Intelligence genes: Elusive but real

Ten thousand hours.

That's how much practice is reportedly required to attain a master's level of expertise at a certain task whether it's the piano, cooking or chess. But even a ton of practice can't totally account for the variation between someone who is truly great at a task, and someone who has a mastery but no genius for doing the same. Professors David Hambrick, Gernanda Ferreira and John Henderson explained just how big the practice effect differed at Slate (emphasis mine):

> Cognitive psychologists Fernand Gobet and Guillermo Campitelli found that chess players differed greatly in the amount of deliberate practice they needed to reach a given skill level in chess. For example, the number of hours of deliberate practice to first reach "master" status (a very high level of skill) ranged from 728 hours to 16,120 hours. This means that **one player needed 22 times more deliberate practice than another player** to become a master.

What is left to fill in the difference? One's genes. The quest to find these genetic variations that make one a gifted athlete, musician or simply very smart have been going on for decades, but no one gene variant, or even a handful have been found that can explain the natural variation in intelligence between people.

The closest researchers have gotten was the discovery earlier this year of three genetic variants definitively linked to intelligence. But the maximum effect from the three combined was only 6 IQ points, a very underwhelming but robust finding. So, is the search for a 'smart' gene, or a 'musical' gene or an 'athletic' gene a 'fools errand' as Jessica Cussins suggests in the Huffington Post? Likely not.

There are many facets to 'smart.' One of the most important is memory. The ability to hold list items in short term memory, and the ability to convert those ideas to long term memory, essentially the basis of learning, are vital to intelligence. The transition process requires many neurotransmitters and brain structures. Any gene variant found to impact general intelligence could subtly tweak any of these myriad neurochemical processes.

And so, it's completely unsurprising that the search for these genes, even in the most rigorous and biggest studies, have yet to find a definite effect. There are likely thousands. The combination of those thousands of variants, and their interaction with a particular individual's environmental exposures, may yet explain the natural spectrum we see in human intelligence and why some people benefit from practice 22 times more readily as others.

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Additional Resources:

- Searching for the super genius genes, Genetic Literacy Project
- Genetics of intelligence: many, many genes with tiny effects, Genetic Literacy Project

- Is IQ in the genes? The PC hypocrisy of intelligence studies, Telegraph