

# PSYCHOLOGY

(8th Edition)

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PowerPoint Slides  
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## Introduction to Intelligence

Module 31

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## Intelligence

### What is Intelligence?

- Is Intelligence One General Ability or Several Specific Abilities?
- Emotional Intelligence
- Intelligence and Creativity
- Is Intelligence Neurologically Measurable?

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## Intelligence

Do we have an inborn general mental capacity (intelligence) and can we quantify this capacity as a meaningful number?

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## What is Intelligence?

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

In research studies, *intelligence* is whatever the intelligence tests measure ... which tends to be school smarts.

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**OBJECTIVE 31-1| Discuss the difficulty of defining *intelligence*, and explain what it means to “reify intelligence.”**

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## Conceptual Difficulties

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

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

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## Controversies about Intelligence

Despite general agreement among psychologists about the nature of intelligence, there are two controversies that remain:

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

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## Intelligence: Ability or Abilities?

Have you ever thought that since people's mental abilities are too diverse — labeling them with one word *intelligence* may not be justified?

So you may speculate that diverse abilities may represent different kinds of intelligences. How can you test this idea?

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## 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

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**OBJECTIVE 31-2| Present arguments for and against considering intelligence as on general mental ability.**

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## General Intelligence

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

For example, people who do well on vocabulary do well on paragraph comprehension, a cluster that helps define verbal intelligence. Other factors include spatial ability factor a reasoning ability factor.

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## 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

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## General Intelligence

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

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## 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 not related to general intelligence.

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**OBJECTIVE 31-3| Compare Gardner's and Sternberg's theories of intelligence.**

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## Howard Gardner

Gardner proposes eight types of intelligences and speculates about a ninth one — *existential intelligence* — the ability to ponder about 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

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## Robert Sternberg

Sternberg (1985, 1999, 2003) also agrees with Gardner, but suggests three intelligences rather than eight.

1. **Analytical Intelligence:** Assessed by intelligence tests.
2. **Creative Intelligence:** Intelligence that makes us adapt to novel situations, generating novel ideas.
3. **Practical Intelligence:** Intelligence required for everyday tasks (e.g. street smart).

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## Theories: Comparison

COMPARING THEORIES OF INTELLIGENCE			
Theory	Summary	Strengths	Other Considerations
Spearman's general intelligence (g)	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 g 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 g 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 intelligences? Shouldn't some of them be called less vital talents 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 g factor.</li> <li>2. Additional testing is needed to determine whether these facets can reliably predict success.</li> </ol>

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## Emotional Intelligence

Emotional intelligence is the ability to perceive, understand and use emotions (Salovey and colleagues, 2005). The test of emotional intelligence measures overall emotional intelligence and its four components.

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**OBJECTIVE 31-4** Describe the four aspects of emotional intelligence, and discuss criticisms of this concept.

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## Emotional Intelligence: Components

Component	Description
Perceive emotion	Recognize emotions in faces, music and stories
Understand emotion	Predict emotions, how they change and blend
Manage emotion	Express emotions in different situations
Use emotion	Utilize emotions to adapt or be creative

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## Emotional Intelligence: Criticism

Gardner and others criticize the idea of emotional intelligence and question whether we stretch this idea of intelligence too far when we apply it to emotions.

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## Intelligence and Creativity

Creativity is the ability to produce ideas that are both novel and valuable. It correlates somewhat with intelligence.

1. **Expertise:** A well developed knowledge base.
2. **Imaginative Thinking:** The ability to see things in novel ways.
3. **Adventuresome Personality:** Seeks new experiences rather than following the pack.
4. **Intrinsic Motivation:** Motivated to be creative from within.
5. **A Creative Environment:** Creativity blooms in creative and supportive environment.

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**OBJECTIVE 31-5| Identify the factors associated with creativity, and describe the relationship between creativity and intelligence.**

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## Is Intelligence Neurologically Measurable?

Recent Studies indicate some correlation (about +.40) between brain size and intelligence. As brain size decreases with age, scores on verbal intelligence also decrease.



Gray matter concentration in people with high intelligence.

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**OBJECTIVE 31-6| Describe the relationship between intelligence and brain anatomy.**

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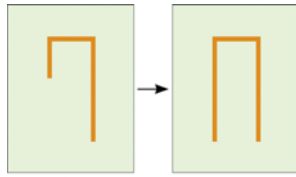
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## Brain Function

Studies of brain functioning show that people who score high on intelligence tests perceive stimuli faster, retrieve information from memory quickly, and show faster brain response times.



Question: Long side on left or right?

People with higher intelligence respond correctly faster to the above question.

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**OBJECTIVE 31-7| Discuss the findings on the correlations between perceptual speed, neural processing speed, and intelligence.**

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