

Chapter 10: Intelligence

- Overall Question: Does each of us have an inborn level of talent, a general mental capacity or set of abilities, and can that level be measured and represented by a score on a test?
- Definitions of Intelligence
 - Intelligence can be defined as “whatever intelligence tests measure”
 - Generate scores; allows us to compare individuals
 - Intelligence: the ability to learn from experience, solve problems, and use knowledge to adapt to new situations (better definition)
- Ideas of Intelligence
 - Charles Spearman → General intelligence (also known as g)
 - Performed a factor analysis of different skills and found that people who did well in one area also did well in another; these people have a high “g”
 - Louis Thurstone → 7 Clusters of Mental Abilities
 - Verbal comprehension, inductive reasoning, word fluency, spatial ability, memory, perceptual speed, numerical ability
 - Howard Gardner’s Multiple Intelligences (8)
 - Naturalist, linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, intrapersonal, interpersonal
 - Different people have intelligence/ability in different areas
 - There may be a correlation among these intelligences
 - Used “savant syndrome” to support his theories (one isolated genius ability)
 - Robert Sternberg
 - Intelligence Triarchy
 - Practical intelligence (“street smarts”), analytical intelligence (“school smarts”), creative intelligence (“thinking outside the box”)
 - Five components of creativity
 - Expertise (well-formed knowledge base)
 - Imaginative thinking (seeing things in brand new ways)
 - Venturesome personality
 - Intrinsic motivation
 - Creative environment
- Intelligence and Success
 - “Success in life” is impossible to define. However, wealth tends to be related to intelligence test scores, PLUS:
 - focused daily effort/practice
 - social support and connections
 - hard work and energetic persistence
- Creativity refers to the ability to produce ideas that are novel and valuable
 - Creative intelligence: using creativity to adapt to novel (brand new) situations
 - Convergent thinking-coming up with the ONE right answer to a problem
 - Divergent thinking-coming up with multiple solutions to a problem
- Social and Emotional Intelligence (not assessed in schooling)
 - Social intelligence: being able to understand/navigate social situations

- o Emotional intelligence: being able to process/manage the emotional part of those social situations
 - Benefits of emotional intelligence
 - The ability to delay gratification while pursuing long-term goals (not be driven by immediate impulses)
 - Contributes to success in career, marriage, and parenting situations
 - Components of emotional intelligence
 - Perceiving emotions
 - Understanding emotions
 - Managing emotions
 - Using emotions
- Origins of IQ Tests: Predicting School Achievement
 - o Problem: (late 1800s) Paris schools needed to objectively identify children in need of special classes
 - o Solution: Alfred Binet devised tests (Who needs special education?)
 - Goal was to measure each child's mental age
 - A 10 year old with below average intelligence might have a mental age of 8
 - o Lewis Terman (Stanford Univ. professor) modified Binet's test for American children
 - The Stanford-Binet intelligence test
 - o William Stern's scoring (1914) of the Stanford-Binet test resulted in the concept of IQ (intelligence quotient)
 - Preserved Binet's comparison of mental to chronological age as ratio/quotient (x100)
 - A 10 year old with a mental age of 8 would have an IQ score of 80
 - o What do scores mean?
 - Terman began with a different assumption than Binet. He thought that intelligence was inherited.
 - Later, Terman saw how scores can be affected by people's level of education and their familiarity with the language and culture used in the test
 - What to do if you score low on an IQ test?
 - Binet → study, and develop self-discipline and attention span
 - Terman → remove genes from the population (eugenics)
- Aptitude vs. Achievement
 - o Achievement tests measure what you already have learned (psych exam)
 - o Aptitude tests attempt to predict your ability to learn new skills (IQ tests)
 - David Wechsler's Tests: Intelligence PLUS
 - Wechsler Adult Intelligence Scale (WAIS) and Wechsler Intelligence Scale for Children (WISC)
 - Measure "g"/IQ and have subscores for:
 - o Verbal comprehension
 - o Processing speed
 - o Perceptual organization
 - o Working memory
- Principles of Test Construction
 - o Standardization: Defining the meaning of scores based on a comparison with a pretested group

- To evaluate your performance, we need to compare it to other individual's scores
 - Where does your raw score fall on a distribution of scores by people of your chronological age?
 - Group members' scores are distributed in a bell-shaped curve → "normal curve"
- o Reliability and Validity
 - A test or other measuring tool is reliable when it generates consistent results
 - Split-half reliability
 - Test-retest reliability
 - A test or measure has validity if it accurately measures what it is supposed to measure
 - Content validity
 - Predictive validity
 - o Only in broad ranges: Why does the predictive power of aptitude scores diminish as students move up the educational ladder?
- Genetic and Environmental Influences on Intelligence (Nature & Nurture)
 - o Are people "successful" because of inborn talents? Or are they "successful" because of their unequal access to better nurture?
 - Both nature and nurture affect intelligence test scores
 - With age, the intelligence test scores of adoptees looks more and more like that of their biological parents
 - o Environmental influences on intelligence
 - Environment has more influence on intelligence under extreme conditions such as abuse, neglect, or extreme poverty
 - Malnutrition, sensory deprivation, and social isolation can depress cognitive development
 - o Schooling and Intelligence
 - Schooling and intelligence interact, and both boost children's chances for success
 - What predicts college students' academic achievement?
 - Study motivation
 - Study skills, especially the willingness to practice
 - Fixed mindset: intelligence is biologically set and unchanging
 - Growth mindset: intelligence is changeable (focus on the human potential)
- Group Differences in Test Scores
 - o Gender differences
 - Boys are more likely than girls to be at the high or low end of the intelligence test score spectrum
 - Girls are better at locating objects, detecting emotions, and tend to be more verbally fluent
 - Boys tend to perform better on spatial ability tests
 - In overall math performance, boys and girls are very similar
 - o Racial differences
 - Group differences, including intelligence tests score differences between so-called "racial groups," can be caused by environmental factors
 - o Impact of environment