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IQ tests: Can you improve your score by practicing?

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Most adults never have to take an IQ test. But tests for assessing students' cognitive abilities, such as the cognitive ability test (Cat), are used in schools around the world. These tests are very similar to IQ tests.

Taking them may be a pain for kids. Possibly, it's an even bigger pain for parents.

Just for a moment, put yourself in the shoes of a parent whose child's overall Cat score turns out to be below average. A flock of unpleasant questions may pop into your mind. Does that mean they won't get into a top university? And what about their career?

Some time after all this rumination, another thought may cross your mind. If performance on these tests matters, is it possible to improve it the way we improve on anything else, that is, by practice?

The science reveals that, whether you're a child or an adult, it is possible to improve your performance on cognitive tests. That said, it won't make you any smarter.

The long history of testing

Standardized testing has a long history in education and is sometimes used by companies as part of hiring. The most notable example is probably the Chinese civil service examination. This extremely tough assessment was introduced during the Sui dynasty (AD581–618) to select the candidates for the imperial bureaucracy, a job of high prestige.

Not much has changed. Just like imperial China, nowadays, educational institutions worldwide test students on a variety of skills, including both subject knowledge and cognitive abilities. In the US today, the SATs exams are used to filter out applications to prestigious universities. Testing students on subjects like math, literacy and science makes as much sense as much today as 14 centuries ago.

It is a way to determine if students are learning the skills needed to be cultured, responsible and productive citizens. Less obvious, and more

controversial, is what school cognitive testing brings to the table.

Cognitive tests are usually a set of tasks assessing a variety of intellectual capabilities. For instance, the latest version of the Cat measures four cognitive abilities: verbal reasoning, nonverbal reasoning, quantitative reasoning and spatial reasoning.

People who do well on a particular cognitive task are more likely to do well on other cognitive tasks. Cognitive tasks are therefore linked to each other and do not tap into acquired knowledge. So humans must possess a general mental ability to resolve unfamiliar intellectual problems unrelated to a subject. This is what we call intelligence.

Your score on a comprehensive cognitive test is usually referred to as IQ. But IQ scores are just proxies for people's intelligence. Crucially, these scores are closely linked to academic performance.

In fact, IQ is by far the best predictor of academic achievement and an important predictor of professional success. Cognitive testing is, therefore, a useful and fairly reliable way to predict real-life outcomes.

Practice makes perfect, not smarts

A good performance on cognitive tests is a sign of intelligence. Being intelligent is useful to achieve life goals.

Performance on cognitive tests does improve with practice. For example, a study found that just taking a common nonverbal reasoning test twice increases scores by roughly the equivalent of eight IQ points.

So it is likely that a child taking a test such as the Cat a second time will perform better than the first time. Several rounds of repeated testing yield similar or even larger effects across several cognitive tests,

although a plateau is to be expected.

Likewise, adults practicing the same intelligence test several times may improve their performance by learning the logic behind the questions. For this reason, standardized tests, such as the one used by Mensa, are not publicly available.

Still, improving your score by practicing would not prove that your intelligence has increased. As seen, cognitive tests have been designed to measure intelligence by exposing people to new material.

If you have the opportunity to familiarize yourself with a cognitive test beforehand, the test score will, to a certain extent, measure your expertise in performing the test rather than your intelligence. That is, practicing on a cognitive test essentially makes the test results un-interpretable.

To support the claim that training on particular cognitive tasks makes people more intelligent, you need to show that people show improvements on cognitive and academic tasks unrelated to the trained tasks.

The idea of enhancing intelligence via training on cognitive tasks is at least a few decades old. However, the evidence points in the opposite direction. While people consistently improve on trained tasks (or similar tasks), it has no effect on unfamiliar tasks to do with intelligence.

Training your child to perform well on the Cat or any other cognitive test may have practical purposes. For example, some grammar schools seem to use the Cat in their selection process. It may be a boost for the child's confidence, too.

That said, intelligence is untrainable.

Still, academic and work skills aren't. While high intelligence is a significant advantage, school and professional success does not entirely rely on it. Hard work, social class, personality, curiosity, creativity and even luck often have a big effect on individual lives.

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