

IQ Scores of Teens May Change Over Time

Study Shows IQ Scores Can Fluctuate Over the Course of Several Years

By Matt McMillen

FROM THE WEBMD ARCHIVES 

Oct. 19, 2011 -- A teen's IQ is not set in stone, according to a study published today in *Nature*. Instead, the standard measure of intelligence -- often used to predict future success -- can fluctuate dramatically.

"The results indicate that an early developer doesn't necessarily continue to excel; and a late developer can catch up. Educators already know this," study researcher Cathy Price, PhD, tells WebMD in an email. "The more relevant point is that, if IQ changes are real (as we claim), they are not measuring a capacity to do well. They are measuring how well the individual is doing at a fixed time."

Price, a professor at the Wellcome Trust Centre for Neuroimaging at University College London, and colleagues, tested 33 "healthy and neurologically normal" adolescents aged 12 to 16. Their IQ scores ranged from 77 to 135, with an average score of 112.

Four years later, the same group took another IQ test. While the average score of 113 was only one point greater than the previous test, the range of scores was quite different: 87 to 143. Individually, the results were quite striking, as participants showed as much as an 18-point drop in IQ, while others shot up as high as 21 points.

The researchers also broke down the scores by verbal IQ, a measure of language, arithmetic, general knowledge and memory, and performance IQ, which focuses on visual problem solving. Scores fluctuated by as much as 23 points in verbal IQ and 18 in performance IQ.

"A change in 20 points is a huge difference," Price says. "If an individual moved from an IQ of 110 to an IQ of 130, they move from being 'average' to 'gifted.' And if they moved from 104 to 84, they move from being high average to below average."

Overall, the researchers report, one-fifth of the kids tested moved from one IQ category to another, from average to below average, for example.

Brain Changes

Each of the participants also underwent brain scans -- a combination of functional and structural imaging -- at the time that they were given the IQ tests.

Decreases or increases in the density of gray matter in a region associated with speech corresponded with better or worse verbal test scores. Similar changes were noted in the area of the brain tied to hand movement among students whose performance IQ scores had shifted.

Those scans, Price says, confirm the researchers' findings that the changes in test scores are likely real.

"When we saw the fluctuations in [IQ test] performance, we were concerned that this was measurement error (e.g. differences in concentration on the different testing times)," Price says. "However, then we found that the degree to which verbal or nonverbal IQ changed was mirrored by changes in brain structure."

Capacity for Change

One important finding, Price points out, is that teens, whether they test high or low, appear to have an equal capacity to change -- for better or for worse.

"It was NOT the case that the young low performers got better and the young high performers averaged out," Price says. "If a teenager has poor nonverbal skills, this doesn't mean that they don't have the potential to improve these skills. Likewise, if a teenager has good nonverbal skills, this does not mean that they will maintain these skills without practice."

Price is unable to say with certainty what accounts for such changes. Some teens may simply be early or late bloomers. Brain development can also be influenced by what students focus on in their studies. If they neglect verbal-oriented learning, for instance, their scores may reflect that.

"What we don't know is what occurred first, the change in the [brain] structure or the change in skills," Madison Berl, PhD, tells WebMD in an email.

Berl, a pediatric neuropsychologist at Children's National Medical Center in Washington, DC, who was not involved in the study, says that the research is encouraging in two ways.

"I would say that like the authors point out, IQ is not as rock-solid stable by an early age as most people believe, which is good news in terms of there being an opportunity to continue to learn and gain skills," Berl says. "[And] it is another step in the possibility that sophisticated neuro-imaging tools may be used to monitor [mental] development."