

Objective

1. Students will differentiate between reliability and validity.
2. Students will examine the influence of heredity and environment on intelligence.

Warm Up

What is the g factor? Explain this idea.

The g Factor

- ▶ Charles Spearman noticed that individual's scores on various tests of intellectual performance correlated with one another.
- ▶ That is, people who performance well on one test, such as math reasoning, tended to do well on verbal ability tests.
- ▶ Based on this observation, Spearman proposed that intelligence is a single underlying factor, which he termed general intelligence or the g factor.

Raymond Cattell

- ▶ Raymond Cattell's research studies led him to divide Spearman's concept of general intelligence into two subgroups:
 - fluid intelligence
 - crystallized intelligence

Fluid Intelligence

- ▶ Fluid intelligence includes memory, speed of information processing and reasoning abilities.
 - ▶ Cattell believed it is innate and not influenced by education and experience.
 - ▶ It is largely biological (neuron speed, memory capacity) and therefore can decline with age.
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Crystallized Intelligence

- ▶ Refers to the store of knowledge and skills gained through experience and education.
- ▶ It remains stable or increases slightly with age.

Standardized Tests

- ▶ Standardization means that the test has been uniformly presented to a large, representative sample of people.
 - ▶ The scores of these people set the norms or standards.
 - ▶ Your score is compared to a standard of performance by all test-takers.
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How do you know if the test is reliable?

- ▶ Reliability means that a test must produce consistent results when it is administered on repeated occasions.
 - Test-retest method: researchers compare participant's scores on two separate administrations of the same test. If there is a high correlation between the two test scores, the test is reliable.

How do you know if a test is reliable?

- ▶ split-half method: the test is divided into two equivalent parts, like even numbered and odd numbered questions. There should be a very high correlation between the odd and even numbered questions on the test if it is reliable.

How do you know if a test is valid?

- ▶ Validity is the ability of a test to measure what it was designed to measure.
- ▶ Criterion validity means a test demonstrates it can be used to predict future performance.
 - Example: the AP Psych exam is designed to measure your knowledge of a college-level introductory psychology course.
 - Example: Your AP Psych exam demonstrates criterion validity if your results are correlated with high scores in college psychology courses.

Caution!

- ▶ Tests can be reliable but not valid!
 - Example: A driver's license test may be reliable, but it is not valid because it is not correlated with how well a student performs on the actual road test.
 - You might pass the written test but fail the driving test!

Study Tip

- ▶ “R” in reliability with the “R’s” in repeatable results.
- ▶ “C” in criterion validity with the “C” in correlates/connects to future performance.

Heredity or Environment?

- ▶ Arguments for heredity:
 - 1. Identical twin studies support the hypothesis that intelligence is, in part, inherited.
 - IQ correlation is greater for identical twins than fraternal twins.
 - 2. Adoption studies show that IQs are more strongly correlated with biological mothers than with adoptive mothers.

Arguments for Environment

1. Identical twins reared separated support the hypothesis that environment plays an important role in determining IQ
 - The correlation between the IQ scores of identical twins reared separately is lower than those reared together.
2. Studies also find that early enrichment programs can have a positive impact on children's IQ scores.

Self-Fulfilling Prophecy

- ▶ IQ scores and other test scores can be very powerful labels that affect how others see a person or a how a person sees himself.
- ▶ A self-fulfilling prophecy occurs when a person's expectations of another person leads that person to behave in the expected way.

Mental Retardation

- ▶ Applied to individuals who score 70 or below on the IQ test and who are unable to function independently in society.
 - Only 1–3% of population

Gifted

- ▶ Usually IQs of 140 or above.
 - ▶ 1–3% of the population
 - ▶ Lewis Termans' study of 1,528 California elementary students, Known as "Termites."
 - ▶ Longitudinal study through school and adulthood
 - ▶ Achieved high levels of academic and career success, however, roughly same divorce rate as the general population.
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Preview

- ▶ Test and terms unit 11 on Monday

Exit Ticket

- ▶ Why are reliable standardized tests not always valid?