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TITLE:

Genetic and environmental influences on externalizing symptoms and aspects of executive function in middle childhood

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ABSTRACT:

Research has linked deficits in executive function (EF), such as shortfalls in inhibition and cognitive flexibility, with externalizing problems in childhood (e.g., Schoemaker et al., 2013, *Journal of Abnormal Child Psychology*, *41*, 457-471). However, quantitative genetic research examining associations between EF and externalizing problems in middle childhood is scarce. This study examined the genetic and environmental variation in externalizing symptoms and EF in a middle childhood sample. The sample comprised 710 twins (55.6% White, 28.3% Hispanic, 3.9% Black; 51.5% female; *M* age = 8.42 years, *SD* = 0.68) from the Arizona Twin Project (Lemery-Chalfant et al., 2019, *Twin Research and Human Genetics*, *22,* 681-685). Externalizing symptoms were assessed with

the Health and Behavior Questionnaire, and EF was assessed with the Conner's Continuous Performance Task (CPT; Conners, 2000, *Multi-Health Systems*) and the Eriksen Flanker Task (Eriksen & Eriksen, 1974, *Perception & Psychophysics, 16*, 143-149). Univariate ACE models indicated that additive genetics (A=.57), shared (C=.32), and non-shared (E=.11) environmental influences explained variation in externalizing symptoms, whereas an AE model best represented CPT (A=.49, E=.51) and Flanker (A=.48, E=.52) data. Our findings suggest the importance of additive genetic influences for these traits. However, phenotypic correlations were low for externalizing symptoms with CPT data (r= .14) and with Flanker data (r=.145), resulting in errors when attempting to fit bivariate models to examine covariation. Given robust associations between EF and ADHD in the literature, future directions include fitting a univariate model for ADHD symptoms and bivariate models of EF and ADHD symptoms in this sample.

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