

PUBLIC PERCEPTIONS OF MONTESSORI EDUCATION

BY

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Abstract

This study provides insight into the American public's perceptions of Montessori education one hundred years after its inception. The study is based on responses from an online survey with 1,520 members of an internet panel which was stratified to reflect the U.S. population based on age, ethnicity, gender, region, and income. The study answered research questions regarding how much the general public knows about Montessori education, perceptions of Montessori education and the attitudes and demographic characteristics that are associated with positive perceptions of Montessori education. The study found high awareness of the term "Montessori," but lower knowledge of the specifics of Montessori education. Generally favorable perceptions of Montessori education were also discovered along with less widespread evidence of commonly reported criticisms. Finally, and not surprisingly, familiarity with Montessori education led to more positive opinions of Montessori education as did stronger beliefs that schools should play a role in children's development beyond academics.

Dedication

This work is dedicated to my children, Duncan and Amelia, whose quick minds, boundless enthusiasm, and breathtaking potential inspired me to pursue the study of psychology and research in education.

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Chapter 1: Introduction

By the time Montessori education celebrated its centennial in 2007, an estimated 5,000 Montessori schools existed in the United States, including 300 public schools (Lillard, A. & Else-Quest, 2006). While many people may recognize the Montessori name because of the number of schools across the country and around the world that bear it, anecdotal evidence suggests that the general public has a limited understanding of the Montessori approach to education. Authors characterize the limited knowledge of Montessori education in the general public by citing conflicting criticisms that Montessori education is either too rigid and robs children of creativity or that it is completely unstructured and without any academic standards (Chattin-McNichols, 1998). In order to address this lack of understanding, the American Montessori Society (AMS) launched a multifaceted campaign in 2005 to educate the public about the value of Montessori education (American Montessori Society. n.d.b). The campaign, dubbed the “Montessori Initiative,” includes public relations and marketing campaigns as well as a new magazine for Montessori families (American Montessori Society. n.d.b).

Montessori education is an individualized approach with a long-term perspective. Children remain with the same teacher in multiage classrooms for three years, allowing for continuity in the learning experience. In this environment,

children work at their own pace with opportunities for cooperative learning while working in small, mixed age groupings according to ability and interest (Charlap, 1999). Montessori programs typically limit the emphasis on whole group instruction, grades and tests and instead focus on student-chosen work with specially designed materials during long blocks of uninterrupted time (Lillard, A. & Else-Quest, 2006). Even though a large proportion of Montessori schools are preschools, Montessori programs exist for children of all ages ranging from infants through high school (Lillard, A. & Else-Quest, 2006).

The purpose of this study was to gauge the general public's knowledge of these and other aspects of Montessori education as well as their perceptions of its effectiveness. Specifically, this study answered research questions regarding (1) How much does the general public know about Montessori education? (2) What are the general public's perceptions of Montessori education? and (3) What attitudes and demographic characteristics are associated with positive perceptions of Montessori education?

Chapter 2: Review of Literature

The Montessori Method of education was originated by Maria Montessori (1870-1952), Italy's first female physician over one hundred years ago (Hainstock, 1997). The initial elements of her method were developed through astute observation of children's behavior while working with disadvantaged children in the worst slum in Rome (Shute, 2002). She integrated close observation of children's behavior with her scientific knowledge of children's growth and development to create a framework for an educational approach that she believed would lead all children to become self-motivated, independent and lifelong learners (American Montessori Society, n.d.a). Her ideas that children learn through hands-on activity and that critical brain development occurs during the preschool years were considered quite radical in Montessori's day but are now widely accepted educational principles (Shute, 2002).

Montessori Philosophy

Based on her study of children, Maria Montessori constructed a philosophy of psychological development she believed children would follow if they were given freedom in an appropriate environment (Lillard, P., 1972). She believed that children possess natural tendencies that enable them to fulfill their own optimal development (Lillard, P., 1972). These developmental tendencies include: a desire and tendency for

meaningful work, attention, independence, and, ultimately, self-discipline (Lillard, P., 1972). These are the basic psychological principles of development which she believed would lead to development of intelligence, creativity, and emotional and spiritual awareness (Lillard, P., 1972). Thus, Maria Montessori's philosophy of child development clearly encompassed the whole child rather than only his academic achievement. The paragraphs that follow outline the developmental tendencies Maria Montessori identified and how they form the basis for the Montessori Method of education.

Desire for work. Maria Montessori believed that discovering a child's need for meaningful work was one of the most important developmental principles she identified (Lillard, P., 1972, p. 37). She believed that a child "prefers a disciplined task to futile idleness" and that, in fact, a child will suffer from the "normal" lines of construction if he is in an environment without opportunities to exercise his desire for work (Montessori, 1966, p. 148). "A child's desire to work," she said, "represents a vital instinct since he cannot organize his personality without working: *a man builds himself through working*" (Montessori, 1966, p. 186).

In order to characterize the work of the child, Maria Montessori contrasted it with the work of an adult by pointing out the adult's emphasis on accomplishing goals through work whereas, "When a child works, he does not do so to attain some further goal. His objective in working is the work itself..." (Montessori, 1966, p. 196). She illustrated another distinction between adult work and that of a child in

discussing an adult's desire for efficiency in accomplishing a task in order to minimize fatigue. She said, "A child, on the other hand, does not become weary with toil. He grows by working and, as a consequence, his work increases his energy" (Montessori, 1966, p. 197).

Maria Montessori's views on pretend play were based on her ideas regarding the importance of meaningful work in a child's development (Lillard, A., 2005). She believed that fantasy had no place for children under the age of six because the goal of young children is learning to perceive and understand the real world. Furthermore, she believed that games such as playing house represented a child's desire to participate in the important work of the family rather than his desire to imitate the behavior of adults through fantasy play (Lillard, A., 2005). As a result, Montessori preschool classrooms do not typically have a dress-up or housekeeping area. They also tend to use nonfiction books and to avoid books with cartoon characters talking animals, or other fantastic creatures (Lillard, A., 2005). Montessori education introduces fantasy at the elementary level when Maria Montessori believed children had a well developed sense of the difference between fantasy and reality (Lillard, A., 2005).

Independence. Autonomy is another cornerstone of Montessori education at all levels because the philosophy is based on a fundamental belief that children are best able to guide their own development when they are given the freedom to do so (Lillard, P., 1972). Montessori's faith in the child's ability to guide his own

development was closely linked to her belief that the child would naturally choose the most meaningful work to fulfill his developmental needs. Maria Montessori believed children develop best when adults do not do things for them and instead respond to the child's inner need to "Help me to do it alone!" (Montessori, 1966, p. 198).

Rambusch and Stoops (1992, p. 38) consider self directed education "fueled by the need to be competent" as essential to authentic Montessori learning activity.

Attention. Maria Montessori (1995, p. 222) herself said, "The first essential for the child's development is concentration. It lays the whole basis for his character and social behavior." As a result, the Montessori Method of education was designed to provide the child with an engaging environment that allows him the freedom to exercise his powers of concentration. Maria Montessori believed that children should have opportunities to perform meaningful work independently and for as long as necessary until they reach a satisfactory conclusion to their cycle of work (Lillard, P., 1996). Maria Montessori said, "...when he has repeated an exercise and brought his own activities to an end, this end is independent of external factors" (Montessori, 1966, p. 196). Furthermore, she emphasized that fatigue is not the driving force behind a child's completing his work, saying, "As far as the child's personal reactions are concerned, his cessation from work is not connected with weariness since it is characteristic of a child to leave his work completely refreshed and full of energy" (Montessori, 1966, p. 196).

