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Brain drain: Are we evolving stupidity?

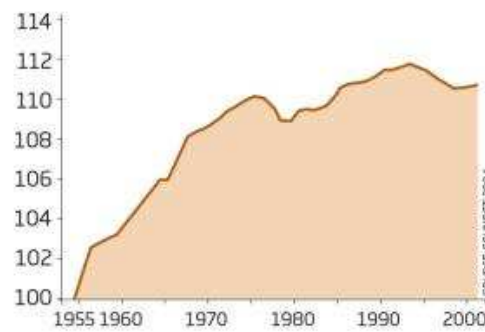
20 August 2014 by [Bob Holmes](#)

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A score to settle

The rise of average IQ scores of military conscripts in Norway has slowed and started to reverse. Similar patterns are seen in a few other countries.



A score and settle

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Has our century-long rise in intelligence gone into reverse? (Image: Oliver Jeffers)

We've got smarter and smarter in the 20th century, but now there are signs that IQs have begun to fall in countries such as the UK and Australia

IN DENMARK, every man is liable for military service at the age of 18. Nowadays, only a few thousand get conscripted but all have to be assessed, and that includes doing an IQ test. Until recently, the same one had been used since the 1950s. "We actually have the same test being administered to 25 to 30,000 young men every year," says [Thomas Teasdale](#), a psychologist at the University of Copenhagen.

The results are surprising. Over this time, there has been a dramatic increase in the average IQ of Danish men. So much so that what would have been an average score in the 1950s is now low enough to disqualify a person from military service, Teasdale says.

The same phenomenon has been observed in many other countries. For at least a century, each generation has been measurably brighter than the last. But this cheerful chapter in social history seems to be drawing to a close. In Denmark, the most rapid rises in IQ, of about 3 points per decade, occurred from the 1950s to the 1980s. Scores peaked in 1998 and have actually declined by 1.5 points since then. Something similar seems to be happening in a few other developed countries, too, including the UK and Australia.

So why have IQ scores been increasing around the world? And more importantly, why does this rise now seem to be coming to an end? The most controversial explanation is that rising IQ scores have been hiding a decline in our genetic potential. Could this possibly be right? Do we face a future of gradually declining intellectual wattage?

There's no question that intelligence – as measured by IQ tests, at least – has risen dramatically since

the tests were first formalised a century ago. In the US, average IQ rose by 3 points per decade from 1932 to 1978, much as in Denmark. In postwar Japan, it shot up by an astonishing 7.7 points per decade, and two decades later it started climbing at a similar rate in South Korea. Everywhere psychologists have looked, they have seen the same thing.

This steady rise in test scores has come to be known as the "Flynn effect" after [James Flynn](#) of the University of Otago in New Zealand, who was one of the first to document the trend. Much has been written about why this has been happening. There may be a cultural element, with the rise of [television, computers and mobile devices](#) making us better at certain skills. The [biggest IQ increases involve visuospatial skills](#). Increasing familiarity with test formats may also play a role.

The general view, though, is that poor health and poor environments once held people back, and still do in many countries. Wherever conditions start to improve, though, the Flynn effect kicks in. With improved nutrition, better education and more stimulating childhoods, many people around the world really have become smarter.

We have, after all, changed in other ways: each generation has been taller than the previous one, probably because nutrition has improved. So although height is thought to have an even larger genetic component than intelligence – taller parents tend to have taller children – the environment matters too.

If better nutrition and education have led to rising IQs, the gains should be especially large at the lower end of the range, among the children of those with the fewest advantages in their lives. Sure enough, that's what testers usually see. In Denmark, for example, test scores of the brightest individuals have hardly budged – the score needed for an individual to place in the top 10 per cent of the population is still about what it was in the 1950s. "It was the bottom end that was moving up. The top end hardly moved at all," says Teasdale.

If social improvements are behind the Flynn effect, then as factors like education and improved nutrition become common within a country their intelligence-boosting effects should taper off, country by country. "I've been predicting for some time that we should see signs of some of them running out," says Flynn. And those signs are indeed appearing. It seems we are seeing the beginning of the end of the Flynn effect in developed countries.

