

# Intelligence



Is it the ability to use reason and logic?  
Is it the ability to write and speak clearly?  
Is it limited to one's performance in school?  
Is it behavior in social situations?  
How about knowing when you're wrong?

Not that simple, right?

There are many psychological theories of intelligence that will explain the concept

# What is Intelligence?

The ability to act purposefully, think rationally, and deal effectively with the environment  
(David Wechsler)

- The mental abilities that enable one to adapt to, shape, or select one's environment.
- The ability to judge, comprehend, and reason.
- The ability to understand and deal with people, objects, and symbols.



# Theories of Intelligence

# Broader Theory of Intelligence

- Howard Gardener proposed a theory of *multiple intelligences*, in which he identified 9 distinct types of intelligence.
  
- The first three intelligences are included in psychometric theories of intelligence:
  - Linguistic intelligence
  - Logical-Mathematical Intelligence
  - Spatial Intelligence

# What Do These Intelligences Examine?

- ❑ **Linguistics** – the ability to speak and write well.
- ❑ **Logical-Mathematical** – the ability to use logic and mathematical skills to solve the problems
- ❑ **Spatial** - capacity to perceive the visual world accurately, to perform transformations upon perceptions and to re-create aspects of visual experience in the absence of physical stimuli

# Gardener's Theory of Multiple Intelligence

- Gardener's remaining 6 distinct intelligences are unique to Gardner's theory:
  - Musical
  - Bodily-kinesthetic
  - Interpersonal
  - Intrapersonal
  - Naturalistic
  - Existential intelligence

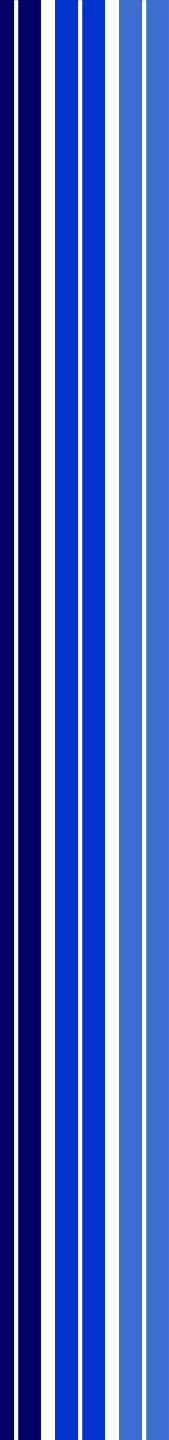
# What are these Intelligences?

- ❑ **Musical** - The ability to perform and enjoy music
- ❑ **Bodily-Kinesthetic** - Use of one's body in highly skilled ways for expressive or goal-directed purposes, capacity to handle objects skillfully. i.e. ability to move the body in sports.
- ❑ **Interpersonal** - The ability to understand and interact effectively with others
- ❑ **Intrapersonal** – the ability to have insight in self
- ❑ **Naturalistic** -- sensitivity and understanding of plants, animals, and other aspects of nature
- ❑ **Existential** - sensitivity to issues related to the meaning of life, death, and other aspects of the human condition



The question arises... should we use the word intelligence to describe all valuable skills like doing calculus, speaking 6 different languages, being able to make the throw from home to second?

If we do... then Gardner is correct... people do have many unrelated kinds of intelligence. Now we have changed the definition and meaning of intelligence



Gardener's theory has prompted researchers to begin examining other nontraditional aspects of intelligence

The best known is emotional intelligence

# Emotional Intelligence

- ❑ Most intelligences can be grouped into 1 or 3 clusters ... abstract, concrete, or social intelligence.
- ❑ Social intelligence (Thorndike): ability to understand and relate to people.
- ❑ Emotional intelligence has its roots in social intelligence.

## Emotional Intelligence includes:

- ❑ Being aware of one's own emotions.
- ❑ Being able to manage one's own emotions.
- ❑ Being sensitive to the emotions of others.
- ❑ Being able to respond to & negotiate with other people emotionally.
- ❑ Being able to use one's own emotions to motivate oneself.

