

Advanced Placement Psychology

Chapter 11: Intelligence

(<http://www.ApPsychology.net>)

- We use **intelligence tests** to give a numerical value to ones mental abilities by comparing them to others.

The Origins of Intelligence Testing

- *Francis Galton* (1822-1911) had great enthusiasm in measuring human traits that lead to the “eugenics” movement. His goal was to “quantify human superiority” by means of tests on strength, reaction time, sensory precision and even head size. Despite his efforts, no correlation whatsoever was found between general mental abilities and the traits.
- *Alfred Binet* – founder of modern intelligence testing, sought methods to identify students who would have difficulties in regular classes by measuring ones **Mental Age** – if you perform the way a typical 10 year old would, then your mental age is 10 years old, regardless of your real age. This lead to labelling problems. Ie, people saw your level of intelligence and not really who you are.
- *Lewis Truman*- developed the current **Stanford-Binet** intelligence test. The test measures IQ **Intelligence Quotient**- mental age divided by chronological age(real age) times 100. If you are 12 years old(chronological age) and your mental abilities are the same as those who are 12 years old (mental age). Then your IQ is $12/12 \times 100 = 100$, the average IQ.
- The stanford-Binet test became applied to many people of differing races. The result, Truman realized, the reason why non-Anglo Saxons did worst is because the test measures not only their innate abilities but also education and cultural distinctiveness.

What is Intelligence

- We define **Intelligence** as the ability/capacity to be goal oriented and exhibit adaptive behavior.
- IQ is not a fixed “thing” one has; it is merely a score one obtains from a test.
- Know that intelligence is always expressed in a context. Ie, in the context of warriors, musicians, engineers, artists, different intelligence levels will be expressed in different areas by one individual.
- To determine if many factors undermine ones general mental ability, psychologists make use of **factor analysis** – a statistical method that identifies a variety of related factors in a test.
- Charles Spearman believed that there is a **general intelligence factor** or **g factor** undermining each ability/factor. Ie, those who excelled in reasoning also did quite well in all other areas such as spatial ability, verbal, memory, and word fluency.
- People with **Savant syndrome** excel exceptionally in one ability/skill but has limited mental abilities. Ie, a 12 year old who has difficulty speaking and walking but can compute numbers as fast as a calculator. Thus, contrary to the g factor, Howard Gardner believes we have “multiple intelligences” that are independent of each other.
- Also supporting the multiple intelligence theory is the existance of **emotional intelligence** – the ability to manage, express, understand, and perceive emotions. People with high emotional intelligence do better in social situations and thus are more successful in careers, marriages, and parenting. This EI is independent, if not negatively correlated, with academic intelligence.
- With modern brain imaging techniques, researchers still fail (as did with Galton) to find significant correlation between head size and intelligence.
- Brains of people with high performances are less active (intake less glucose), quick, and registers information with more complexity. One explanation for this could be that people with faster cognitive processes acquire more information.

Assessing Intelligence

- **Aptitude tests** – [predict your future performance or ability to learn new skill](#). Ie, college entrance exam(designed to test your ability to do college work), intelligence tests, physical examinations

- **Achievement tests** – assesses your current knowledge or what you know. I.e., final course examinations (designed to test the knowledge you already obtained during the course), and chapter tests.
- Currently, the most widely used intelligence test is the **Wechsler Adult Intelligence Scale (WAIS)** it has 11 subtests and gives a verbal score, a performance score, and an overall score. Large differences between the verbal and nonverbal scores indicate possible learning difficulties.
- Psychological tests must meet all **3** of the following criteria in order to be widely accepted.
 1. **Standardization** – To standardize a test, it must first be given to a large representative sample of people in which their scores will be set as the standard for comparison.
 - Normal curve**- a bell shaped curve of scores formed by standardized test results. The majority (68%) of people fall within the center or average of the curve.
 2. **Reliability** – To be reliable, a test must yield consistent results. This is done by comparing scores on two halves of a test or by retesting.
 3. **Validity** – The degree to which a test measures what it is supposed to measure.
 - Content validity** – corresponds to **achievements** tests. The extent to which a test **measures** it's intended behavior.
 - Predictive validity** (or **criterion-related validity**) - corresponds to **aptitude** tests. The success the test has in **predicting** intended behavior
 - Criterion** – The behavior being tested.
- *Flynn Effect – Intelligence tests worldwide show an increase in scores since 1960's. BUT aptitude test scores are decreasing; Possible explanations: Greater academic diversity, better education, and/or improved nutrition.*

The Dynamics of Intelligence

- Before age 3, except for extremely impaired children, casual observations and intelligence tests predict future aptitudes minimally; but by age 3, performances on intelligence tests begin to predict adolescent and adult scores
- By age 7, intelligence tests become more stable and increases in stability with age of child
- **Mental retardation**: condition of limited mental ability as indicated by an intelligence score of below 70 and produces difficulty in adapting to demands of life; *varies from mild to profound*; *ONLY* one percent of population meets criteria and males outnumber females by 50 percent
- One cause of mental retardation is **Down syndrome**: physical disorders caused by an extra chromosome in one's genetic makeup
- **Creativity**: ability to produce novel and valuable ideas
- Discovered that certain level of aptitude is necessary but not sufficient for creativity, correlates, but only to certain level (score of about 120)
- Those who are freed from concern of social approval demonstrate better creativity

Genetic and Environmental Influences on Intelligence

- IQ scores of identical twins are virtually the same as though one person taking test twice whereas IQ scores of fraternal twins are less similar
- Evidence of environmental influence –fraternal twins who are no more genetically alike than any other sibling, but are treated more alike tend to score high than other siblings
- Adopted children score more similar to their biological parents than their adopted parents
- **Heritability**: proportion of variation among individuals that we can attribute to genes; heritability of trait may vary, depending on range of populations and environments studied
- Environment that siblings share influences their aptitudes marginally, but significantly influences scholastic achievements
- Psychologist J. McVicker Hunt tested the benefits of responsive caregiving; trained caregivers to play vocal games with infants in which first they imitated babies' babbling, then led babies in vocal follow-the-leader (shifting from one familiar sound to another) and finally begin to teach them sounds from Persian language; results were all 11 infants could name more than 50 objects and body parts by 22 months; *Hunt's experiment shows importance of environment on children's intelligence*
- Racial groups differ in average scores on intelligence tests
- Difference not mostly based on genetics unlike individual performance differences because heritability within groups would not eliminate the possibility of strong environmental impact on the group differences

- Example -IQ performances of today's better-fed and better-educated population exceeds those from 1930s population by the same amount as average white today exceed average african-american
- Girls are better spellers and are equal or surpasses average boy in math grades, but boys tend to score better in math problem solving
- David Geary and Irwin Silverman speculate that skills came from evolutionary perspective where males tend to be stronger in skills that their ancestral fathers needed such as tracking prey and navigating way home whereas females were enhanced in keen memory for location of edible planes by their ancestral mothers
- Researchers discovered that some people are better emotional detectors than others while women are better at it than men
- Some speculate that through evolution where ancestral mother learned to read emotions of infant and may have further being fueled by cultural tendencies to encourage empathic skills

Bibliography

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