A multivariate behavior genetic investigation of dual-systems models of alcohol involvement

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Abstract

Objective:

Dual-systems models hypothesize that individuals who tend to be drawn to risky behavior and are low in self-control are at greatest risk for alcohol use disorder (AUD). Importantly, these models assume that behavioral approach tendencies and self-control are distinct. This study investigated hypotheses and assumptions central to dual-systems models.

Method:

Participants were 3,509 members of a national twin registry (58% female). Structured interviews assessed alcohol use and AUD symptoms. Self-report questionnaires assessed individual differences in approach tendencies, namely for general risky behavior (sensation seeking) and substance use (positive expectancies), and behavioral control. Regression models tested nonadditive, interaction effects on alcohol involvement, as proposed by the dualsystems model. Multivariate behavior genetic models investigated the incremental validity of these interaction effects and whether approach tendencies and behavioral control explain distinct variance in alcohol involvement.

Results:

In regression models, we found interaction effects consistent with the dual-systems model for women but in the opposite direction for men. After accounting for additive main effects in behavior genetic models, however, these interaction effects played a negligible role phenotypically and genetically. Further, sensation seeking and positive expectancies explained phenotypic and genetic variance in alcohol involvement that was distinct from behavioral control. Behavioral control, however, did not explain distinct variance in alcohol involvement.

Conclusions:

Contrary to dual-systems models, this study suggests that all of the variance in alcohol involvement explained by behavioral control is also shared with the tendency to engage in risky behavior (sensation seeking) and substance use (positive expectancies). Further, interaction effects central to dual-systems models failed to explain additional variance beyond basic main effects. Thus, more parsimonious models may better explain AUD.