

# OA

1. What is an intelligence? (can you describe it?)
2. Are you intelligent? (explain)

Intelligence

# What is Intelligence?

**Intelligence** (in all cultures) is the ability to learn from experience, solve problems, and use our knowledge to adapt to new situations.

In research studies, *intelligence* is whatever the intelligence test measures. This tends to be “school smarts.”

Psychologists believe that intelligence is a concept and not a thing.

# Conceptual Difficulties

When we think of intelligence as a trait (thing) we make an error called *reification* — viewing an abstract immaterial concept as if it were a concrete thing.

Examples: Race and Nationality

1. Is intelligence a single overall ability or is it several specific abilities?
2. With modern neuroscience techniques, can we locate and measure intelligence within the brain?

# General Intelligence

The idea that **general intelligence (g)** exists comes from the work of **Charles Spearman** (1863-1945) who helped develop the **factor analysis** approach in statistics.



Athleticism, like intelligence, is many things

# General Intelligence

Charles Spearman proposed that *general intelligence (g)* is linked to many clusters that can be analyzed by factor analysis.

Factor analysis – statistical procedure that identifies clusters of related items. For example, people who do well on vocabulary examinations do well on paragraph comprehension examinations, a cluster that helps define verbal intelligence. Other factors include a spatial ability factor, or a reasoning ability factor.

# Quick Discussion

- Do you agree with the idea that there is one general intelligence?
- Why or why not?
- Is athleticism a general thing?

# Criticism for General Intelligence

**L. L. Thurstone**, a critic of Spearman, analyzed his subjects NOT on a single scale of general intelligence, but on seven clusters of *primary mental abilities*, including:

1. Word Fluency
2. Verbal Comprehension
3. Spatial Ability
4. Perceptual Speed
5. Numerical Ability
6. Inductive Reasoning
7. Memory



# Criticism for Thurstone

Later psychologists analyzed Thurstone's data and found a weak relationship between these clusters, suggesting some evidence of a  $g$  factor.

Those who excelled in one of Thurstone's abilities were also strong with another. For example, those who excelled in word fluency were also strong with verbal comprehension

# Early Theories of Intelligence

- **Charles Spearman**

- Believed intelligence is general
- People who are bright in one area are usually bright in other areas as well

- **L. L. Thurstone**

- Believed that intelligence is made up of seven distinct, independent abilities
  - Spatial ability, perceptual speed, numerical ability, verbal meaning, memory, word fluency, and reasoning

# Early Theories of Intelligence

- **Raymond Cattell and John Horn**
  - Believed that g factor should be divided into two clusters of mental abilities
    - *Crystallized intelligence* includes learned knowledge and skills such as vocabulary that increases with age.
      - Retaining information
    - *Fluid intelligence* pattern recognition, abstract reasoning, and problem-solving. Decreases with late adulthood.
      - Problem solving and abstract thinking

While education can increase crystallized intelligence, it was not thought to have any effect on fluid intelligence

# Example of Fluid Knowledge

- What do these things have in common?
  - Seven deadly sins
  - Alms giving
  - Fasting
  - Prayers
  - Praying and singing together
  - Meditation
  - *Ahimsa* (Non-harming)
  - *Dharma* (Duty )
  - Asceticism
  - *Anatman* (no-self)



# Contemporary Intelligence Theories

**Howard Gardner** (1983, 1999) supports Thurstone's idea that intelligence comes in multiple forms. Gardner notes that brain damage may diminish one type of ability but not others.



People with **savant syndrome** excel in abilities unrelated to general intelligence.

# Howard Gardner

Gardner proposes **eight types** of intelligences and speculates about a ninth one — *existential intelligence*. Existential intelligence is the ability to think about the question of life, death and existence.

## GARDNER'S EIGHT INTELLIGENCES

Aptitude	Exemplar
1. Linguistic	T. S. Eliot, poet
2. Logical-mathematical	Albert Einstein, scientist
3. Musical	Igor Stravinsky, composer
4. Spatial	Pablo Picasso, artist
5. Bodily-kinesthetic	Martha Graham, dancer
6. Intrapersonal (self)	Sigmund Freud, psychiatrist
7. Interpersonal (other people)	Mahatma Gandhi, leader
8. Naturalist	Charles Darwin, naturalist

# OA

- <https://www.youtube.com/watch?v=r6HCXx8U6Ko>
  - <https://www.youtube.com/watch?v=bsJbApZ5GF0>
1. What similarities do these individuals with Savant syndrome have?
  2. What is generalized intelligence? Would it support the idea of savants?

# Contemporary Theories of Intelligence

- Robert Sternberg
  - **Triarchic theory** of intelligence posits three types of intelligence not Gardner's 8+
  - *Analytical intelligence* includes the ability to learn how to do things, solve problems, and acquire new knowledge. Intelligence that is assessed by intelligence tests. (e.g. book smarts)
  - *Creative intelligence* includes the ability adjust to new tasks, use new concepts, and respond well in new situations
  - *Practical intelligence* includes the ability to select contexts in which you can excel and solve practical problems. Intelligence that is required for everyday tasks (e.g. street smarts).
    - Motivating people; promoting ones own career



## COMPARING THEORIES OF INTELLIGENCE

Theory	Summary	Strengths	Other Considerations
Spearman's general intelligence ( <i>g</i> )	A basic intelligence predicts our abilities in varied academic areas.	Different abilities, such as verbal and spatial, do have some tendency to correlate.	Human abilities are too diverse to be encapsulated by a single general intelligence factor.
Thurstone's primary mental abilities	Our intelligence may be broken down into seven factors: word fluency, verbal comprehension, spatial ability, perceptual speed, numerical ability, inductive reasoning, and memory.	A single <i>g</i> score is not as informative as scores for seven primary mental abilities.	Even Thurstone's seven mental abilities show a tendency to cluster, suggesting an underlying <i>g</i> factor.
Gardner's multiple intelligences	Our abilities are best classified into eight independent intelligences, which include a broad range of skills beyond traditional school smarts.	Intelligence is more than just verbal and mathematical skills. Other abilities are equally important to our human adaptability.	Should all of our abilities be considered <i>intelligences</i> ? Shouldn't some of them be called less vital <i>talents</i> instead?
Sternberg's triarchic	Our intelligence is best classified into three areas that predict our real-world success: analytical, creative, and practical.	These three facets may be reliably measured.	<ol style="list-style-type: none"><li>1. These three facets may be less independent than Sternberg thought and may actually share an underlying <i>g</i> factor.</li><li>2. Additional testing is needed to determine whether these facets can reliably predict success.</li></ol>

# OA

1. According to Sternberg's Theory, what kind of intelligence do you think you possess?
2. According to Gardner's Theory, what kind of intelligence(s) do you think you possess?
3. Which theory of intelligence do you think describes intelligence the best? (Explain)

# Comparing the Multiple Intelligence Theories

Gardner's Multiple Intelligences	Sternberg's Triarchic Intelligences	Goleman's Emotional Intelligence
Logical-Mathematical Linguistic	Analytical	
Spatial Musical Body-Kinesthetic	Creative	
Interpersonal	Practical	Recognizing emotions in others and managing relationships
Intrapersonal		Knowing, managing, and motivating yourself with emotions

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