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Breaking the link between genetic risk and externalizing problems through early prevention

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ABSTRACT:

Because genes and environments work together to influence health and development (i.e., the nature-nurture debate is dead), psychosocial interventions should attenuate genetic risk. The Family Check-Up (FCU) has been shown to increase children's effortful control, and reduce psychopathology and substance use. We hypothesized that FCU would mitigate genetic risk for aggression and frequency of alcohol use by increasing children's effortful control. The Early Steps RCT included 731 racially/ethnically diverse low-income children (49% females; M = 29.9 months at baseline) and their parents. Based on recent GWAS, polygenic risk scores for childhood aggression and adult alcohol use were formed. Children's effortful control was assessed at home visits, and parent-reported effortful control was obtained across middle childhood. Covariates included genetic ancestry PCs, age, sex, and socioeconomic status. Using an intent to treat design, FCU moderated the association between aggression polygenic risk and effortful control, such that polygenic risk was associated with lower effortful control in the control group (simple slope: $\beta = -.263$, SE = .053, $p < .001$) but not the intervention group (simple slope: $\beta = -.069$, SE = .051, *ns*). A similar pattern was found with genetic risk for alcohol use. Children at higher genetic risk for aggression and frequency of alcohol use had lower levels of effortful control. Importantly, FCU moderated both types of genetic risk by "repairing" children's "too low" effortful control. Findings support contemporary theories of gene-environment interplay, underscoring the importance of early prevention for mitigating both genetic and environmental risk of externalizing problems.

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