98 youths with ADHD only, and 249 typically developing youths, 8-18 years of age, using the Conners Continuous Performance Test (CCPT). We compared the conventional CCPT parameters (omission errors, commission errors, mean RT and RT standard error (RTSE) as well as the ex-Gaussian parameters of RT (mu, sigma, and tau) across the four groups. We also conducted regression analyses to assess the relationships between RT indices and symptoms of ADHD and ASD in the ASD group (i.e., the ASD+ADHD and ASD-only groups). The ASD+ADHD and ADHD-only groups had higher RT-ISV than the other two groups. RT-ISV, specifically RTSE and tau, was significantly associated with ADHD symptoms rather than autistic traits in the ASD group. Regression models also revealed that sex partly accounted for RT-ISV variance in the ASD group. A post hoc analysis showed girls with ASD had higher tau and RTSE values than their male counterparts. Our results suggest that RT-ISV is primarily associated with co-occurring ADHD symptoms/diagnosis in children and adolescents with ASD. These results do not support the hypothesis of response variability as a transdiagnostic phenotype for ASD and ADHD and warrant further validation at a neural level.