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## Multiple Intelligences: Howard Gardner

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As part of a large collaborative project begun at Harvard University in the late 1970s, Howard Gardner (1943– ) began his examinations of human potential. In 1983, he published his seminal book *Frames of Mind*, which was republished in new editions in 1993 and 2003. His theory of multiple intelligences asserts that human intelligence is best conceptualized as a constellation of relatively autonomous cognitive competencies. These discrete intelligences allow individuals "to solve problems, or to create products, that are valued within one or more cultural settings" (Gardner, 1983/1993, p. x). The original seven intelligences are (1) linguistic, (2) logical-mathematical, (3) spatial, (4) bodily-kinesthetic, (5) musical, (6) interpersonal, and (7) intrapersonal. Gardner refined his theory after its original publication, proposing naturalist and existential intelligences as potential additions (Gardner, 1999, 2006). This entry discusses Gardner's criteria for an intelligence, the elements of each intelligence, and criticisms of multiple intelligence theory.

Multiple intelligence theory challenges traditional psychometric approaches to the study of intelligence in that it does not rely on cognitive tests and close examination of the correlations among test scores. Instead, Gardner's theoretical rationale is rooted in neurological, evolutionary, and cross-cultural evidence. He derived this conceptualization of intelligence in part from his experiences working with members of extreme populations, in which certain cognitive abilities are preserved (often to a remarkable degree) even in the absence of other, very basic abilities. For example, some autistic savants display extraordinary musical or mathematical abilities despite severely impaired language development and social awareness. This suggested to Gardner that music, math, language, and social awareness might be powered by different (metaphorical) reservoirs of mental energy. Likewise, individuals with localized brain damage often demonstrate severe deficits that are circumscribed to a single cognitive domain or ability (Gardner, 1983/1993/2003). For example, some individuals who have experienced stroke or trauma in particular areas of the brain may lose their ability to recognize faces, but nothing else. This condition, called *prosopagnosia*, also suggests that human intellectual ability may be more differentiated than mainstream conceptualizations of intelligence acknowledge.

Gardner articulated several inclusion criteria for candidate intelligences, although he was also clear that meeting all of the criteria perfectly is probably not realistic. The criteria include (a) potential isolation by brain damage (as in *prosopagnosia* and many other syndromes); (b) existence of individuals with exceptional but uneven profiles of abilities (e.g., savants and prodigies); (c) identifiable core information-processing mechanisms that correspond to a particular intelligence (based on neurological findings); (d) a distinct developmental trajectory in humans, along with definable "end-states," that makes it possible to identify both novices and experts within a given domain; (e) an evolutionary history that suggests that a particular intelligence has evolved within humans over time or is present in lower life forms (e.g., birdsong and musical intelligence); (f) experimental support; (g) psychometric support; and (h) encoding in a symbol system (e.g., music, language, and mathematics can be communicated symbolically).

## The Intelligences

*Linguistic intelligence* enables individuals to read, write, and speak well. It holds up well as a candidate intelligence in that it can be isolated by brain damage (e.g., to

Broca's or Wernicke's areas); linguistic prodigies and savants exist in the population; neuroscientists have identified specific linguistic information-processing systems in the brain; it has a distinct developmental trajectory and an evolutionary history in our species. And of course, language is encoded in many symbol systems.

*Logical-mathematical intelligence* encompasses logical thinking (as might be used in chess or deductive reasoning) as well as mathematical and scientific problem solving. Like language, it too can fall victim to isolated brain damage, creating a set of conditions that fall under the heading "dyscalculia" (analogous to "dyslexia" for language). Savants with autism often display remarkable mathematical prowess, as do nondisabled children who have been identified as math prodigies. Math ability is evidenced in developmental and evolutionary histories, and it also is codified in many symbol systems.

*Spatial intelligence* makes its appearance when an individual navigates an unfamiliar set of streets or when an architect visualizes his or her plans for a building. Many mainstream intelligence tests assess spatial ability by asking examinees to mentally rotate an object by a specified number of degrees and then select its image from several options on a page. Thus, there is ample experimental and psychometric support for its existence. There is some evidence for a developmental trajectory (e.g., Piaget & Inhelder, 1956) and copious neurological evidence for visual–spatial processing systems in human and nonhuman brains. Damage to the right parietal lobe of the brain can cause serious problems with spatial reasoning while leaving other abilities (e.g., language) intact.

*Bodily-kinesthetic intelligence* is necessary for problem solving that requires the individual to use his or her physical body, as would be necessary for performing a complex surgical procedure, executing a series of dance steps, or catching a fly ball. Some syndromes and brain traumas can disable a person's ability to use the physical body, leaving intelligence otherwise intact. Tool use among nonhuman animals and precursors to *Homo sapiens* demonstrate a clear evolutionary history. A developmental trajectory is clear as human children develop fine and gross motor skills. Dance can be thought of as a symbol system that communicates meaning through movement.

