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TITLE:
The impact of genetic nurture on educational attainment: a meta-analysis

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Educational Attainment; genetic nurture; polygenic score; family-based study; meta-analysis

ABSTRACT:
Research on the intergenerational transmission of complex traits such as Educational Attainment (EA) is often confounded by the mixture of genetic effects and environmental effects as parents both transmit genes and create environments for their offspring. The

phenomenon of parental non-transmitted alleles affecting offspring outcomes is called "genetic nurture" (Kong et al. 2018). Genotyped families of parent-child pairs or mother-father-child trios allow us to identify the effect of genetic nurture by testing whether parents' genetics predict child outcomes over and above children's genetics. Here, we conducted the first meta-analysis to quantify the effect of genetic nurture on EA. Multilevel random-effects models and meta-regression were employed to (a) estimate the associations between parental genotype and child genotype with children's EA, (b) estimate the effect of genetic nurture on the associations between genotype and EA. We identified 52 estimates from 9 studies of genotyped families (N=19316). We found that child EA was predicted by both parental genotype (beta=0.20, 95% CI [0.16, 0.25]) and child genotype (beta=0.24, 95% CI [0.20, 0.28]). Genetic nurture had a small effect on child EA, as parental genotype predicted child EA over and above child genotype ($beta_{adjusted}$=0.08, 95% CI [0.06, 0.10]), while the effect of child genotype attenuated after controlling for genetic nurture ($beta_{adjusted}$=0.15, 95% CI [0.11, 0.20]). These results demonstrate a consistent effect of genetic nurture on child EA across studies and highlight the impact of intergenerational transmission through environmental pathways.

Reference:

Kong et al. (2018). The nature of nurture: Effects of parental genotypes. Science, 359(6374), 424-428.

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