

The Nature and Measurement of Intelligence

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“Intelligence” is one of those concepts that we all pretty much understand and yet none of us can easily define. We can describe the characteristics of an intelligent person or think of words that mean the same as intelligence, and yet we're frustrated in our attempts to say exactly what intelligence is (and isn't). This lack of universal agreement on what intelligence is creates controversy over how best to measure it. Rather than try to resolve the controversies, I will try to summarize the areas where there is general agreement.

When we measure intelligence, we are not measuring one discreet quality but rather a collection of skills that combine to form “intelligence”. For this reason, one number (such as an I.Q. score) is not the best way to describe a person's intelligence. Most modern intelligence tests are actually a collection of subtests that each measure intelligence in a different way. Although the combined scores will yield an overall I.Q. score, an examination of each subtest score will often yield valuable information about a student's strengths and weaknesses. Subtest scores are sometimes grouped together to form Verbal, Nonverbal, Crystallized, Fluid, or other types of I.Q. scores. Very high or low scores in these areas suggest a strength or weakness in certain “styles” of problem solving.

A child's intelligence is not absolutely determined at the moment of birth. Experiences during a child's developmental years may affect the IQ score. Sadly, the affects of illness, injury, or neglect are more clearly evident than the effects of an enriching environment. Parents should provide a language rich and stimulating environment to young children and safeguard against injuries or illness. School psychologists too often see the results of head trauma, drug use, serious illness or other issues that tend to lower intelligence.

Ordinarily, a student's intelligence will remain pretty stable throughout their lifetime. IQ scores may vary some during the developmental years but they typically stabilize during the middle school years. Of course, a certain amount of variability between IQ test scores over time is to be expected due to the imperfect nature of intelligence tests.

Over the past several decades, researchers have focused on how culture affects intelligence and how it is measured. Ideally, an intelligence test would yield accurate scores regardless of the student's race, culture or language. Likewise, an intelligence test should not simply measure “what a person knows”. It is generally accepted that intelligence and knowledge are not the same thing. These concerns have resulted in a variety of intelligence tests that reduce or even eliminate language or pictures that may introduce cultural bias. Such “culture free” intelligence tests typically have fewer subtests than a more general intelligence test.

Modern intelligence tests do a pretty good job of estimating a person's true intelligence, but there are some things they aren't intended to measure that have a profound impact on daily performance. Chief among these is motivation or "desire". A bright student who lacks ambition will often produce poorer quality work than their "average" classmate. Also, intelligence tests do not measure creativity, imagination, or artistic talent. These skills are too subjective to be assessed with a conventional test. Finally, interpersonal skills are independent of intelligence. There are many "bright" students who do not perform well in school because they have trouble relating to others or working cooperatively.

On most intelligence tests, an IQ score of 100 is perfectly average. Since no IQ test is perfect, it is more proper to think of IQ scores between 90 and 110 as being in the average range. Certainly, students who earn higher scores are probably smarter than students who earn lower scores, but a difference of a few points is insignificant. An IQ score of 95 is every bit as "average" as a score of 105.

In summary, an IQ score is an important predictor of student success, but too much importance should not be attached to that one score. Intelligence tests are imperfect and at best present only an estimate of intelligence. School success is also affected by a variety of factors that can not be measured by an intelligence test alone. Ideally, an IQ score should be interpreted in the context of a broader assessment which includes other tests as well as information from parents, teachers and other professionals as appropriate.