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Sex Differences in the Biometrical Model for Substance Use Vulnerability

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ABSTRACT:

To date, numerous studies that have studied sex differences in substance use have found significant differences in the etiology of use trajectories in males and females. In this study, we investigated sex differences in the change of variance components over time for a general factor of polysubstance use dependence. We used data from the Colorado longitudinal twin studies (N=2,884). Analyses utilized transformed (ordinal) DSM dependence counts based on the number of DSM IV dependence criteria endorsed for each substance. Although DSM-IV dependence criteria scores range from 1 to 7, due to substantial skew and sparsity of extreme scores in a community twin sample, we binned the symptom counts into 0- “No symptoms” and 1- “Some Symptoms.” In addition, all substances outside of tobacco, alcohol, and cannabis were collapsed into one variable described as “other” and the substance with the highest dependence criteria endorsement was used. Across assessment waves (adolescence to adulthood) in females, the influence of the genetic variance component increased, and the influence of the shared environment component decreased. In males, we see the opposite trend, where the genetic variance component declines with age and effect of the shared environment peaks in early adulthood before declining slightly. In both males and females, the effects of nonshared environment increases gradually with age. This inconsistent contribution of genetic and environmental influence between males and females is indicative that sex differences in drug use are not wholly biological or sociocultural and their interactive effects lead to substantial phenotypic differences observed.

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