Self-discipline. Maria Montessori believed that a child learning self-control is a process (Lillard, P., 1972, p. 40). After achieving a certain level of concentration through independent work, she observed that children tended to repeat the cycle of an exercise many times with a sense of satisfaction, independence and growing self-confidence (Lillard, P., 1972, p. 41). Once mastering the ability to persevere in a task, Montessori saw emerging self-discipline as the next step in the development of the will (Lillard, P., 1972, p. 41). She believed self-discipline allowed the child to creatively use his abilities and accept responsibility for his actions (Lillard, P., 1972, p. 41). Maria Montessori said, “Making use of his own will in his contact with his environment, he develops his various faculties and thus becomes in a sense his own creator” (Montessori 1966, p. 33). A well known Montessorian, Paula Polk Lillard (1996, p. 23), linked the child’s development of self-discipline to freedom, “To be free means to be in control of self, to be able to do what one chooses to do, not what one’s feelings or illogical thoughts of the moment may dictate.” Rambusch and Stoops (1992) consider children exercising the self-discipline required to initiate and persist in work to be essential to authentic Montessori learning activities. Furthermore, Maria Montessori believed tying extrinsic rewards to an activity negatively impacts the development of the self-discipline required to engage in an activity when the reward is withdrawn (Lillard, A., 2005). Instead, Maria Montessori argued that students develop intrinsic motivation when the learning activity itself is its own reward (Rambusch & Stoops, 1992).

In summary, Maria Montessori identified internal psychological dispositions which she believed children use for guiding their own development when their efforts are not thwarted by adults. She said, "...the guiding principle for human development is a personal energy contained within the child" (Montessori 1966, p. 32). She argued that "Actually the normal child is one who is precociously intelligent, who has learned to overcome himself and to live in peace, and who prefers a disciplined task to futile idleness" (Montessori, 1966, p. 148). Montessori used the term "normalized" to describe children who have developed independence, concentration, and self-discipline through meaningful work (Lillard, P., 1972, p. 37-38). Her concept of normal child development forms the philosophical foundation for the educational practices of the Montessori Method discussed in the next section.

Montessori Method

Maria Montessori's most enduring contribution to the field of education is the comprehensive method she developed to implement her philosophies (Lillard, P., 1972, p. 50). The Montessori learning environment and the Montessori teacher comprise the key elements of the Montessori Method (Lillard, P., 1972, p. 50).

Montessori environment. As discussed previously, Montessori philosophy proposes that learning is the process of the child constructing his own potential through his own efforts (Lillard, P., 1996). Maria Montessori emphasized the importance of providing children with a "prepared" environment to enable them to

have the freedom to develop optimally (Lillard, P., 1972, p. 51). She said, “It is through the environment that the individual is molded and brought to perfection” (Montessori, 1966, p. 35). Thus, the Montessori environment is designed to provide children with the freedom, structure, materials, and supportive community for their own self-construction (Lillard, P., 1972, p. 51).

Montessori students have the freedom to exercise control over many aspects of their daily lives and learn to attribute success and failure to their own actions based on direct experience with the consequences of their decisions (Lillard, P., 1972). This freedom is most apparent in the degree of control students have over choosing their own work during an uninterrupted block of work time (Lillard, P., 1996). During a one-and-a-half to three-hour block of time, children of all ages are free to select any work on which they have received a lesson (Lillard, P., 1972). Each student works individually or in a small group at his own pace and at his own level. Students may decide if they will start the day with less demanding tasks and gradually build up to their big work of the day. Or, they can decide to immediately dive into a long term project they have been working on for days or weeks. The uninterrupted work cycle relies heavily on Montessori’s belief in the child’s natural desire and tendency for meaningful work (Lillard, P., 1972).

In order to support the child’s freedom, Montessori environments emphasize structure and order (Lillard, P., 1972). Materials within classrooms are arranged according to area of interest and in order of graduated difficulty (Lillard, P., 1972,

p. 56-57). This organization facilitates the child's freedom to choose and successfully complete his work (Lillard, P., 1972, p. 57). Materials are maintained so that none of the pieces are broken or missing, and children are expected to carefully return materials to their proper place for others to use (Lillard, P., 1972, p. 57). In this way, Montessorians involve children as caretakers of their classroom environments with responsibility for maintaining order (Lillard, P., 1972).

Some of the most recognized aspects of the Montessori environment are the unique, hands-on materials (Lillard, P., 1972, p. 59). In fact, Rambusch and Stoops (1992, p. 35) list first-hand experience with the materials as a key element in authentic Montessori learning activity. These materials provide the foundation for the freedom possible in a Montessori classroom. The materials on the shelves facilitate independent work because "the whole of [the] child's path to independent discovery" is available on the shelves (Lillard, P., 1996, p. 57).

Montessori materials facilitate an individualized approach to learning because they are "the means to personal formation for each child" (Lillard, P., 1996, p. 57). Montessori children move through the materials and curriculum at their own pace rather than on an external timeline because "each child comes with his or her own interests and capacities" (Lillard, P., 1996, p. 72). Paula Polk Lillard (1996, p. 57-58) notes that, "Not every child will work with every material to the same extent, and some children will go much deeper in their search for knowledge in specific areas than others." Montessori teachers look for windows of opportunity for introducing

new materials based on observation and experimentation to ensure maximum meaningfulness to the child (Lillard, P., 1972, p. 61).

To maximize meaningfulness, Maria Montessori suggested teachers recognize that children progress through “Sensitive Periods” which correspond to their individual developmental needs at a particular time (Lillard, P., 1972, p. 32). Paula Polk Lillard (1972, p. 32) describes Sensitive Periods as “blocks of time in a child’s life when he is absorbed with one characteristic of his environment to the exclusion of all others.” Examples of sensitive periods include, use of the hand and tongue, the development of walking, a fascination with minute and detailed objects, and a time of intense social interest (Lillard, P., 1972, p. 33). She believed responding to these sensitive periods was crucial for matching the child with materials which would aid his development, particularly the ability to concentrate (Lillard, P., 1972). She said,

He must find out how to concentrate, and for this he needs things to concentrate upon. This shows the importance of his surroundings, for no one acting on the child from the outside can cause him to concentrate. ...None of us can do it for him. (Montessori, 1995, p. 222).

In addition to fostering concentration skills and independence, the concrete Montessori materials are designed to allow children to create an inner picture of complex concepts which will serve them for a lifetime (Lillard, A., 2005). Montessorians believe that young children are very limited in their ability to think abstractly, so Montessori students rarely rely on tests and workbooks (Seldin, 2000). Furthermore, the Montessori materials are not simply visual aids used for demonstrating concepts. Instead, the child’s learning takes form through his repeated,

individual use of the materials (Lillard, P., 1996). Montessori experts have described the use of the materials as “a creative process undertaken by the child to construct her own knowledge” (Chattin-McNichols, 1998, p. 97). While some of the Montessori materials resemble manipulatives used in other classroom situations, their prominence and individual use are unique in a Montessori classroom.

The emphasis of the classroom community is another unique feature of Montessori education. Since Montessorians believe that learning reaches its fullest potential in a socialized context, the classroom community is crucial to the Montessori environment (Rambusch & Stoops, 1992). Paula Polk Lillard (1972, p. 74) claims that “The spontaneous creation of a community children is one of the most remarkable outcomes of the Montessori approach.” Teachers are not the driving force, but they enable children to manage their own community in a variety of ways (Seldin, 2000). Children begin to feel ownership toward the classroom environment because they are a key source of its daily maintenance through returning materials to their proper places, polishing tables, and caring for plants and animals (Lillard, P., 1972).

Another source for the development of community life comes from the sense of responsibility children come to feel for one another due, at least in part, to the mixed age structure of Montessori classrooms (Lillard, P., 1972). Traditionally, Montessori classes are comprised of children spanning a three-year age band with children remaining in the same classroom with the same teacher for three years

(Seldin, 2000). Even in the preschool classes, older children naturally help their younger classmates (Lillard, P., 1972). Elementary children of various ages are encouraged to collaborate and work together (Seldin, 2000). This structure is predicated on Montessorians' belief that collaborative arrangements are conducive to learning (Lillard, A., 2005).

