DAILY MAIL (London)

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**HOW HALF OF YOUR** **INTELLIGENCE COMES FROM YOUR PARENTS**  
  
**BYLINE:** BY FIONA MACRAE SCIENCE CORRESPONDENT  
  
**LENGTH:** 467 words

IF you struggle with sums or can't finish a crossword, who should you curse Ð your teachers or your parents?

Well according to the latest evidence, you really should blame both.

Researchers have found that up to half of our intelligence (or lack of it) is inherited.

They examined the blood of more than 3,500 people from England and Scotland for half a million genetic markers Ð tiny changes in their DNA.

Analysis of these results and those of intelligence tests completed by the study's participants revealed that 40 per cent of the differences in 'crystallised-type intelligence', the ability to acquire knowledge and skills over the years, were in the genes.

So-called fluid-type intelligence, the ability to reason and think abstractly under pressure, was governed by genetics to an even greater extent.

Some 51 per cent of a person's ability to 'think outside the box' is down to DNA, the journal Molecular Psychiatry reports.

The research, made possible by a new type of genetic analysis pioneered by Peter Visscher of the Queensland Institute of Medical Research in Australia, points to numerous genes being involved.

Lead researcher Professor Ian Deary, of the University of Edinburgh, said: 'Individual differences in intelligence are strongly associated with many important life outcomes, including educational and occupational attainments, income, health and lifespan.'

However, he added that the study's results 'unequivocally confirm that a substantial proportion of individual differences in human intelligence is due to genetic variation'.

He hopes to unlock the secrets of those whose brains age well, with a view to helping others stay sharp as they get older.

'If we can find specific genetic contributions to people's experience of cognitive ageing, this can suggest the mechanisms by which people differ,' he said.

'We are studying genetics to find out how things work.'

Professor Deary added that those dealt a poor hereditary hand should not act as if their fate is sealed, as it is possible for people to overcome their intellectual inheritance.

The research may explain why humans have advanced so much further than chimpanzees, despite their genetic similarity.

Simon Underdown, an anthropologist from Oxford Brookes University, said: 'The devil is clearly in the detail.

It is not necessarily that we share the same genes Ð it is how they interact with other genes that controls intelligence.

'Human intelligence is a stunning product of our evolution and this brilliantly demonstrates that the genetic basis for our intelligence is not the result of a simple mutation in a single gene.

'It moves away from the old-fashioned idea that there may be a gene or a couple of genes for intelligence.

It looks as if there are lots and lots of genes across the chromosomes.'

The Guardian (London) - Final Edition

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**Now you know: intelligence may be in genes**  
**BYLINE:** Alok Jha Science correspondent  
  
**SECTION:** GUARDIAN HOME PAGES; Pg. 12  
  
**LENGTH:** 270 words

Genetic differences between people account for up to half of the variation in intelligence, according to a study of more than 3,000 individuals.

Intelligence runs in families, but no single genes have yet been identified that can be reliably linked to mental ability.

Instead researchers think many hundreds or thousands of genes could be involved, each with a small influence.

Professor Ian Deary of the University of Edinburgh led the research.

To test his idea, researchers looked at more than 500,000 locations in the genetic code of 3,511 unrelated adults.

They found that 40% of the variation in knowledge and 51% of the variation in problem-solving skills between individuals could be accounted for by differences in DNA.

The results were published yesterday in the journal Molecular Psychiatry.

Previous work on the environmental and genetic contributions to cognitive ability has been based on comparing intelligence in identical and non-identical twins, or studying it in people who were adopted.

In the study led by Deary, the conclusions were gleaned from direct testing of people's DNA.

Though the researchers now know the proportion of the variation in intelligence that is likely to be a result of genes, they do not know which genes are likely to be most important.

"It could be many thousands," said Deary.

"That could be a limitation to progress using this type of research."

Dr Simon Underdown, senior lecturer in biological anthropology at Oxford Brookes University, said: "This paper brilliantly demonstrates that the genetic basis for our intelligence is not the result of a simple mutation in a single gene."

The Times (London)

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**Scientists make better sense of the classic intelligence puzzle;   
There is not one, but hundreds of cleverness genes**  
**BYLINE:** Mark Henderson  
  
**SECTION:** NEWS; Pg. 12  
  
**LENGTH:** 577 words

Genetic factors explain about half the differences between individual people's intelligence, even though there is no single gene that has a large effect, a major study has shown.

Hundreds or thousands of genes, each of which has only a tiny effect by itself, add up to create a large genetic influence over different levels of general intelligence, according to a DNA study of more than 3,500 people.

The findings, from a team led by Ian Deary, of the University of Edinburgh, offer the strongest and most direct evidence yet for a strong genetic effect on intelligence.

However, the research also demonstrates that inherited factors work in concert with the environment.

Intelligence is not shaped by nature or nurture alone, but by both.

About 40 per cent of the variation in knowledge, or "crystalline-type intelligence", and about 50 per cent of differences in problem-solving skills, or "fluid-type intelligence", were explained by genetic factors.

"These new findings tell us that we have found genetic signals associated with people's intelligence differences," Professor Deary said.

"We have not found the actual genetic differences that cause some intelligence differences, but we now have evidence that some of the genetic causes are linked to those genetic factors that we tested.

The findings also leave a lot of room for environmental influences and for interactions between people's genes and their environments.

"It is a start to understanding the observed relationship between people's thinking skills and outcomes in life."

In the study, published in the journal Molecular Psychiatry, Professor Deary's team took DNA from more than 3,500 people from Edinburgh, Aberdeen, Newcastle and Manchester who were enrolled in four long-running population studies.

The results were checked against similar data from Norway.

The scientists then examined almost 600,000 points at which DNA commonly varies in "spelling", and compared the results against data from two types of intelligence test.

Although the technique did not identify any genetic variations that had an effect on intelligence by themselves, they found that broad patterns of genetic variation correlated closely with it.

Professor Deary said that the results could eventually provide insights into cognitive decline in old age.

"For us, the main practical problem is looking for environmental and genetic variants that are associated with thinking skills in old age," he said.

"If we can find out why some people's thinking skills age better than others then that would be a good start to finding mechanisms and providing clues to ameliorating age-related cognitive decline."

Robert Plomin, of the Institute of Psychiatry at King's College London, said: "We have known for decades that the heritability of IQ is about 50 per cent - it is the most studied trait in twin and adoption studies.

However, what is new in this paper is the application of a method that allows the estimation of heritability directly from hundreds of thousands of DNA markers."

Simon Underdown, senior lecturer in biological anthropology at Oxford Brookes University, said: "Human intelligence is a stunning product of our evolution and this paper brilliantly demonstrates that the genetic basis for our intelligence is not the result of a simple mutation in a single gene.

Rather the diverse range of genes that appear to influence our ability to think must have been actively selected for over hundreds of thousands of years."