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Montessori and Gardner's theory of multiple intelligences

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The revolutionary work of Howard Gardner has been given much attention in the past decade. Opposing the notion of a unitary IQ and proposing that intelligence be thought of as a wide range of human capabilities, Gardner challenged the status quo in the field of psychology. Many years before his time, however, Maria Montessori also challenged the status quo regarding human abilities and potential, demonstrating that children who were "slow," deprived, and poor could thrive and grow under the right set of conditions. This article attempts to review Gardner's theory of Multiple Intelligences, show how Montessori and Gardner drew similar conclusions regarding human capacity and potential, and examine how Gardner's eight intelligences and underlying core operations lie at the heart of the Montessori exercises and activities.

In *Frames of Mind: The Theory of Multiple Intelligences*, written in 1983, Howard Gardner defined intelligence as "the ability to solve problems or to create products that are valued within one or more cultural settings" (1999, p. 33). Revising his definition in 1999, he defined intelligence as "a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (p. 34). Gardner sees intelligences as potentials, possibly neural ones, that may or may not be activated depending upon the values of a culture, the opportunities available in that culture, and the personal decisions made by individuals and/or their families, teachers, and other members of the society.

Gardner (1999) applied the following eight criteria derived from disciplines such as biology, anthropology, psychology, and psychometrics to determine if a mental faculty could be classified as a human intelligence:

* the potential isolation by brain damage;

- * an evolutionary history and evolutionary plausibility;
- * an identifiable core operation or set of core operations;
- * susceptibility to encoding in a symbol system;
- * a distinct developmental history, along with a definable set of expert "end-state" performances;
- * the existence of idiot savants, prodigies, and other exceptional individuals;
- * support from experimental psychological tasks;
- * support from psychometric findings.

Gardner identified eight human intelligences (see Table 1), each one having certain core operations-capacities that seem central to an intelligence, for example, as phonemic discriminations would be to linguistic intelligence or mental calculations of numbers would be to logical-mathematical intelligences. He believes these capacities are likely to be mediated by specific neural mechanisms and triggered by relevant internal or external types of information.

Gardner originally described seven intelligences and then several years ago added an eighth. He believes that all human beings possess the eight different intelligences, that each person has a unique blend of intelligences, and that no two people have exactly the same profile of strengths and weaknesses with respect to intelligences. He also points out that strength in one area of intelligence does not predict strength or weakness in other areas. Gardner also believes that any intelligence can be enhanced by concerted effort.

Table 2 presents Gardner's description of the eight intelligences and examples of end-state performances. Gardner is still considering other possible candidates as intelligences, including existential intelligence, observed in individuals concerned with questions regarding life's meaning and issues of human existence.

Shared Conclusions

Although working in different cultures and different times, Montessori and Gardner came to many of the same conclusions regarding human development. First, both Montessori and Gardner derived their theories based upon daily, firsthand observation and experience working with people, both normal and with exceptionalities. Montessori worked first with retarded, then urban, deprived children. Gardner focused his attention upon adults with various forms of brain damage, as well as normal and gifted children. These experiences enabled them both to understand and appreciate the wide range of abilities and capacities found in human nature and to challenge rigid and narrow beliefs about human potential.

Second, as a result of their shared understanding and appreciation of human nature, both Montessori and Gardner noted the uniqueness of each individual. They observed that individual differences begin to be revealed in the earliest years of life, and that individual strengths in one area of ability do not necessarily ensure or predict strengths in other areas. Montessori writes, "little children soon reveal profound individual differences which call for very different kinds of help from the teacher" (1964, p. 23 1). Gardner (1997, 1999) states that in the area of intelligence, no two people have exactly the same intelligences, nor in the same combination, and that understanding and valuing these uniquenesses and differences and utilizing them for the benefit of society is of utmost importance. He states, in fact, that taking human differences seriously lies at the heart of Multiple Intelligence Theory.

Third, for both Montessori and Gardner, the interaction of nature and nurture plays a significant role in the development of human capabilities. With respect to genetic heritability, Montessori observes that the origins of development lie within the individual and that children seem to possess what she calls natural tendencies.

In a similar vein, Gardner posits that human abilities, like human differences, have a genetic base. Both Montessori and Gardner, however, see human development as the result of an ongoing and dynamic interaction between genetic and environmental factors. Montessori (1995) strongly believed that the child's mind absorbs the environment, leaving lasting impressions upon it, forming it, and providing nourishment for it. She warned that the quality of the environment can greatly enhance a child's life or seriously diminish it.

Gardner, too, emphasizes the importance of the environment on the development of human capabilities. Gardner believes that the "smarter" the environment and the more powerful the interventions and resources, the more competent individuals will become and the less important will be their particular genetic inheritance. He asserts that even individuals who seem gifted in a specific intelligence will accomplish little if they are not exposed to resources and materials that support that intelligence.