# Cattell's View of Intelligence, Intelligence as a Few Basic Abilities

## □ Fluid Intelligence

- The ability to think on the spot and solve novel problems
  - The ability to perceive relationships
  - The ability to gain new types of knowledge

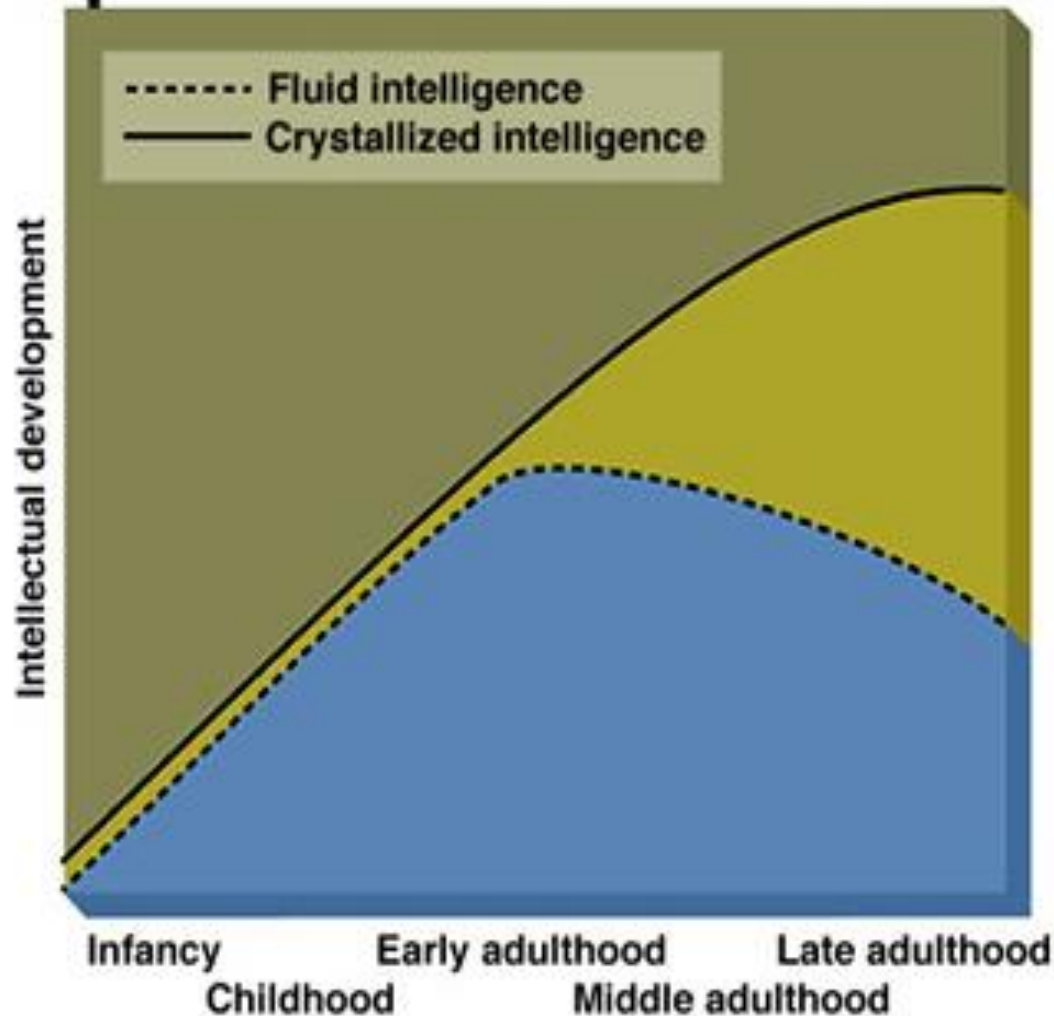
## □ Crystallized Intelligence

- Factual knowledge about the world
  - The skills already learned and practiced
  - Examples
    - Arithmetic facts
    - Knowledge of the meaning of words
    - State capitals

# Intelligence Tests and Basic Abilities

- Fluid intelligence on tests is measured by:
  - The ability to assemble novel puzzles
  - The ability to determine the next entry in a series of numbers
  - The ability to identify which one of four objects is related to the others
- Children who do well on one test of fluid intelligence usually do well on other tests of fluid intelligence
  - They may not necessarily perform well on tests of crystallized intelligence

# Fluid and Crystallized Intellectual Development Across the Life Span



# Thorndike Multifactor theory of intelligence

- Intelligence is nothing more than a convenient name given to infinite number of specific abilities combined together.
  