Furthermore, the individualized nature of the curriculum and lack of traditional grading are conducive to cooperation rather than competition (Rambusch & Stoops, 1992). Cooperation among Montessori children is reinforced through establishing a climate of mutual respect for the needs of each individual child. For example, Montessori classrooms typically have only one specimen of each of the materials available to the children (Hainstock, 1997). When one child wishes to use an activity in which another child is engaged, he must wait his turn and respect the other child's work. Since children encounter this situation regularly, they gain much practice in appreciating the rights of others through patiently waiting their turn. Maria Montessori believed that when children experience an environment in which they are treated with dignity, respect and kindness, and they will naturally treat others likewise (Seldin, 2000).

Montessori teacher. Along with the environment, the teacher is the other crucial element in the Montessori Method (Lillard, P., 1972). In fact, the key responsibility of the Montessori teacher is to be the “designer, organizer, preparer” of an “appropriate social and cognitive environment for children” (Rambusch & Stoops,

1992, p. 38). The role of the Montessori teacher is not to impart knowledge but to indirectly “set free the individuals’ own potential for constructive self-development” (Lillard, P., 1972, p. 77). As a result, the term “teacher” is avoided in some Montessori schools in favor of the term “guide” to emphasize the child's role in his own learning (Chattin-McNichols, 1998, p. 56-58). The arrangement of a Montessori elementary classroom illustrates the reduced emphasis of the teacher as the focal point. There is typically no desk at the head of the classroom, the teacher is most often found in some corner of the room surrounded by a small group of students discussing their work or giving a lesson (Chattin-McNichols, 1998, p. 56-58).

Another important responsibility of the Montessori teacher is protecting children’s freedom to pursue their own optimal developmental path (Lillard, P., 1972, p. 90). One aspect of this is protecting children’s right to a block of time within which to work. This often means leaving them alone to do their important, independent work (Lillard, P., 1996). The Montessori teacher must protect the children from interruption during this crucial time in order to foster concentration because, as Maria Montessori said, “Interest is not immediately born, and if when it has been created, the work is withdrawn, it is like depriving a whetted appetite of the food that will satisfy it” (Lillard, P., 1996, p. 95). Furthermore, she said, “Praise, help, or even a look, may be enough to interrupt him, or destroy the activity.” (1995, p. 280)

In addition to preparing the environment and protecting children’s freedom, Montessori teachers guide and monitor students’ progress through the graduated

curriculum. The individualized nature of the Montessori curriculum places unique demands on the Montessori teacher. In order to serve as an “effective link to the environment for the children, the Montessori teacher constantly observes the children in order to know where they are in their development at any given moment” (Lillard, P., 1996, p. 91). In this way, teachers utilize their intimate knowledge of students’ abilities to help them progress through the graduated structure of the Montessori curriculum. Montessori education builds on the premise that competence begets confidence. As crucial as following the child’s interests is, monitoring the child’s progress is equally important because “...the secret to maintaining their interest is to keep them challenged” (Lillard, P., 1996, p. 92). Montessorians believe that appropriate levels of challenge are important in maintaining interest and for building upon children’s feelings of competence. Each individual child’s progress is tracked by teachers who follow the child for three years in a multi-age classroom (Lillard, P., 1996, p. 91). This approach facilitates Maria Montessori’s (1965, p. 111-114) recommended method of understanding a child’s progress through “prolonged observation.” Teachers gauge understanding by the way materials are handled, accuracy of written work, ability to transfer concepts to new situations, and demonstrating mastery through one child teaching a concept to another (Charlap, 1999).

Montessori educators downplay or avoid performance goals like grades and competition among students because they believe that these are extrinsic rewards

which diminish a child's intrinsic motivation (Lillard, A., 2005). Rather than relying on grades and testing for student evaluation, Montessori teachers emphasize observing the child's progress through materials of graduated difficulty in conjunction with detailed recordkeeping (Kripalani in Kahn, 1990). Elementary students are also encouraged to gauge their own success based on goals they establish with guidance from their teachers in regular, often weekly, conferences. The consequences for failing to achieve goals tend to be logically related to the situation. Punishment in the form of bad grades is not used as used to coerce behavior (Lillard, A., 2005).

History of Montessori Education in the United States

The Montessori name is familiar today because many schools across the country and around the world include "Montessori" in their names. At present it is estimated that 5,000 Montessori schools exist in the United States, including 300 public schools (Lillard, A. & Else-Quest, 2006). A large proportion of these schools are preschools; however, Montessori programs exist for children of all ages ranging from infants through high school (Lillard, P., 1996). Although many Americans may have heard the Montessori name, few likely understand the origins of Montessori education in this country (Wentworth, 1999).

As education became a popular topic for the proliferating American media in the early twentieth century, the Montessori philosophy of education was reported in

such periodicals as *American Education*, *Journal of Educational Psychology*, *Kindergarten Review*, *Pedagogical Seminar*, *American Primary Teacher* and even *Ladies' Home Journal*, *Woman's Home Companion*, *Good Housekeeping*, and *Scientific American* (Kramer, 1988, p. 159). But, a series of articles in *McClure's Magazine* in 1911 and 1912 were so influential that Montessori education came to the attention of the general public in the U.S. (Kramer, 1988).

High profile support from Alexander Graham Bell and his wife contributed to the American public's curiosity about Montessori education (Kramer, 1988). The Bells established a Montessori class in their home for two of their grandchildren and a small group of neighbors' children in 1912 (Kramer, 1988). The first Montessori school in America, however, had opened in the fall of 1911. The school was started by Anne E. George in Tarrytown, New York after she became the first American teacher trained by Maria Montessori herself (Kramer, 1988). Mrs. Bell subsequently asked Anne George to establish a private Montessori school in Washington D.C., and personally subscribed \$1,000 to help the effort (Kramer, 1988).

By 1913, almost 100 Montessori schools were operating in America, and Maria Montessori's personal popularity was so strong that she was received by large, enthusiastic crowds on her first visit in late 1913 (Kramer, 1988). In fact, one of the largest audiences in history packed Carnegie hall to hear her speak. The New York Sun reported those in the crowd "were eager to hear Dr. Montessori explain how she was able to make children advance rapidly in learning, make them polite, self-reliant

and charming by giving them complete liberty and without rewards or punishments” (Kramer, 1988, p. 194).

Despite growing public interest and high profile support, proliferation of Montessori education in the United States was hindered because only one teacher was qualified to teach children, and Montessori allowed no one but herself to train additional teachers (Kramer, 1988). Thus, a Montessori American Committee was formed in the spring of 1912 which organized the first international training course to be held in Rome in January of 1913. Out of 87 trainees who enrolled in the course, 67 were from the U.S. (Kramer, 1988).

The convergence of the public’s hunger for Montessori education and Montessori’s tight controls on her method spawned many “popularizers and interpreters” (Kramer, 1988, p. 174). Montessori renounced these efforts based on her conviction that these distortions, even if well meaning, would result in oversimplification or misinterpretation of her comprehensive method. On the other hand, her tight controls were ultimately destructive, because, as biographer Kramer (1988, p. 174) said, “There are no monopolies in the commerce of ideas.”

In addition to the challenges of controlling growth, criticism from prominent teacher educator William Heard Kilpatrick also hurt further expansion of Montessori education (Kramer, 1988). Kilpatrick studied Italian to be able to communicate directly with Maria Montessori when they met, but their interactions were strained (Shortridge, 2007). After visiting several Italian Montessori schools, he criticized the

degree of freedom he witnessed as well as the proscribed use of Montessori's didactic materials (Shortridge, 2007). He criticized Montessori education for being behind the times because of its lack of emphasis on imaginative play (Shortridge, 2007). He summarized his assessment of Montessori education in *The Montessori System Examined* which was published in 1914 (Shortridge, 2007). This monograph as well as his public statements contributed greatly to the early academic rejection of Montessori education (Shortridge, 2007). Thus, Kilpatrick's criticism along with limited opportunities for expansion and the outbreak of World War I all contributed to the decline of the initial wave of enthusiasm regarding Montessori education in America (Kramer, 1988).

