The danger of reading too much into IQ tests, and the crucial cognitive skills they don't measure

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Many people object to intelligence tests. Some say IQ test scores are too often abused. They says it's unfair that when children "fail" these tests it

can mean they receive a worse secondary education than their more successful peers—sentencing them to a lifetime of disadvantage.

Some object to IQ tests for quite personal reasons and remember how stressed they were by sitting a test. Many doubt their result was a fair reflection of their future potential. But how useful are IQ tests really—and what skills and qualities do they miss?

More than 30 years ago, I discovered a half-forgotten, unique archive of more than 89,000 IQ-type tests from 1932. This comprised a near-complete national sample of Scottish children born in 1921 who—at the time—would have been about 76 years old.

My aim was simple: to find local people to match with the archive and compare their current mental ability with their test result from 1932. A picture quickly emerged linking lower IQ scores with earlier than expected age at death and earlier onset dementia.

The second world war yielded some strong unexpected anomalies. Young men with higher childhood IQ scores more often died on active service. Girls with higher scores more often moved away from the area.

I cycled around Aberdeen to learn more about its social history, becoming familiar with the primary schools where the children had sat their tests in 1932. Average IQ scores often differed substantially between schools. Those pupils attending schools in overcrowded districts tended to perform less well on the test.

Our later research showed that people with higher IQ were engaging in more intellectually stimulating activities, such as reading complex novels or learning musical instruments. But we can't know whether having a high IQ leads people to seek out such activities or whether intellectually curious people develop higher IQ because they engage in cognitively

complex tasks throughout life.

And that's an important question. People from poorer backgrounds, such as the disadvantaged neighborhoods in Aberdeen, may not have the opportunity to pursue intellectual interests due to a lack of time and resources.

To better inform my work, I sought out local residents with long experience of teaching in Aberdeen. Their views were echoed by current workers in public health and psychology.

Teachers warned me not to forget that IQ tests have been used over the years to advance "scientific racism" and that they feared that before too long, right-wing advocates of IQ testing would want to use these rediscovered Scottish data to search for the genetic basis of intelligence. Alarmed and now forewarned, I looked back at the reasons for undertaking the 1932 survey of the mental ability of Scottish schoolchildren.

The survey was funded by the Eugenics Society (eugenics is the science of improving the human race through the selection of "good" hereditary traits) with some help from the Rockefeller Foundation. Their shared priority was to show a link between large family size and below average mental ability.

At the time, this negative relationship between a mothers' IQ and having children was easy to show. But post-1945 educational reforms, which led to more girls completing higher education, produced much more complex relationships between maternal IQ, educational achievements, age at first childbirth and lifetime fertility.

This fed into contemporary public concerns that the average mental ability of the general population was lowered by the loss of so many

young men of presumed above average ability during the first world war war. Newspapers argued that schoolboys would need to be assessed and selected to better educate those most likely to benefit.

This only goes to show that while IQ tests can tell us something about academic success or dementia risk, they miss a lot of a nuance. There's no denying they have long been used for murky reasons—often as an excuse to direct less funding to certain types of school, thereby creating a two-tier system.

The majority of children, those who do not take or pass IQ-style entrance exams to private or grammar schools, will have many qualities not measured on an IQ test. They may also just be late developers.

What IQ tests don't measure

So what do IQ tests miss? Research suggests that IQ scores rose by about 3 points per decade over much of the 20th century, but may have dropped over the past 30 years or so.

Some experts argue this reflects changes in the school curriculum or maybe just the complexity of modern life. The acquisition of "content knowledge" (reading and memorizing) once formed a cornerstone of public examinations and is related to IQ test performance.

We know for example that working memory is related to IQ test performance. But research has since uncovered that self-discipline is actually better predictor of exam results than IQ.

Nowadays, children in the west are taught collective scientific problem-solving, combined with interpersonal skills and teamwork, which requires less memorization (rote learning). This may actually make students less likely to score highly on IQ tests, even though these

methods are helping humanity as a whole get smarter. Knowledge keeps growing, often as a result of giant research collaborations.

This type of "procedural learning" leads to mature self-awareness, emotional stability, recognition of the thoughts and feelings of others and an understanding of an individual's impact on the performance of a group. Critically, a lack of these skills can hinder rational thinking. Research shows that when we ignore or fail to understand our feelings, we are more easily manipulated by them.

High IQ doesn't necessarily protect against bias or error either. In fact, research shows that people with high IQ can be particularly vulnerable to mistakes such as spotting patterns even when there aren't any, or they are irrelevant.

This may lead to confirmation bias and difficulty giving up on an idea, solution or project even when it is no longer working. This can also get in the way of rational reasoning. But such weaknesses are missed by IQ testing.

Many great leaps in human ingenuity were driven by creativity, collaboration, competition, intuition or curiosity rather than just individual IQ. Take Albert Einstein, who is often hailed as a genius.

He never took an IQ test, but people are constantly speculating about his IQ. Yet he often credited curiosity and intuition) as the core driving forces of scientific success—and these are not qualities measured by an IQ test.

The ethos of a modern school is rightly not driven by a preference to educate only those children who on selection meet a minimum standard on a mental test. Schools acknowledge that educational outcomes are not determined solely by any innate ability but are equally affected by all

prior experiences that affect emotional competences, motivation, intellectual curiosity, insightfulness and intuitive reasoning.

When local participants in the 1932 survey were interviewed in late life, they spoke warmly of their schooldays—particularly about friendships. They rarely mentioned their education though. The learning of content knowledge, with threats of physical punishments, simply weren't well regarded. Some remembered sitting the IQ test in 1932 and were pleased most schools no longer test children that way.

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