Intelligence Is in the Genes, but Where?

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You can thank your parents for your smarts—or at least some of them. Psychologists have long known that intelligence, like most other traits, is partly genetic. But a new study led by psychological scientist Christopher Chabris of Union College reveals the surprising fact that most of the specific genes long thought to be linked to intelligence probably have no bearing on one's IQ. And it may be some time before researchers can identify intelligence's specific genetic roots.

Chabris and David Laibson, a Harvard economist, led an international team of researchers that analyzed a dozen genes using large data sets that included both intelligence testing and genetic data.

In nearly every case, the researchers found that intelligence could not be linked to the specific genes that were tested. The results are published online in Psychological Science, a journal of the Association for Psychological Science.

"In all of our tests we only found one gene that appeared to be associated with intelligence, and it was a very small effect. This does not mean intelligence does not have a genetic component. It means it's a lot harder to find the particular genes, or the particular genetic variants, that influence the differences in intelligence," said Chabris.

It had long been believed, on the basis of studies of identical and fraternal twins, that intelligence was a heritable trait. The new research affirms that conclusion. But older studies that picked out specific genes had flaws, Chabris said, primarily because of technological limits that prevented researchers from probing more than a few locations in the human genome to find genes that affected intelligence.

"We want to emphasize that we are not saying the people who did earlier research in this area were foolish or wrong," Chabris said. "They were using the best technology and information they had available. At the time, it was believed that individual genes would have a much larger effect — they were expecting to find genes that might each account for several IQ points."

Chabris said additional research is needed to determine the exact role genes play in intelligence.

"As is the case with other traits, like height, there are probably thousands of genes and their variants that are associated with intelligence," he said. "And there may be other genetic effects beyond the single gene effects. There could be interactions among genes, or interactions between genes and the environment. Our results show that the way researchers have been looking for genes that may be related to intelligence — the candidate gene method — is fairly likely to result in false positives, so other methods should be used."

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