A second wave of interest in Montessori education began shortly after Maria Montessori's death in 1952 at the age of 81 (Whitescarver & Cossentino, 2006). Leading this new wave of interest was charismatic and influential Nancy McCormick Rambusch (Whitescarver & Cossentino, 2006). She became interested in Montessori education after reading Maria Montessori's writings as an undergraduate at the University of Toronto in the late 1940s. When her first child was born in 1952, Rambusch examined Montessori education seriously as an educational alternative for her own children. She attended the Tenth International Montessori Congress in Paris in 1953. At this gathering she met Mario Montessori, Maria Montessori's son and heir to her educational legacy through the Association Montessori Internationale (AMI) (Whitescarver & Cossentino, 2006). Rambusch was instrumental in

establishing the Whitby School in Greenwich, Connecticut which was the brainchild of a group of affluent and influential Catholic parents (Whitescarver & Cossentino, 2006).

Mario Montessori supported the Whitby School and the establishment of the American Montessori Society (AMS) as an affiliate of the AMI in 1960 with Rambusch as its first president (Whitescarver & Cossentino, 2006). Unfortunately, conflicts between Mario Montessori and Rambusch emerged quickly and came to a critical juncture on the topic of teacher training. Rambusch and the AMS wanted to develop innovations for an Americanized form of Montessori education which the AMI thwarted (Whitescarver & Cossentino, 2006). The rupture was complete in 1963 when Mario Montessori withdrew support for the AMS as the face of Montessori in the United States (Whitescarver & Cossentino, 2006).

Despite these conflicts, Montessori education continued to grow in the U.S. during the 1960s (Whitescarver & Cossentino, 2006). By 1970, AMI affiliated schools numbered 150 and AMS affiliated schools rose to 171 (Whitescarver & Cossentino, 2006). In addition, the AMI's Washington Montessori Institute trained 395 teachers during the period from 1963 to 1970 with seven additional AMI training centers opening. AMS had trained 783 teachers by 1970 (Whitescarver & Cossentino, 2006).

Today, more Montessori schools exist in the United States than in all other countries combined, making it more of an "American export" than a "European

import” (Whitescarver & Cossentino, 2006, p. 49). Montessori has grown as a choice in public schools in the United States due to pressure from parents (Hainstock, 1997). The first Montessori public school was Hilltop Elementary established in 1967 in greater Cincinnati (Gordon, 2005). In the 1980s, Montessori magnet schools experienced a five-fold increase in numbers (Kahn, 1990). In 1993, it was reported that 29 of the 100 largest U.S. school systems offered Montessori programs (MPSC, 1993b). The AMS estimates 325 Montessori programs in charter and public schools today (American Montessori Society, n.d.a).

Montessori Research

Montessori research has historically been limited, but the number of studies has been increasing in recent years. One of the challenges to conducting research on Montessori education is the great diversity that exists across Montessori schools and teachers even among those who are trained and certified by major Montessori organizations like the AMS or the AMI (Lillard, A., 2005). Montessori organizations have begun encouraging well designed research projects to address these challenges. The AMI highlights high profile research studies on the effectiveness of Montessori education on its web site and was one of several sponsors of a long term study of students from Milwaukee public Montessori schools. (This study will be discussed in subsequent paragraphs.) The AMS has made an effort to encourage research through establishing a research committee, publishing research on its web site, and offering

monetary awards to outstanding theses and dissertations each year (American Montessori Society, n.d.a).

Initially, Montessori research focused on the preschool level with an emphasis on Head Start programs. In the late 1960s and early 1970s, a number of studies included Montessori as one of several programs to which preschoolers were randomly assigned in order to assess the effectiveness of various programs for low income students (DiLorenzo, Salter & Brady, 1969; Karnes, Shwedel, & Williams, 1983; Kohlberg, 1968; Miller, Dyer, Stevenson & White, 1975). Although Montessori programs showed superiority on some measures, these studies were of limited value in evaluating Montessori education because of poor or unspecified implementation of the approach (Lillard, A. & Else-Quest, 2006). Furthermore, most studies included programs of only a few months in duration and/or very short daily exposure to the Montessori approach, and many also had very small sample sizes (Chattin-McNichols, 1998).

Several recent studies have come from dissertations and theses. Daoust (2005) examined the implementation of Montessori early childhood practices in a particular region of the U.S. Through semi structured interviews with 66 early childhood Montessori teachers, cluster analysis revealed four subgroups of teachers. The “traditional” group adhered most strictly to authentic Montessori practices. The “contemporary” group followed authentic elements of Montessori education less strictly than the traditional group. The “blended” and “explorative” groups combined

Montessori elements with those typically associated with other models of early childhood education. A key difference between the groups was work period length and percentage of whole group presentations. The author concludes that some teachers were “unaware that they were implementing practices that were inconsistent with the philosophical tenets of the approach” (Daoust, 2005).

Roemer (1999) investigated assessment practices of Montessori teachers with kindergarten through sixth grade students. She addressed the problem that the methods and reasoning behind student evaluations are not well understood. A survey of 108 AMS member schools with elementary programs found that both alternative and traditional assessment practices were used. Montessori schools reported using standardized achievement tests but were not convinced they fit into the Montessori philosophy. Instead, parent-teacher conferences, nongraded report cards, anecdotal records, and student portfolios were used successfully (Roemer, 1999)

Castellanos (2003) compared children from traditional and Montessori elementary programs to investigate how different educational philosophies and teaching methods affect perceived levels of self-esteem, self-efficacy, prosocial behavior and aggressive behavior in children. The study utilized the Washington Self-Description Questionnaire (WSDQ), three subscales of the Children’s Multi-dimensional Self-Efficacy Scales (i.e., academic achievement, self-regulated learning, & social), the Physical and Verbal Aggression Scale, and the Prosocial Behavior Scale. Findings suggested that there were no differences on perceived levels of self-

esteem, self-efficacy for academic achievement, self-efficacy for self regulated learning, social self-efficacy, or prosocial behavior. But, Montessori children reported significantly lower levels of physical/verbal aggression and a stronger perceived ability to make and keep friends of the same gender (Castellanos, 2003).

Sullivan (2007) compared characteristics of early elementary homework for Montessori and traditional schools. The study found that there were no significant differences in the amount of time children spent doing homework or the amount of parental involvement in homework, but Montessori children were permitted to choose topics of essays and other homework twice as often on average as children in traditional schools (Sullivan, 2007).

This investigator conducted a study of threats to the future of public Montessori elementary schools (Murray, 2005). Based on an online survey with 85 principals and other leaders in public Montessori elementary schools, the study outlined characteristics of Montessori education in public elementary schools as they began facing the new challenges of the No Child Left Behind Act of 2001 (NCLB). Despite the lack of emphasis on traditional testing practices in Montessori education, the study found that many schools have participated in standardized testing programs for many years and that support for testing practices does not differ between principals with and those without Montessori certification. Even though they struggle with budget cuts, stricter state and federal requirements, and teacher shortages, public Montessori elementary schools reported striving to maintain a unique educational

environment through certified teachers, ongoing professional support for teachers, and well equipped classrooms (Murray, 2005).

Finally, one unpublished dissertation dealt directly with the question of academic achievement in Montessori schools. Manner (2000) investigated math and reading learning growth over a three-year period in a public school district in Florida. Beginning in second grade, Montessori students were matched with students in a traditional elementary school of similar demographics. Starting from nearly equivalent performance on math and reading, the study found Montessori scores surpassing those of the traditionally educated students in both areas (Manner, 2000).