Similarly, the [increases in height are also tapering off](#). But IQ scores are not just levelling out but appear to be declining. The first evidence of a small decline, in Norway, was reported in 2004 ([see chart](#)). Since then a series of studies have found similar declines in other highly developed countries including Australia, Denmark, the UK and Sweden. The latest evidence, reported last year, comes from the Netherlands and Finland ([Intelligence](#), vol 41, p 817). Should we be worried? Not according to Flynn and Teasdale. The evidence remains sparse and [sometimes contradictory](#), and could just be due to chance.

Underlying decline?

Even if they are not down to chance, such small declines could be attributable to minor changes in social conditions such as falling income or poorer education, which can easily be reversed, says Flynn. But these are invented hypotheses for a very small phenomenon, he points out. "You'd want to be pretty certain that phenomenon was actual before you scratch around too hard for causes."

There is a more disquieting possibility, though. A few researchers think that the Flynn effect has masked an underlying decline in the genetic basis of intelligence. In other words, although more people have been developing closer to their full potential, that potential has been declining.

Most demographers agree that in the past 150 years in Western countries, the most highly educated people have been having fewer children than is normal in the general population. The notion that less educated people are outbreeding others is far from new, as is the inference that we are evolving to be less intelligent. It's even the theme of a 2006 film, [Idiocracy](#).

"This is a claim that has been made for over a century now, and always with the most horrific prediction of what might happen if we don't stop it," says [Bill Tucker](#), a historian of psychology at Rutgers University in Camden, New Jersey. This idea led to [the extensive eugenics programme in the US](#), with its forced sterilisations, which in turn helped inspire the "purity" policies of Nazi Germany.

This unpleasant history, though, doesn't mean there is no genetic decline, some argue. Richard Lynn of the University of Ulster, UK, a psychologist whose work has often been controversial, has [tried to calculate the rate of decline](#) in our genetic potential using measured IQ values around the world in

1950 and 2000. His answer: a bit less than 1 IQ point, worldwide, between 1950 and 2000. If the trend continues, there would be another 1.3 point fall by 2050. Even if he is right – and it's a big if – that is a tiny change compared with the Flynn effect. Would small declines like this even matter?

Yes, argues Michael Woodley, a psychologist at Free University of Brussels (VUB) in Belgium. This kind of evolution would shift the bell curve of intelligence, he claims, and a small shift can lead to a big drop in the number of high scorers. For example, if mean IQ fell from 100 points to 97, it would almost halve the number of people who score above IQ 135. "It's a leverage effect," Woodley says.

Would this really matter? People who score highly in IQ tests [are not always the most successful in life](#). In any case, with so many confounding factors, it is far from clear whether the "evolving to be stupid" effect is real. For example, it has been suggested that caesarians allow [more bigger-brained babies to survive](#) than in the past.

A definitive way to settle this issue would be to look at whether gene variants associated with higher IQs are becoming less common. The trouble with this idea is that so far, despite huge effort, we have failed to find any specific gene variant linked to significantly higher IQs in healthy individuals.

"Boy, a lot of investigators have spent a lot of time looking for that stuff, with some pretty big samples and sophisticated methodology," says [Ronald Yeo](#), a psychologist at the University of New Mexico in Albuquerque. "Of course it doesn't mean that there aren't genes that are important. It's just there are so many of them and they each have so little effect."

Yet Woodley thinks his team has found clear evidence of a decline in our genetic potential – and he claims it is happening much faster than Lynn's calculation suggests. Instead of relying on fertility estimates, Woodley looked at a simple measure: reaction time. Quick-witted people, it turns out, are exactly that: smarter people tend to have quicker reaction times, probably because they process information more quickly.

