

Genetic Interactions with Prenatal Social Environment: Effects on Academic and Behavioral Outcomes

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Abstract

Caspi et al. (2002, 2003), Guo et al. (2008), and Pescosolido et al. (2008) all claim to have demonstrated allele-by-environment interactions, but in all cases environmental influences are potentially endogenous to the unmeasured genetic characteristics of the subjects and their families. Thus, gene-gene interactions cannot be ruled out as an alternative explanation. Second, these studies have not deployed adjustments for multiple hypothesis testing always an issue, but particularly so for GE studies with multiple alleles and outcomes. Using data from the National Longitudinal Survey of Adolescent Health (Add Health), we address these limitations of previous studies by taking advantage of a natural experiment that randomizes a particular environmental influence ? fetal position, resulting in birth weight discordance within monozygotic twin pairs (validated with dizygotic twins as well). Whether or not we use corrections for multiple statistical tests, we find no support for any of the past research (including main effects of genes and birth weight) and, in fact, the only significant allele-birth weight interaction we reveal works in the /opposite/ direction of Caspi et al.'s classic finding on 5-HTT and maltreatment.