
MODULE 33

Introduction to Intelligence

Module Preview

Today, intelligence is generally considered to be the ability to learn from experience, solve problems, and adapt to new situations. Psychologists debate whether intelligence is one general ability or several specific abilities. While a certain level of intelligence is necessary for creativity, beyond that level, the correlation is weak. Some theorists have expanded the definition of intelligence to include social intelligence, especially emotional intelligence. Psychologists have linked people's intelligence to brain anatomy and functioning as well as to cognitive processing speed.

Module Guide

Introduction

- ▶ Introductory Exercise: Fact or Falsehood?
- ▶ Exercises/Projects: What Is Intelligence?; Designing and Administering an Intelligence Test
- ▶ Lectures: Twelve Interesting Facts About Intelligence; Intelligence as the Capacity to Adapt
- ▶ Video: *Discovering Psychology, Updated Edition: Testing and Intelligence*

33-1. *Discuss the difficulty of defining intelligence, and explain what it means to reify intelligence.*

As a socially constructed concept, **intelligence** varies from culture to culture. Thus, most psychologists now define intelligence as the ability to learn from experience, solve problems, and use knowledge to adapt to new situations. To *reify* something is to view an abstract, immaterial concept as if it were a concrete thing. Thus, to *reify IQ* is to treat the intelligence quotient as if it were a fixed and objectively real trait, such as height, rather than as a score received on an **intelligence test**.

Is Intelligence One General Ability or Several Specific Abilities?

- ▶ Exercise: The Factor Analysis Approach
- ▶ Videos: Programs 3 and 15 of *Moving Images: Exploring Psychology Through Film: Brain and Behavior: A Contemporary Phineas Gage and Intelligence: One Ability or Many?*

33-2. *Present arguments for and against considering intelligence as one general mental ability.*

Psychologists agree that people have specific abilities, such as verbal and mathematical aptitudes. However, they debate whether a **general intelligence (g)** factor runs through them all, as proposed by Charles Spearman. **Factor analysis** has identified several clusters of mental abilities, including

verbal intelligence, spatial ability, and reasoning ability. Still, there seems to be a tendency for those who excel in one of the clusters to score well on others, as suggested by the results of L. L. Thurstone's ranking of people's primary mental abilities. Some psychologists today agree with Spearman's notion that we have a common level of intelligence that can predict our abilities in all other academic areas.

- ▶ Lectures: Savant Syndrome; Kim Peek's Brain; Gardner's Theory of Multiple Intelligences; Successful Intelligence; The Psychology of Wisdom
- ▶ Exercises: Questionnaire for Business Management; The Autism-Spectrum Quotient; Sternberg's Balance Theory of Wisdom; Ego-Resiliency
- ▶ Feature Film: *Rain Man* and Savant Syndrome
- ▶ PsychSim 5: Get Smart
- ▶ Instructor Video Tool Kit: *Savant Music Skills*; *Savant Art Skills: In Autism and Dementia*

33-3. *Compare Gardner's and Sternberg's theories of intelligence.*

Evidence that brain damage may diminish one ability but not others, as well as studies of **savant syndrome**, led Howard Gardner to propose his theory of multiple intelligences. These include linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, intrapersonal, interpersonal, and naturalist intelligences. Robert Sternberg also proposes a **triarchic theory** of multiple intelligences in which he distinguishes among analytical (academic problem solving), practical, and creative intelligences.

Intelligence and Creativity

- ▶ Lecture: Creative People—Ten Antithetical Traits
- ▶ Exercise: Assessing Creativity

33-4. *Identify the factors associated with creativity, and describe the relationship between creativity and intelligence.*

In general, people with high intelligence test scores do well on **creativity** tests. But beyond a score of about 120, the correlation between intelligence scores and creativity (the ability to produce novel and valuable ideas) disappears. Studies suggest five other components of creativity: expertise, imaginative thinking skills, a venturesome personality, intrinsic motivation, and a creative environment. The brain regions supporting the convergent thinking tested by intelligence tests (requiring a single correct answer) differ from those supporting the divergent thinking that imagines multiple solutions to a problem (such as how many uses you can think of for a brick).

Emotional Intelligence

- ▶ Lectures: Myths About Emotional Intelligence; Emotional Intelligence: An Ability or Collection of Eclectic Traits?; Fostering Children's Emotional Intelligence; Intelligence, Self-Discipline, and Academic Performance
- ▶ Exercises: Ten Facets of Emotional Intelligence; Emotional Intelligence Scale; "Reading the Mind in the Eyes" Test: Sample Items

33-5. *Describe the four components of emotional intelligence, and discuss criticisms of this concept.*

Distinct from academic intelligence is **social intelligence**, an aspect of which is **emotional intelligence**. The four components of emotional intelligence are (1) the ability to *perceive* emotions (to recognize them in faces, music, and stories), (2) to *understand* emotions (to predict them and how they change and blend), (3) to *manage* emotions (to know how to express them in varied situations), and (4) to *use* emotions to enable adaptive or creative thinking. Those who are emotionally smart often succeed in careers, marriages, and parenting where other academically smarter (but emotionally less intelligent) people fail. Critics of the idea of emotional intelligence argue that we stretch the idea of intelligence too far when we apply it to emotion.

Is Intelligence Neurologically Measurable?

► Lecture: Reaction Time, Intelligence, and Longevity

33-6. *Describe the relationship between intelligence and brain anatomy.*

Several studies report a positive correlation (+.33) between brain size (adjusted for body size) and intelligence score. Moreover, as adults age, brain size and nonverbal intelligence test scores fall in concert. Other studies suggest that highly educated people die with more synapses. The direction of the relationship between brain size and intelligence remains unclear. Larger brain size may enable greater intelligence, but it is also possible that greater intelligence leads to experiences that exercise the brain and build more connections, thus increase its size. Or, some third factor may be at work. Some evidence suggests that highly intelligent people differ in their *neural plasticity*.

33-7. *Discuss findings on the correlations between perceptual speed, neural processing speed, and intelligence.*

People who score high on intelligence tests tend to retrieve information from memory more quickly. Research also suggests that the correlation between intelligence score and the speed of taking in perceptual information tends to be about +.3 to +.5. Those who perceive quickly are especially likely to score higher on tests based on perceptual rather than verbal problem solving. The brain waves of highly intelligent people register a simple stimulus, such as a flash of light, more quickly and with greater complexity. The evoked brain response also tends to be slightly faster when people with high intelligence rather than low intelligence scores perform a simple task, such as pushing a button when an *X* appears on the screen. As yet, psychologists have no firm idea of why fast reactions on simple tasks should predict intelligence test performance.