In addition to the recent unpublished dissertations on Montessori education, other studies have been published in mainstream journals in recent years regarding the effectiveness of Montessori education. A high profile study was recently published in the journal *Science* (Lillard, A. & Else-Quest, 2006). The study evaluated the impact of Montessori education on social and academic outcomes for children at the end of the two most widely available Montessori age groups: primary (three- to six-year-olds) and elementary (six- to twelve-year olds). The study experimental and control groups were established based on students selected through a lottery to attend a public Montessori school in Milwaukee, Wisconsin. The school served predominantly urban minority children, had been in operation for nine years, and was recognized by the AMI. Results showed superior outcomes for the children who attended the Montessori school. Montessori children in the younger age group

performed better on standardized tests of reading and math, engaged in more positive interaction on the playground, and showed more advanced social cognition and executive control. They also expressed more concern for fairness and justice. The older Montessori children wrote more creative essays with more complex sentence structures, selected more positive responses to social dilemmas, and reported feeling more of a sense of community at school (Lillard, A. & Else-Quest, 2006).

The AMI published results from a study conducted by Dohrmann (2003) on the long term impacts of two public Montessori elementary programs also in Milwaukee Public Schools. The study included a large number of subjects, 201, and a control group matched on gender, race/ethnicity, socioeconomic status, and high school attended. According to Angeline Lillard and Nicole Else-Quest (2006), results from this study were presented as a paper at the American Educational Research Association annual convention in San Francisco in 2006. Researchers gathered scores from the ACT, WKCE (Wisconsin Knowledge and Concepts Examination, a form of the nationally standardized Terra Nova), and high school GPA for Montessori and comparison group high school graduates from the Milwaukee Public Schools. Using structural equation modeling the study found the students who had attended the Montessori schools from the approximate ages of 3 to 11 significantly outperformed the control group on Math/Science scores on the ACT and WKCE in high school with no differences found on English/Social Studies scores or GPA (Dohrmann, 2003).

Montessori education was included as 1 of 29 comprehensive school reform programs evaluated in a meta-analysis conducted by Borman (2003). Although only two Montessori studies were included in the meta-analysis, the programs evaluated in the studies analyzed demonstrated one of the largest effects on achievement ($d = .27$) of all the programs evaluated (Borman, 2003).

Results of a 2005 study were more mixed, finding that Montessori students did not surpass students in other types of schools in a large urban district in western New York (Lopata, Wallace, & Finn, 2005). This study attempted to control for parental choice through comparing the Montessori school to two other magnet schools with similar selection criteria as well as one nonmagnet school. In addition, schools were matched on gender, ethnicity, and socioeconomic status, and individual child demographic characteristics were included as covariates. These results showed superior performance for fourth grade Montessori students in math but inferior performance of eighth grade students in the Montessori school compared to the other schools on language arts achievement (Lopata, Wallace, & Finn, 2005).

Two recent articles explored differences between traditional and Montessori middle schools in terms of motivation, quality of experience, time use, and perceptions of schools, teachers, and friends (Rathunde & Csikszentmihalyi, 2005a, Rathunde & Csikszentmihalyi, 2005b). Both articles presented results from studies with 290 demographically matched Montessori and traditional middle school students using surveys as well as the Experience Sampling Method (ESM). Montessori

students reported more positive perceptions of their school environments and teachers and more often perceived classmates as friends. They also reported greater affect, potency (feeling energetic), intrinsic motivation, flow experience, and undivided interest (combination of high intrinsic motivation and high salience or importance). While Montessori students spent more time in school on school related tasks, chores, collaborative work, and individual projects, traditional students spent more time at school engaged in social and leisure activities and in didactic educational settings (listening to lecture, note taking, watching instructional videos) (Rathunde & Csikszentmihalyi, 2005a, Rathunde & Csikszentmihalyi, 2005b).

Future of Montessori Education in the United States

Despite the number of Montessori schools in the U.S. and growing evidence of its effectiveness, several hurdles stand in the way of future growth of Montessori education. First, the Montessori name is not legally protected. So, any school could use the term in their name regardless of the degree to which they follow the principles of the Montessori philosophy (Wentworth, 1999). The AMS and the AMI have programs for recognizing schools that adhere to their requirements for authentic Montessori education (American Montessori Society, n.d.c; Association Montessori Internationale, n.d.a), but many schools operate without such recognition. Some of these schools may borrow only minor elements of the Montessori Method making it

difficult for parents to gauge the fundamental aspects of the approach (Lillard, A., 2005).

Second, the most highly regarded teacher training programs organized by the AMS and AMI are not easily accessible. AMS has 84 training centers across the United States, but they are highly concentrated with over half in the northeast and south (American Montessori Society, n.d.d). AMI has only 11 training centers in the entire country. (Association Montessori Internationale, n.d.b). Since alternative Montessori teacher training programs, including distance learning programs, have emerged with little quality control, authentic Montessori education has become increasingly difficult for laymen to recognize (Association Montessori Internationale, n.d.c)

Finally, public Montessori schools represent both opportunities and challenges to the future of Montessori education in the U.S. Montessori in public schools could contribute to increased access and recognition for the approach. Hainstock (1997, p. 43) suggested parents have pressured public schools to consider Montessori programs because of a desire for more choice and better quality in education. Angeline Lillard (2005, p. 4-5) reported widespread dissatisfaction with public schools cited across a number of studies and a need for an alternative approach as an answer to the “crisis in education.” However, the challenges of fitting into mainstream requirements may force public Montessori schools to modify elements that are fundamental to the method. In particular, high stakes testing may create

challenges for Montessori schools by forcing them to shift time away from Montessori lessons and self-directed work in order to prepare for tests (Anderson, 2005). Furthermore, state teaching credentials are more crucial in meeting federal requirements for highly qualified teachers in public schools than Montessori certification (Murray, 2005).

Not surprisingly, with so many opportunities for diluting the approach, the Montessori community believes that the general public lacks a clear understanding of the philosophy or method of Montessori education (Chattin-McNichols, 1998). In response, this study will contribute to the body of knowledge surrounding Montessori education by answering research questions regarding (1) How much does the general public know about Montessori education? (2) What are the general public's perceptions of Montessori education? and (3) What attitudes and demographic characteristics are associated with positive perceptions of Montessori education?

Chapter 3: Methods

In order to gauge public perceptions of Montessori education, an online survey was conducted with members of an internet panel administered by e-Rewards Market Research, a national research firm. The study answered research questions regarding how much the general public knows about Montessori education, perceptions of Montessori education and the attitudes and demographic characteristics that are associated with positive perceptions of Montessori education. Further details of the study participants, measures and procedures are outlined in the sections that follow.

Participants

Human subjects approval. Approval for this study was obtained from the human subjects committee (HSC-L) of the University of Kansas. No unusual or extreme hardship was experienced by participants in this study. Respondents were members of an online panel maintained by e-Rewards Market Research. The only demand on respondents was the time necessary to respond to the online survey regarding their perceptions of traditional and Montessori education. In exchange for participation in the study, respondents received the standard incentive e-Rewards offers its panelists for survey completion.

Sample. Specifically, data were collected through e-Rewards' weekly omnibus survey. Each week, e-Rewards administers an online survey comprised of questions on various topics submitted by their clients. The weekly surveys include a demographically representative sample of at least 1,500 U.S. adult panel members (e-Rewards Market Research, n.d.a). The sample is stratified based on 2000 U.S. Census data for age, ethnicity, gender, region, and income. For the week these questions were fielded, a total of 1,520 panel members responded. There were no incomplete surveys, so missing data were not an issue in this study. However, all analyses for this study other than awareness were based on the 1,025 respondents (67.4% of 1,520) who indicated that they had heard of Montessori education.

