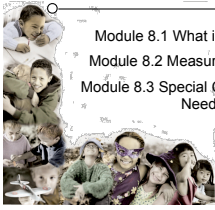


Chapter 8: Intelligence and Individual Differences in Cognition

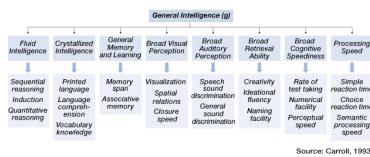


- Module 8.1 What is Intelligence?
- Module 8.2 Measuring Intelligence
- Module 8.3 Special Children, Special Needs

Psychometric Theories

- Use **patterns** of test performance as starting point
- Test scores** provide evidence for general intelligence (g) and specific intelligences (e.g., perceptual speed, word comprehension)
- Hierarchical** theories are a compromise between general and specific theories

Hierarchical View of Intelligence



9.1: Psychometric Theories

47 Gardner's Theory of Multiple Intelligences

Type of Intelligence	Definition
Linguistic	Examining the meanings of words, having the ability to use words to understand new ideas, and using language to convey ideas to others.
Logical-mathematical	Understanding relations that exist among objects, values, and ideas as well as the logical or mathematical operations that can be performed on them.
Spatial	Perceiving objects accurately and imagining in the "mind's eye" the appearance of an object before and after it has been transformed.
Musical	Comprehending and producing sounds varying in pitch, rhythm, and emotional tone.
Bodily-kinesthetic	Using one's body in highly differentiated ways, as dancers, acrobats, and athletes do.
Intrapersonal	Identifying different feelings, words, motivations, and interests in others.
Interpersonal	Understanding one's emotions and knowing one's strengths and weaknesses.
Naturalistic	Recognizing and distinguishing among members of a group (species) and detecting similarities between such groups.
Existential	Considering "ultimate" issues, such as the purposes of life and the nature of death.

Source: Gardner, 1983, 1986, 1993.

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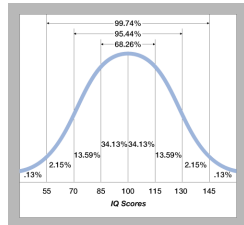
Sternberg's Theory

- Analytical ability**--involves analyzing problems and figuring out a solution. Logical.
- Creative ability**-- involves adapting to *novel* tasks by discovering novel solutions. Artistic.
- Practical ability**--involves knowing how solutions and plans actually work. Street Smarts.

Measuring Intelligence: Summary

- Binet used **mental age** to distinguish "bright" from "dull" children
- Led to the Stanford-Binet which gives a single **IQ** score; average = 100
- WISC**, devised in the 1930s, gives verbal and performance IQ scores and a combination of the two scores
- Bayley Scales** are used to test infants.

Distribution of IQ Scores



Sample Items from WISC-II

Items Like Those Appearing on Different Subtests of the WISC-II

Verbal Scale

Information: The child is asked questions that tap his or her factual knowledge of the world.

1. How many wings does a bird have?
2. What is steam made of?

Comprehension: The child is asked questions that measure his or her judgment and common sense.

1. What should you do if you see someone forget his book when he leaves a restaurant?
2. What is the advantage of keeping money in a bank?

Similarity: The child is asked to describe how words are related.

1. In what way are a lion and a tiger alike?
2. In what way are a lion and a hamster alike?

Picture Arrangement: Pictures are shown and the child is asked to place them in order to tell a story.

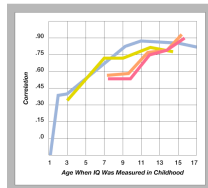
Picture Completion: The child is asked to identify the part that is missing from the picture.

9.2: Stern and the Development of Intelligence Testing

Summary: Do Tests Work?

- Are they **reliable**? In the short term, yes. In the longer term, less so.
- BUT Infant tests do not reliably predict adult IQ, although scores obtained in childhood do.
- Are they **valid**? Yes, tests are good predictors of success in school and the workplace, particularly for more complex jobs.
- Validity can be increased with **dynamic testing** (measures learning potential)

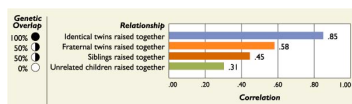
Correlation Between Childhood and Adult IQ

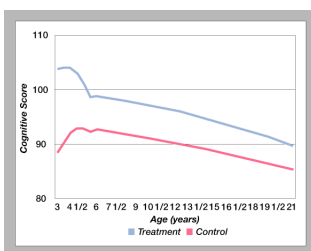


Hereditary and Environment

- Effects of heredity shown in family studies
- Heredity also influences patterns of intellectual development (twins, adoptees)
- Effects of environment shown in studies of home environments (children with high test scores come from well-organized homes), historical change in IQ scores, and intervention programs

Correlations of IQ for Family Members





Impact of Ethnicity and Socioeconomic Status

- Asian Americans have highest scores followed by European Americans, Hispanic Americans, and African Americans
- Group differences reduced when compare groups of similar economic status
- **Culture-fair intelligence tests** reduce the differences but don't eliminate them
- **Stereotype threat**: knowledge of stereotypes leads to anxiety and reduced performance
- Test-taking Skill must be considered, too

Gifted and Creative Children

- **Gifted**: traditionally refers to someone with scores on intelligence tests of at least 130.
- Exceptional talent must be nurtured.
- Intelligence is associated with **convergent thinking** (arriving at one, correct answer).
- Creativity is associated with **divergent thinking** (aim is novel lines of thought).
- -but must be good.
- Differences between Mozart and Salieri.

Children with Mental Retardation

- **Mental retardation**: substantially below average intelligence
- **Organic** mental retardation: retardation caused by a specific biological or physical problem, only about 25% of the cases, usually more severe
- **Familial** mental retardation: represents the lower end of the normal distribution of intelligence

Levels of Mental Retardation

		10%		90%			
AAMR		Profound	Severe	Moderate	Mild		
IQ Level	10	20	30	40	50	60	70
Educators		Custodial		Trainable		Educable	

9.3: Children with Mental Retardation

Children with Learning Disabilities

- Children with **learning disabilities** have normal intelligence, but have difficulty mastering academic material, and have no other explanation.
- Many different learning disabilities so difficult to diagnose and many different treatments.