- Three kinds of intelligence
  - Social intelligence
  - Concrete intelligence
  - Abstract intelligence



# Three kinds of Intelligence

- **Social intelligence**. Social Intelligence is an ability to understand and deal with persons.
- **Concrete intelligence**. It is the ability to understand and deal with things as in skilled trades or scientific appliances this is also known as mechanical or motor intelligence.
- **Abstract intelligence**. Abstract Intelligence or ability to understand and deal with verbal and mathematical symbols

# Assessment of Intelligence

The goal of most intelligence tests is to measure the general intelligence.

Good intelligence tests are

*reliable* (they are consistent over time),

*validity* (they actually measure intelligence rather than something else) and

*standardized* (test involves giving it to a large number of people at different ages and computing the average score on the test at each age level).

# Contribution of Psychology

- ❑ Intelligence is such an important individual difference dimension, psychologists have invested substantial effort in creating and improving measures of intelligence, and these tests are now the most accurate of all psychological tests.
- ❑ In fact, the ability to accurately assess intelligence is one of the most important contributions of psychology to everyday public life.

# Purpose of Intelligence Testing

- Social judgment
- Level of thinking
- Language skills
- Perceptual organization
- Processing speed
- Spatial abilities
- Common sense
- Long and short term memory
- Abstract thinking
- Motor speed
- Word knowledge

# How is Intelligence Measured?



The first Intelligence test was created by Binet and Simon using in 1905, simple tasks to distinguish children who would do well in school from those who wouldn't

Binet and Simon used Mental age to distinguish “bright” from “dull” children

# What is IQ?

- Lewis Terman revised Simon and Binet's test and published a version known as the *Stanford-Binet Test* in 1916.
- Performance was described as an intelligence quotient (IQ) which was imply the ratio of mental age to chronological age multiplied by 100:

$$IQ = MA/CA \times 100$$

# Stanford-Binet IQ Test

- This test measures things that are necessary for school success
  - Understanding and using language, memory, the ability to follow instructions, and computational skills
  
- Binet's test is a set of age-graded items
  - Binet assumed that children's abilities increase with age
  - These items measure the person's "mental level" or "mental age"
  
- Adaptive Testing
  - Determine the age level of the most advanced items that a child could consistently answer correctly
  - Children whose mental age equal their actual or chronological age were considered to be of "regular" intelligence



# Sample Stanford-Binet Test Items

4	Name objects from memory; complete analogies (fire is hot; ice is _____); identify objects of similar shape; Answer simple questions (Why do we have schools?)
6	Define simple words; Explain differences (between a fish and a horse); identify missing parts of a picture; count out objects
8	Answer questions about a simple story; explain similarities and differences among objects; tell how to handle certain situations (finding a stray puppy)
10	Define more difficult words; Give explanations (about why people should be quiet in a library); List as many words as possible; repeat 6-digit numbers
12	Identify more difficult verbal and picture absurdities; repeat 5-digit numbers in reverse order; define abstract words (sorrow); fill in a missing word in a sentence
Adult	Supply several missing words for incomplete sentences; Repeat 6-digit numbers in reverse order; Create a sentence using several unrelated words; Describe similarities between concepts

# Intelligence Quotient (IQ)

- ❑ This summary is used to indicate a child's intelligence relative to others of the same age
- ❑ IQ tests measure an individual's probable performance in school and similar settings
- ❑ An IQ test measures performance... but an IQ test does not explain performance

# Wechsler Intelligence Scale

- ❑ One of the most widely used individual evaluation measures of intelligence utilized in today's schools.
- ❑ **Consists of two parts:**
  - Verbal test
  - Performance test
- ❑ Wechsler Intelligence Scale for Children-Third Edition (WISC-III)
  - Used with children 6 to 16
- ❑ Wechsler Adult Intelligence Scale-Third Edition (WAIS-III)
  - Used with people 17 and older

# Culture-Fair Intelligence Tests

## □ Raven's Progressive Matrices

A “culture-fair” or culture-reduced test that would make minimal use of language and not ask for any specific facts

These matrices progress from easy to difficult items -- measures abstract reasoning

## □ Even on culture-fair tests, Euro-American and African-American children still differ

One reason - culture can influence a child's familiarity with the entire testing situation