Has history proved Eysenck right about genes and IQ?

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Hans J. Eysenck, one of the most famous and infuriating British psychologists of the 20th century, would have been 100 years old this month. While Eysenck pioneered behaviour therapy (paving the way for the acceptance of cognitive behavioural therapy) and argued for the necessity of evidence-based medicine and meta-analysis, in later years

his reputation was eroded by his hugely controversial writings on race and IQ and his largely unproductive forays into astrology, and research on smoking.

Eysenck's thoughts on IQ and genetics were also hugely unpopular. He argued that general intelligence (a broad measure of mental capacity) had a genetic basis, which is associated with a wide variety of life outcomes, including socioeconomic difference. When coupled with the race-IQ controversy, all of this was explosive stuff and Eysenck was regularly criticised for his views and even, on one occasion, physically attacked. In 1973, a female protester punched him in the face at a London School of Economics event.

Eysenck believed that intelligence was the most important concept in social sciences. So it's no surprise that this topic book-ended his scientific career: IQ was the focus of his first scientific paper in the late 1930s and his last book, Genius, in the late 1990s. However, a hundred years on from his birth, now is a good time to ask whether he was right about this particular point after all.

The latest evidence

In a recent paper, Hagenaars and colleagues reported on a study of over 100,000 people showing that there are shared genetic influences on intelligence, a range of diseases (including coronary artery disease, stroke, Alzheimer's disease, schizophrenia, autism and depression), as well as body mass index, infant head circumference and brain size.

These findings point to "pleiotropic" effects, that is, when one gene influences two or more seemingly unrelated traits. In this case, cognitive function, physical health and psychiatric disorders.

In this study, intelligence was measured in three ways: by verbal

numerical reasoning, memory and speed of reactions. These have little or nothing to do with traditional "book learning" measures of intelligence. Being good at cognitive tests is associated with many lifelong benefits.

These results support previous findings which show that being smarter is positively associated with greater longevity and negatively associated with many disease risk factors (such as high blood-pressure). It is also related to lower levels of physical illness and lower levels of some psychiatric disorders. The reasons for these associations remain unclear, but now the pieces of the jigsaw are starting to fall into place.

However, Hagenaars and colleagues' study shows that being smart has its downsides. The researchers found that some genetic variants associated with a university-level education were related to a higher genetic risk for schizophrenia, bipolar disorder and autism. Although associations between educational success and the last two disorders have been found before, the one with schizophrenia is new. Perhaps genius and madness do go together after all – something which Eysenck also believed and to which his book Genius was devoted to in 1996.

Hagenaars and colleagues' work is important, not so much for trumpeting the relevance and predictive power of cognitive tests, as well as reaction time measures of intelligence (which it does), but for revealing to us a number of significant things. First, mental and physical health are closely related – something that Eysenck believed all of his life. Second, the ability to do various cognitive tests may be a good indicator of general physical, as well as psychological well-being. And third, it should now be possible to determine what is truly caused by social disadvantage (for example, poverty) and what is properly to be attributed to common genetic influence on intelligence, health and wealth.

We can also now begin to examine the genes that give rise to physical

and psychological vulnerabilities. Once we know how they work, then we may get useful clues to how their effects can be modified. For example, it may be possible to counteract their negative effects and raise the level of specific abilities by education that is tailored to the individual rather than one that is one-size-fits-all. Also, we may find out more about the non-genetic environmental effects of poverty.

Such research would show something else of importance: it is a mistake to believe that genes are destiny. They are only destiny when we don't understand their actions and do nothing to prevent their negative outcomes.

Although Eysenck conducted one of the earliest statistical genetic studies on twins, and he worked closely with experts in genetics, he did very little empirical work on the association between genetics and intelligence. His influence came in the form of his ideas and writings – and from his championing of this most unpopular scientific cause.

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