E-Rewards reported a 90% retention rate for panel members and response rates from 15 to 25% on each individual survey due to their commitment to their panelists. E-Rewards members are guaranteed strict adherence to a robust privacy policy and receive an incentive for responding to surveys (e-Rewards, n.d.c). Members earn points or "e-Rewards currency" for their participation in surveys. These points are accumulated and can be redeemed for various goods and services from firms such as: Air France KLM, American Airlines®, BLOCKBUSTER®, Borders®, Continental Airlines®, Delta Air Lines®, Hilton®, Northwest Airlines®, U.S.Airways®, Zales®, eBags® and other program partners (e-Rewards Market Research. n.d.b).

Demographics. A variety of demographic information was collected to describe study participants. The sampling design for the overall sample of 1,520 was stratified to reflect the 2000 U.S. Census on gender, age, region, ethnicity, and income. The sample demographic characteristics mirrored the Census data on these and other demographic characteristics fairly well. Even though one-sample t tests on the continuous variables and dichotomized transformations of the categorical variables showed significant differences between Census data and sample demographics, this result was not surprising considering the large sample size in the study. When evaluating the magnitude of the differences between the sample and Census data using Cohen's d as effect size estimates, all differences except education level were extremely small ranging from .08 to .18. These values were clearly below the commonly accepted level of .2 to be considered even a small effect (Cohen, 1992). Only the difference in the proportion of college graduates between the sample (39.9%) and the Census (25.0%) reached the level of a small effect with Cohen's d of .30. Details of the demographic characteristics of the sample and comparisons to Census data are provided in the paragraphs that follow.

The sample was almost evenly split between men and women (53.9% male, $n = 820$; 46.1% female, $n = 700$). The gender breakdown of the 2000 Census showed 48.3% male and 51.7% female (U.S. Census, n.d.a). Average age of the sample was 41.83 ($SD = 15.71$, $N = 1,520$). Mean age for adults in the 2000 Census was 44.15 ($SD = 16.30$) (U.S. Census, n.d.a). The regional representation for the sample and the

Census are provided in Table 3.1, and ethnic composition of the sample and the 2000 Census are provided in Table 3.2. Table 3.3 breaks down the household income of study participants compared to Census data.

Table 3.1

Regional Representation of Sample Compared to Census

Region	Sample ^a (N = 1,499)	2000 Census
Northeast Region	19.2%	19.4%
Midwest Region	18.1%	22.8%
South Region	38.2%	35.7%
West Region	24.5%	22.1%

Note. The data in column 2 are from Census 2000 Summary File 1 (SF 1) 100-Percent Data. Generated by Angela Murray using American FactFinder retrieved on February 17, 2008 from <http://factfinder.census.gov>.

^aOnly respondents residing in one of the 50 United States were categorized by region. Since 21 respondents were in the U.S. military overseas or resided in Puerto Rico, the Marshall Islands, or some other location, the sample for region is less than 1,520.

Table 3.2

Ethnic Composition of Sample Compared to Census

Ethnic group	Sample (N = 1,520)	2000 Census
Caucasian/White	65.5%	72.0%
Hispanic Origin	14.7%	11.0%
African American /Black/Caribbean American	12.6%	11.2%
Asian American/Pacific Islander	4.3%	3.7%
Native American, Inuit or Aleut	0.9%	0.7%
Other	1.9%	1.4%

Note. The data in column 2 are from Census 2000 Summary File 1 (SF 1) 100-Percent Data. Generated by Angela Murray using American FactFinder retrieved on February 17, 2008 from <http://factfinder.census.gov>.

Table 3.3

Household Income of Sample Compared to Census

Income category	Sample (N = 1,520)	2000 Census
Less than \$25,000	26.0%	28.7%
\$25,000 to \$49,999	28.2%	29.3%
\$50,000 to \$74,999	17.3%	19.5%
\$75,000 to \$99,999	12.6%	10.2%
\$100,000 to \$149,999	12.5%	7.7%
\$150,000 or more	3.4%	4.6%

Note. The data in column 2 are from Census 2000 Summary File 3 (SF 3) - Sample Data. Generated by Angela Murray using American FactFinder retrieved on March 6, 2008 from <http://factfinder.census.gov>.

As illustrated in Table 3.4, information gathered regarding participant education showed more variation than other demographic characteristics when compared to the 2000 Census. Education level was not one of the variables used to stratify the sample.

Table 3.4

Education Level of Sample Compared to Census

Education Level	Sample (N = 1,520)	2000 Census
High School Graduate	33.4%	47.0%
College Graduate	39.9%	25.0%
Graduate School	20.8%	7.7%
Other	6.0%	20.3%

Note. The data in column 2 are from Census 2000 Summary File 3 (SF 3) - Sample Data. Generated by Angela Murray using American FactFinder retrieved on March 6, 2008 from <http://factfinder.census.gov>.

Along with participant education, marital status was not one of the variables upon which the sampling scheme was based. Even so, Table 3.5 shows fairly consistent results for study participants compared to Census data on marital status. In terms of other family characteristics, 3 in 10 respondents (29.3%, $n = 445$) indicated that there were children under the age of 18 living in the home. The 2000 Census indicated 32.8% of U.S. householders had their own children under the age of 18 living with them (U.S. Census, n.d.c).

Table 3.5
Marital Status of Sample Compared to Census

Marital Status	Sample ($N = 1,520$)	2000 Census
Married	42.8%	51.7%
Single	36.9%	31.9%
Living with partner	8.4%	5.2%
Other	11.9%	11.2%

Note. The data in column 2 are from Census 2000 Summary File 3 (SF 3) - Sample Data. Generated by Angela Murray using American FactFinder retrieved on March 6, 2008 from <http://factfinder.census.gov>.

In addition to basic demographic characteristics, data were captured regarding experience with Montessori education. Only 80 participants ever had children enrolled in a Montessori school, with only 12 having children currently enrolled in a Montessori school. Of those whose children had ever attended a Montessori school, the majority (72.5%, $n = 58$) did not know if it was affiliated with a national

Montessori organization. The largest proportion reporting an affiliation mentioned American Montessori Society (AMS) (15.0%, $n = 12$), while another 8.8% ($n = 7$) mentioned Association Montessori Internationale (AMI). A small portion of participants indicated that their child's Montessori school was not affiliated with any national organization or that it was affiliated with a national organization other than AMS or AMI (2.5% , $n = 2$ and 3.8%, $n = 3$, respectively).

Most (82.5%, $n = 66$) of the Montessori schools attended were private schools, 12.5% ($n = 10$) were public, and 5% ($n = 4$) of the subsample had children who attended both public and private Montessori schools. Participants also indicated the age ranges of their children when they attended Montessori schools. The mean youngest age of children attending Montessori schools was 3.49 years ($SD = 1.60$, $n = 80$). The mean oldest age of children attending Montessori schools was 5.76 years ($SD = 2.54$, $n = 80$).

The study also attempted to gauge respondents' potential exposure to Montessori education through living in areas with a high prevalence of public Montessori schools. The determination of whether or not a particular respondent lived in an area with a high likelihood of public Montessori schools was based on self-reported presence of magnet and/or charter schools in the local district and state of residence. The Jola Montessori database (Jola Montessori, n.d.) identified 38 states with public Montessori schools. So, individuals living in 1 of these 38 states who also reported living in a district with magnet and/or charter schools were identified as

living in an area with a high likelihood of public Montessori schools. The results showed 45.6% of respondents ($n = 632$) lived in an area with a high likelihood of public Montessori schools, and 54.4% ($n = 632$) did not live in an area with a high likelihood of public Montessori schools.

