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Do dopamine gene variants and prenatal smoking interactively predict youth externalizing behavior?

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Source

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Abstract

Externalizing behaviors (encompassing antisocial, impulsive, and substance use behaviors) are pervasive and impairing across a multitude of settings and developmental contexts. These behaviors, though often investigated separately, are highly comorbid. Prenatal tobacco exposure in interaction with various genetic influences has predicted later externalizing behavior, and recent evidence supports investigating sex differences in these patterns. In the current study, we extend this work by (a) examining two functional genetic markers in the dopamine system: the transporter gene (DAT1) and the dopamine receptor D4 gene (DRD4) in interaction with prenatal tobacco exposure to predict a latent composite of externalizing behavior and (b) testing whether these patterns differ by sex of youth in a community sample of adolescents (n=176). The relatively small sample is partially offset by high quality, multi-method prospective measurement. We assessed prenatal tobacco exposure using prospective repeated cotinine-corrected reports and externalizing behaviors were assessed utilizing multiple measures across three waves. The interaction between DAT1 (but not DRD4) and prenatal tobacco exposure was statistically significant in boys, and patterns appeared to differ by sex. Risk for externalizing behaviors for exposed boys increased linearly as a function of the 10r DAT1 allele. For exposed girls, there was a trend such that DAT1 heterozygotes had a marginally higher risk than homozygotes. This pattern was not explained by passive gene-environment correlation. Elucidating sex-specific pathways through which early adverse exposures and genetic susceptibilities contribute to externalizing behavior can inform early targeted prevention efforts for those children at highest risk.

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KEYWORDS:

ADHD, CD, DAT1, DRD4, Developmental psychopathology, Externalizing, Genexenvironment, ODD, PTE, Prenatal tobacco exposure, SES, VNTR, attention deficit hyperactive disorder, conduct disorder, dopamine receptor

D4, dopamine receptor gene, oppositional defiant disorder, prenatal tobacco exposure, socioeconomic status, variable number tandem repeat

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