*Musical intelligence* generates the set of skills that allow musicians to play a tune by ear or to execute a phrase with sensitivity and grace. Savants and prodigies sometimes demonstrate remarkable musical ability, in a way that is quite out of proportion with their other abilities. The development of musical ability in humans follows a predictable developmental sequence, and there is abundant evidence of an evolutionary history (e.g., birdsong). Patients who have Alzheimer's disease can often sing long after they have lost the ability to speak, and some nonverbal stroke patients can be taught to sing. Like the other intelligences, music has a highly structured symbol system that can be used for communicating and receiving meaning.

*Interpersonal intelligence* drives social skills and things like empathy and intuition about what motivates other people—a type of understanding that is necessary for salespersons, teachers, and clergy, for example. The evolutionary history of this intelligence can be seen in all relational animals. Its developmental trajectory in humans is evidenced as young children move from preoperational egocentrism to an awareness that other people have minds separate from their own (e.g., Piaget & Inhelder, 1956). It is arguable that interpersonal intelligence is what is lacking in certain

people with autism spectrum disorders; confused by complex social rules and expectations, they are otherwise highly capable individuals. Intrapersonal intelligence involves a similar set of abilities, but these are turned toward the self; individuals who have high intrapersonal intelligence have an accurate self-understanding and can use this to their advantage in problem solving.

Since his initial proposal of the seven intelligences, Gardner (1999, 2006) has added two more candidates, *naturalist* and *existential*, while largely dismissing the idea of the promising candidate spiritual intelligence. Individuals with high naturalist intelligence have the ability to identify and classify patterns in nature and often show unusual interest in the natural world early in life. People who possess high existential intelligence are better able than most to make sense out of the "ultimate" concerns of human beings, such as the meaning of life and death, or the puzzle of the existence of single individuals in a vast and empty universe. Although Gardner proffers this final intelligence very cautiously, the limited evidence that has been gleaned suggests that it meets the same empirical criteria as the original seven.

The relative cultural value assigned to various intelligences is also a matter of interest and concern to Gardner and others who support multiple intelligence theory. Gardner (1993/2003) asserted that logical-mathematical and linguistic intelligences are overemphasized in traditional models of human intelligence but that this may be a cultural artifact; in different cultural circumstances, other intelligences would take on a higher significance. For example, spatial intelligence might have precedence in a hunter-gatherer culture, where navigation across terrain is paramount to survival. In the 21st century, spatially impaired individuals can rely on GPS (global positioning system) devices to find their way home. As such, difficulty with spatial tasks may have relatively little impact on their ability to live a rich, full life. However, people with language or math challenges often face considerable challenges in the academic and professional realms.

**Criticisms of Multiple Intelligence Theory**

Gardner's theory of multiple intelligences has been widely embraced by educators, in particular classroom teachers. This is perhaps because it provides a framework for articulating and operationalizing what many, perhaps especially teachers, want to believe about human beings: That is, we are all unique, and we each have the potential to be excellent in different areas. This popular interpretation of multiple intelligence theory almost certainly is not shared by Gardner. But this is how it is often viewed.

Scholars working in psychology have been far less willing to embrace this novel approach to intelligence theory. The criticism is probably not surprising given that this theory differs so substantially from previous efforts to understand the human intellect. Some criticism stems from the relative lack of psychometric support. Some of the proposed intelligences do not easily lend themselves to psychometric assessment, and there are methodological issues with many traditional assessments that tend to bias results against multiple intelligence theory. For example, compare the conflicting results of recent attempts to assess the intelligences, such as Almeida et al. (2010); Castejon, Perez, and Gilar (2010); and Plucker, Callahan, and Tomchin (1996). Some critics have suggested that the intelligences are better conceptualized as talents or abilities. Jensen (1998, p. 129), in a wide-ranging critique, finds Gardner's criteria to be too vague or "elastic," arguing that many of the intelligences as currently described are not sufficiently

distinguishable from the general intelligence (*g*) found in many experimental and psychometric settings.

Gardner himself has publicly addressed many of these criticisms (see, e.g., Gardner, 1995, 2006), but it is probably safe to conclude that mainstream psychologists who value traditional psychometrics find multiple intelligence theory to be severely wanting; however, educators and psychologists who favor culturally derived, contextualized developmental theories find a lot to like in Gardner's approach to intelligence.

***See also***Abilities, Measurement of; Intelligence: History and Controversies

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**Further Readings**

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