Prenatal programming of postnatal plasticity for externalizing behavior: Testing an integrated developmental model of genetic and temperamental sensitivity to the environment.

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Abstract

Although both gene- and temperament-environment interactions contribute to the development of youth externalizing problems, it is unclear how these factors jointly affect environmental sensitivity over time. In a 7-year longitudinal study of 232 children (aged 5-10) with and without ADHD, we employed moderated mediation to test a developmentally sensitive mechanistic model of genetic and temperamental sensitivity to prenatal and postnatal environmental factors. Birth weight, a global measure of the prenatal environment, moderated predictions of child negative emotionality from a composite of dopaminergic polymorphisms (i.e., DRD4 and DAT1), such that birth weight inversely predicted negative emotionality only for children with genetic plasticity. Negative emotionality, in turn, predicted externalizing behavior 4-5 years later, beyond genetic and postnatal parenting effects. Finally, birth weight moderated the indirect effect of dopaminergic genotypes on externalizing problems through negative emotionality, partially supporting a prenatal programming model. We discuss theoretical and empirical implications for models of environmental sensitivity.