Back in the 1880s, the polymath Francis Galton measured the reaction times of several hundred people of diverse social classes in London. A few years ago, Irwin Silverman of Bowling Green State University in Ohio noticed that the reaction times Galton recorded – an average of about 185 milliseconds between seeing a signal and pushing a button – were quite a bit quicker than the average of more than 250 milliseconds in modern tests, which began in the 1940s.

Woodley's team reanalysed Silverman's data, factoring in the known link between reaction time and intelligence. When they did this, they found that reaction times had indeed slowed over the century, by an amount corresponding to the loss of one full IQ point per decade, or more than 13 points since the Victorian era ([Intelligence, vol 41, p 843](#)).

Critics have been quick to attack Woodley's analysis, arguing that Galton may not have measured reaction times in the same way as later investigators. If Galton's apparatus had a button with a shorter range of motion, for instance, then he would have measured shorter reaction times. What's more, Silverman points out that there is no obvious downward trend in the post-1940 data, as there should be if Woodley is right.

In [a detailed response published in June](#), Woodley maintains that today's brains remain slower even after accounting for all these other explanations. But even if he's right about reaction times, the correlation between IQ and reaction time is not an especially strong one: reaction time explains only about 10 per cent of the variation in IQ.

"Probably every generation moans about the new generation being less intelligent, and every upper crust moans about the lower classes out-breeding them," says [Kevin Mitchell](#), a neurogeneticist at Trinity College Dublin in Ireland. "The basic premise is that IQ levels are dropping. And I don't see any evidence for that, which is why I find the whole debate a bit odd."

Trouble ahead

The coming decades should provide a definitive answer. If what we are seeing in countries like Denmark is merely the end of the Flynn effect, IQ scores should stabilise in developed countries. If Woodley and his colleagues are right, we should see a continuing decline.

Even if we are evolving to be more stupid, it is far from clear whether we need to worry about it. Flynn thinks the problem may just take care of itself, as societal improvements such as better healthcare and more promising employment options bring down fertility rates in every stratum of society.

But don't breathe a sigh of relief just yet. In the longer term, there may be an even more fundamental threat to our intelligence. We humans mutate fast – each of us has 50 to 100 new mutations not present in our parents, of which a handful are likely to be harmful, says [Michael Lynch](#), an evolutionary geneticist at Indiana University in Bloomington. In the past, harmful mutations were removed as fast as they appeared, because people unlucky enough to inherit lots of them tended to die young, before they had children. Now, things are different. Fetal mortality, for example, has declined by 99 per cent in England since the 1500s, Lynch says.

This means that populations in developed countries are accumulating harmful mutations. Over tens of generations, Lynch has calculated, this will lead to a large drop in genetic fitness (*PNAS*, vol 107, p 961). With so many genes contributing to brain function, such a decline might well drag down our brainpower, too. The only way to stop that might be to tinker with our genomes. Given our ignorance about the genetic basis of intelligence, and the ethical complexities, that is a long way off.

Coming back to the short-term, though, there is an obvious option for those concerned about intelligence levels. "If you're worried about it, the answer is what the answer has always been," says Mitchell. "Education. If you want to make people smarter, educate them better. That won't make everybody equal, but it will lift all boats."

This article appeared in print under the headline "Stalled"

Leader: ["It would be stupid to ignore a drop in human intellect"](#)

Are humans evolving to be dumber? A few researchers argue that this has happened over the past century or so (main story), but it could have been going on for much longer. One thing is certain: [our brains have been shrinking for at least 10,000 years](#). An average European woman today, for example, has a brain about 15 per cent smaller than that of her counterpart at the end of the last ice age ([see diagram](#)).

It has been suggested that with the rise of agriculture and towns, and increased division of labour, people could survive even if they weren't as smart and self-sufficient as their hunter-gatherer ancestors. But smaller doesn't necessarily mean wimpier, says [John Hawks](#), an anthropologist at the University of Wisconsin in Madison. Brains are costly to operate, so evolution is likely to favour increased efficiency. Modern brains might do just as much with a smaller package, Hawks thinks.

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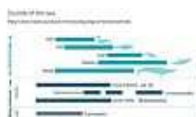
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