Measures

The quality of the panel participants and the sample's representativeness of the U.S. population contribute to this study's validity for the purpose of analyzing the general public's perceptions of Montessori education. Beyond external validity, steps were taken to provide content validity evidence as well. A Table of Specifications is provided in Appendix A that identifies specific sources for each item included in the instrument. The instrument was reviewed by two members of the research committee of the American Montessori Society. The instrument was also reviewed by six Montessori teachers, including a combination of primary and elementary teachers with AMS and AMI certifications, to identify any disagreements on the correct answers for the Montessori knowledge questions. In addition, it was reviewed by the director of marketing research from a major U.S. service firm and by a vice president of a national marketing research firm with a PhD who also teaches marketing research at Georgia Institute of Technology. Finally, the instrument was field tested with six individuals, including parents and nonparents both with and without

Montessori experience to identify any potential points of confusion on the questionnaire.

The questionnaire covered: awareness of Montessori education, knowledge level of basic characteristics of Montessori education, perceptions of Montessori education, attitudes toward education in America in general, and demographics. The questionnaire (including skip patterns and directions) is provided in Appendix B. Composition of the measures representing Montessori knowledge, Montessori perceptions, and general education attitudes regarding the role and performance of schools in America are detailed in the sections that follow.

Knowledge level of Montessori education. The largest portion of the questionnaire was devoted to gauging respondents' actual knowledge level of basic characteristics of Montessori education in the areas of Montessori school structure, Montessori teachers, Montessori students, Montessori classrooms and goals of Montessori education. A total of 45 items in these categories were presented with response options of true or false. A Table of Specifications in Appendix A lists each of the items along with correct responses and citations of the sources from which they were drawn.

A total score was calculated to represent each respondent's knowledge of Montessori education. A higher score represented a larger number of correct responses and a higher level of knowledge regarding Montessori education. Initially, the scale included all 45 items from the knowledge questions. However, eight items

were eliminated from the scale due negative item-total correlations. A ninth item was eliminated due to an extremely low item-total correlation of .05. The final Montessori knowledge composite score included 36 items with possible scores ranging from 0 to 36. The actual distribution of scores ranged from a low of 8 to a perfect score of 36. Internal consistency using Cronbach's alpha was .78 for the 36-item Montessori knowledge composite. The mean score on the composite of 36 items was 25.59, or 71% correct ($SD = 4.61$, $N = 1,025$).

Perceptions of Montessori education. In order to measure attitudes toward Montessori education, respondents rated their level of agreement or disagreement on a series of 18 statements using a five-point Likert scale (1 = *strongly disagree*; 3 = *neutral*; 5 = *strongly agree*). The Table of Specifications in Appendix A lists the components of the Montessori support composite and provides sources which mention each of the statements as one of the goals of Montessori education.

A composite "Montessori support" measure was calculated for each respondent based on responses to the 18 Montessori effectiveness questions. The composite scores ranged between 18 for the weakest support to 90 for the strongest support. The mean rating across all 18 items was 3.80 on the five-point scale which would be interpreted that respondents tended to *agree* with these statements regarding Montessori education ($SD = .74$, $N = 1,025$). An exploratory factor analysis was conducted on the 18 items comprising the Montessori support composite scale to determine if multiple constructs were represented by the items. One factor was

extracted; therefore, one composite score was used to represent the construct of Montessori support. Detailed results from the exploratory factor analysis are provided in Appendix C. Cronbach's alpha for the Montessori support composite was very high at .98.

Attitudes toward the performance of schools in America in general. To understand the relationship between perceptions of education in general and perceptions of Montessori education, information was also gathered regarding attitudes toward the performance of schools in America. The same 18 items which were used to rate the perceived performance of Montessori education were also used to gauge perceptions of the performance of education in America overall. These items are listed in the Table of Specifications in Appendix A. A composite score was calculated based on the 18 questions using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with a midpoint of 3 (*neutral*). An exploratory factor analysis was conducted to determine if the 18 items could be used to create one single composite score for support of schools in America, or if multiple dimensions of school support were present. The results of the factor analysis showed a one factor solution supporting the use of a single composite score. Details are provided in Appendix C. Scores for American educational performance ranged from a low of 18 for those who had the least favorable opinions of America's educational system to a high of 90 for those with the most positive perceptions of America's educational system. The mean rating across all 18 items for the perceived

performance of schools in America was 2.83 on the five-point scale which would be interpreted as *neutral* ($SD = .84, N = 1,025$). Cronbach's alpha for the scale was very high at .96.

Attitudes toward the role of education in America in general. To understand the relationship between attitudes toward education in general and perceptions of Montessori education, a composite for attitudes toward the desired role of education in America overall was calculated. The role of education questions employed a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with a midpoint of 3 (*neutral*). In order to eliminate the possibility that the Montessori questions would bias responses to the general educational attitude questions, general education attitude questions preceded the Montessori questions in the questionnaire. An exploratory factor analysis was conducted to determine that four items could be used to create one single composite for the desired role of schools beyond academics. These four questions gauged respondents' support of educational objectives that are associated with Montessori education outside the particular context of Montessori education, including cooperation, community, creativity, and intrinsic motivation. Details of the exploratory factor analysis are provided in Appendix C.

Scores on the composite for the perceived role of schools in America beyond academics ranged from the lowest possible of value of 4 to the highest possible value of 20. Higher scores represented greater belief in the importance of schools playing a role in children's development beyond academics. Cronbach's alpha for the four

items in the composite was strong at .88 ($N = 1,025$). The mean value across the four items comprising the composite was 4.23 on the five-point scale, suggesting a fairly strong degree of support for schools playing a role beyond academics ($SD = .89$, $N = 1,025$).

Procedures

The data for this study were collected using an online panel maintained by e-Rewards Market Research. Each week e-Rewards sends e-mail invitations to its panelists to obtain a demographically stratified sample of at least 1,500 respondents for its omnibus survey. The weekly e-Rewards omnibus survey contains a maximum of 40 client-submitted questions in addition to 7 standard demographic questions. Thus, the firm estimates that panelists selected to participate each week's omnibus survey should spend no more than 15 minutes completing the online self-administered questionnaire (e-Rewards Market Research, n.d.a). E-Rewards identified relatively low client demand for their omnibus study scheduled for December 7, 2007, so this was the opportunity when this study's questions were fielded.

E-Rewards is a well respected firm in the marketing research community. It has been in business since 1999 and uses an e-mail and direct mail, invitation-only process of recruiting individuals to participate in their online panel. Currently, the panel consists of 2.6 million members. The firm maintains the quality of their panel

membership through fraud prevention strategies which monitor for inconsistent profile responses, straight-line survey responses, responses that are submitted too quickly and duplicate memberships. The firm also manages participation levels to ensure that no members participate in more than four surveys each year. Furthermore, panelist activity is monitored to ensure that nonresponsive members are phased out, and panelist identity is verified through matching physical addresses against government postal information (e-Rewards Market Research, n.d.b).

After the data were collected, e-Rewards provided an electronic file of survey responses to the investigator in SPSS format via e-mail. No hard copy survey results were provided to the investigator. Data provided to the investigator by e-Rewards contained only raw data from the survey responses and no personally identifiable or sensitive information. If a participant decided to withdraw from the study, the investigator would have manually dropped them from the database received from e-Rewards (B. Hagins, personal communication, October 1, 2007).

Chapter 4: Results

The objective of this study was to answer three research questions: (1) How much does the general public know about Montessori education? (2) What are the general public's perceptions of Montessori education? and (3) What attitudes and demographic characteristics are associated with positive perceptions of Montessori education? Details of the results are provided in the sections that follow.

Knowledge of Montessori Education

Awareness of Montessori education. Awareness of Montessori education was gauged by asking if the respondent had “ever heard the term Montessori education.” Of the 1,520 e-Rewards members who participated in the online survey, a total of 67% of respondents reported having heard of Montessori education ($n = 1,025$), while 33% did not say they had heard of it ($n = 495$). Significant demographic differences were evident in age, income, and education level between those who were and were not aware of Montessori education. An independent-samples t test indicated that individuals who were not aware of Montessori education were significantly younger ($M = 36.58$, $SD = 13.82$) than those who had heard of it ($M = 44.37$, $SD = 15.94$), $t(1518) = 9.319$, $p < .001$, $d = .52$. Another independent-samples t test found that those who had heard of Montessori education had higher mean income ($M = \$65,827$,

$SD = \$65,827$) than those who had not ($M = \$51,540$, $SD = \$48,808$),

$t(1518) = 4.831$, $p < .001$, $d = .28$.