Differences In Focus

Despite similarities in their viewpoints, Montessori and Gardner differ to some degree in the focus of their work.

First, from the beginning of her career, Montessori was concerned with the education and welfare of children, especially poor children. Her concern and passion for the needs of children translated directly into the establishment of a school, the development of a teaching method, a curriculum, didactic materials, parent education, teacher training, and social action in the community. Montessori based her philosophy and methodology on her work with children and teachers and, in turn, her developing philosophy and methodology influenced her practice.

In contrast, Gardner's work from its inception was theoretical, based upon observation and research, not practice. His work led him to the redefining of human intelligence and the construction of a new theory of human intelligence. Gardner did not develop a specific educational approach or specific application of multiple intelligence theory to practice, nor view his theory as an educational prescriptive. He believes that educators should determine how multiple intelligence theory should guide their practice and warns against superficial or self-serving applications of the theory in educational settings.

Second, Montessori's philosophy, theory, and method encompass all aspects of human potential, including character, moral development, and spiritual growth. She writes, "Our educational aim with very young children must be to aid the spontaneous development of the mental, spiritual and physical personality" (1964, p. 230).

Gardner's focus, however, remains specifically on those areas of human potential he has defined as intelligences, in their various forms and combinations. Although he has considered character, moral, and spiritual issues in his work, they are not considered a part of Multiple Intelligence theory because they do not meet his criterion for an intelligence.

Long before the introduction of Piaget's cognitive-developmental theory of children's intelligence, Kohlberg's theory of moral development, and Gardner's theory of multiple intelligences, Maria Montessori (1912) wrote about a method and curriculum for the teaching and development of young children. In the description of her method and techniques, she reveals her deep regard for all aspects of the child's development and profound respect for the innate, unique potential she sees within each individual child, needing only the right environment to encourage what is within to evolve.

Montessori realized the significance of each area of human potential or intelligence in the experiences and materials she created for the children in her school. She seems to have created her exercises to touch upon many of the core operations of the eight intelligences described by Gardner and created multisensory experiences which activate combinations of intelligences. For example, a Montessori mathematics lesson on the geometric solids uses bodily-kinesthetic intelligence in feeling the forms, visual/spatial in observing and internalizing images of the forms, logical-mathematical intelligence in establishing relations between them, naturalistic intelligence in observing and classifying them, and linguistic in labeling them. If the child did this activity with other children, he or she could also exchange ideas about the forms and share them, thus utilizing interpersonal intelligence.

Table 3 is an analysis of Montessori's curriculum as it relates to Gardner's eight intelligences. A brief overview of the Montessori curriculum areas indicates how each of the materials encompasses at least one intelligence and several core operations. For example, the Practical Life area exercises combine the use of Bodily-kinesthetic and Spatial intelligences. The Sensorial exercises include many of the intelligences, such as Bodily-kinesthetic, Spatial, Logical-mathematical, Naturalist, Linguistic, and Interpersonal, if children are working together. Language exercises utilize Bodily-- kinesthetic, Spatial, Linguistic, and Interpersonal intelligences, and mathematics. Nature and Social Studies engage Naturalist, Bodily-kinesthetic, Logical-mathematical, Spatial, Interpersonal, and

Linguistic intelligences. Art, Gymnastics, and Music involve Bodily-kinesthetic, Logical-mathematical, Spatial, and Musical intelligences.

Montessori addressed the personal and social life of the child, as well. For example, she wrote extensively about the importance of self-knowledge and self-regulation, (Gardner's Intrapersonal intelligence). She writes: "We call an individual disciplined when he is master of himself and can, therefore, regulate his own conduct when it shall be necessary to follow some rule of lifeEach one of [the children] perfects himself through his own powers, and goes forward guided by that inner force which distinguishes him as an individual" (1964, p. 86).

Many Montessori activities and exercises support the development of independence, decision-making, self-control, mastery, and discovery. She also recognized that children need to function in a social world and in community with others. By developing self-care skills, self-control, manners, good habits, and polite conversation, Montessori prepared her children to enter into human society. But more important was that her children learned to respect each other, help and teach one another, and share and enjoy games, activities, and music. These practices and activities of the Montessori classroom encompass aspects of what Gardner calls Interpersonal intelligence.

In Summary

This article has provided an updated overview of Howard Gardner's Theory of Multiple Intelligences and pointed out ways in which Maria Montessori and Howard Gardner, although differing in the focus of their work, came to very similar conclusions about human abilities and potentials. The exercises and activities in Montessori's curriculum engage many of the core operations in the eight intelligences described by Gardner.

Both Maria Montessori and Howard Gardner were revolutionary figures in their fields. By challenging the status quo, they have brought us to a greater understanding of the potential of human beings through their gift of penetrating observation and analysis of little children and adults with exceptionalities.

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