Genetic study suggests there are variants that can increase chances of success in life

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A team of researchers from the U.S., the U.K. and New Zealand has found genetic variants that appear to confer success in life. In their paper published in *Proceedings of the National Academy of Sciences*, the group

describes their study and what they found.

Genetics plays a role in how well people do in life—some seem more naturally endowed with traits for success than others. In this new effort, the researchers report finding some of the genetic variants that appear to account for such differences.

To learn more about the role genetics plays in offering a propensity for success, the researchers undertook a genome-wide association study. They used data from five population-based longitude studies conducted in the U.S., the U.K. and New Zealand. Analysis of the data allowed the group to derive polygenic scores for over 20,000 people. These scores, the researchers explain, were used as a yardstick of sorts to measure and compare the individuals against one another regarding success factors. The team used school and career achievement along with income as benchmarks for success.

The researchers report finding that polygenic scores served as a useful benchmark—those with higher scores, they note, tended to do better in life. Using such an approach allowed the researchers to remove social status as a factor. Those with high polygenic scores tended to do better than their parents or siblings regardless of the social class in which they were raised. They also found that when comparing siblings, those with the higher polygenic scores generally became more successful.

The researchers suggest their findings show that just a few genetic variants can account for providing people with a leg-up in life. Those who have them tend to read earlier, succeed in school at an early age and then go on to have successful careers. But, they also note, such variants are no guarantee—they point out that having such variants is still just a small part of the puzzle. They estimate the variants account for just four percent of differences in social mobility.

More information: Daniel W. Belsky et al. Genetic analysis of social-class mobility in five longitudinal studies, *Proceedings of the National Academy of Sciences* (2018). DOI: 10.1073/pnas.1801238115

Abstract

A summary genetic measure, called a "polygenic score," derived from a genome-wide association study (GWAS) of education can modestly predict a person's educational and economic success. This prediction could signal a biological mechanism: Education-linked genetics could encode characteristics that help people get ahead in life. Alternatively, prediction could reflect social history: People from well-off families might stay well-off for social reasons, and these families might also look alike genetically. A key test to distinguish biological mechanism from social history is if people with higher education polygenic scores tend to climb the social ladder beyond their parents' position. Upward mobility would indicate education-linked genetics encodes characteristics that foster success. We tested if education-linked polygenic scores predicted social mobility in >20,000 individuals in five longitudinal studies in the United States, Britain, and New Zealand. Participants with higher polygenic scores achieved more education and career success and accumulated more wealth. However, they also tended to come from better-off families. In the key test, participants with higher polygenic scores tended to be upwardly mobile compared with their parents. Moreover, in sibling-difference analysis, the sibling with the higher polygenic score was more upwardly mobile. Thus, education GWAS discoveries are not mere correlates of privilege; they influence social mobility within a life. Additional analyses revealed that a mother's polygenic score predicted her child's attainment over and above the child's own polygenic score, suggesting parents' genetics can also affect their children's attainment through environmental pathways. Education GWAS discoveries affect socioeconomic attainment through influence on individuals' family-of-origin environments and their social mobility.

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