In terms of the categorical demographic variables, only education level differed meaningfully when comparing participants who were aware of Montessori education and those who were not. Table 4.1 outlines the differences in education level between the two groups. A test of proportions showed that those who had heard of Montessori education had significantly higher levels of education (42.6% college graduates and 25.2% graduate school) than those who had not (34.1% college graduates and 11.7% graduate school), $\chi^2(3, N = 1,520) = 77.94$, $p < .001$, $\Phi = .23$. However, using a test of proportions there were no significant differences between those who were aware of Montessori education and those who were not in terms of gender (52.5% male compared to 57.0% male, $\chi^2(1, N = 1,520) = 2.70$, $p = .10$). Table 4.2 outlines the differences in ethnic composition comparing the group who was aware of Montessori education to the group that was not. Using a test of proportions, the differences were statistically significant, but the effect size was small, $\chi^2(5, N = 1,520) = 21.16$, $p = .001$, $\Phi = .12$. Table 4.3 provides a breakdown of the comparison of region of residence between participants who had heard of Montessori education and those who had not. These differences were not statistically significant, $\chi^2(3, N = 1,520) = .644$, $p = .886$.

Table 4.1

Comparison of Education Level of Those Aware and Unaware of Montessori Education

Education level	Aware (N = 1,025)	Unaware (N = 495)
High School Graduate	26.7%	47.1%
College Graduate	42.6%	34.1%
Graduate School	25.2%	11.7%
Other	5.5%	7.1%

Table 4.2

Comparison of Ethnic Composition of Those Aware and Unaware of Montessori Education

Ethnic group	Aware (N = 1,025)	Unaware (N = 495)
Caucasian/White	67.2%	62.0%
Hispanic Origin	14.5%	15.2%
African American /Black/Caribbean American	12.6%	12.7%
Asian American/Pacific Islander	3.1%	6.9%
Native American, Inuit or Aleut	.4%	1.8%
Other	2.1%	1.4%

Table 4.3

Comparison of Region of Residence of Those Aware and Unaware of Montessori Education

Region	Aware (N = 1008) ^a	Unaware (N = 491) ^a
Northeast Region	19.1%	19.3%
Midwest Region	17.7%	18.9%
South Region	38.2%	38.3%
West Region	25.0%	23.4%

^aOnly respondents residing in one of the 50 United States were categorized by region. Since 21 respondents were in the U.S. military overseas or resided in Puerto Rico, the Marshall Islands, or some other location, the sample for region is less than 1,025 for the Aware group and less than 495 for the Unaware group.

Participants were required to report having at least heard the term “Montessori education” in order to respond to the subsequent questions regarding Montessori education, resulting in a sample of 1,025 for the remaining analyses. Thus, the second aspect of Montessori awareness captured how much respondents who said they had at least heard of Montessori education perceived knowing about it using a five-point Likert scale ranging from 1 (*not at all knowledgeable*) to 5 (*very knowledgeable*) with a midpoint of 3 (*somewhat knowledgeable*). Of those who had heard of Montessori education, the mean level of knowledge reported was 2.39 ($SD = 1.09$, $N = 1,025$). Table 4.4 shows that only 4.6% believed themselves to be *very knowledgeable* while five times as many, 25%, reported themselves to be *not at all knowledgeable*.

Table 4.4

Self-reported Knowledge of Montessori Education (N = 1,025)

Self-reported knowledge level	Frequency	Percent
1=Not at all knowledgeable	256	25.0%
2	296	28.9%
3 = Somewhat knowledgeable	339	33.1%
4	87	8.5%
5 = Very knowledgeable	47	4.6%

Knowledge of Montessori education. Table 4.5 outlines the individual item results for all the Montessori knowledge items as well as the correct responses. Correct responses ranged from a low of 6.1% to a high of 96.5%. The mean score on the composite score of 36 of the 45 items was 25.59 ($SD = 4.61$, $N = 1,025$) or 71.1%

($SD = 12.8\%$). The largest portion of respondents (96.5%) knew that Montessori classrooms have hands-on materials for learning and that goals of Montessori education include helping children reach their individual potential (95.6%) and motivating children to want to learn (96.3%). Very few respondents knew that Montessori classrooms do not typically have areas for pretend play for preschoolers (16.4%) or multiple sets of each activity so that children do not have to wait for a turn (16.2%). In addition, few knew that Montessori teachers do not primarily motivate children by praising good work (6.1%) or change activities frequently during the day to keep children interested (12.5%).

Table 4.5

Montessori Knowledge Individual Item Correct Responses and Results (N = 1,025)

Montessori education is...	Correct response	% Correct
1. available in public schools.	True	20.8
2. always affiliated with a particular religion.	False	86.0
3. only for preschoolers.	False	81.2
<i>Montessori teachers most often...</i>		
4. evaluate children's learning by giving students tests based on the curriculum.	False	52.9
5. evaluate children's learning by observing children's work.	True	93.3
6. view learning as developing from within the child based on his/her experience.	True	90.3
7. see their role as transferring knowledge to children.	False	21.2
8. see their role as making learning seem like play ^a .	False	28.6
9. motivate children through following the children's interests.	True	88.7
10. motivate children by praising good work ^a .	False	6.1
11. change activities frequently during the day to keep children interested ^a .	False	12.5
12. schedule breaks for the class during work time to rest ^a .	False	22.2
13. teach lessons for the entire class so everyone gets the information at the same time.	False	61.4
14. are more concerned with children's understanding concepts than correct answers.	True	87.3
15. keep detailed records on individual student's progress in the curriculum ^a .	True	81.0
<i>Children in Montessori classes most often...</i>		
16. decide what they want to work on each day.	True	60.0
17. work at their own pace.	True	91.4
18. are expected to sit quietly while doing their work.	False	63.1
19. receive certificates, stickers or other forms of recognition for encouragement.	False	22.1
20. get small prizes or rewards for good behavior.	False	37.0
21. are allowed to work together in small groups.	True	92.8
22. have a large block of time to work without interruptions ^a .	True	75.6
23. are expected to do their own work without help from classmates.	False	71.3

^aNot included in Montessori support composite.

Table 4.5 (Continued)

Montessori Knowledge Individual Item Correct Responses and Results (N = 1,025)

Montessori classrooms <i>most often</i> ...	Correct response	% Correct
24. have activities for preschoolers for educating the senses.	True	94.1
25. have multiple sets for each activity so that children do not have to wait for a turn ^a .	False	16.2
26. have specialized workbooks.	False	26.5
27. have hands-on materials for learning.	True	96.5
28. have incentive charts on the wall recognizing children for good work.	False	39.1
29. have areas for pretend play for preschoolers.	False	16.4
30. display papers with the highest grades on the bulletin board in elementary classes to showcase the best work.	False	74.9
31. include children of mixed ages.	True	79.3
<i>Primary goals of Montessori education include...</i>		
32. helping children develop the ability to concentrate.	True	90.1
33. teaching children to be respectful of others.	True	93.8
34. teaching children to value high grades.	False	60.8
35. helping children to reach their individual potential.	True	95.9
36. keeping children on track with classmates at their grade level.	False	49.2
37. developing children's self-discipline.	True	89.7
38. developing children's sense of community at school.	True	89.6
39. helping children gain a competitive edge in life.	False	33.3
40. motivating children to want to learn.	True	96.3
41. providing an orderly learning environment ^a .	True	73.4
42. helping children become independent people.	True	93.0
43. helping children become responsible people.	True	92.2
44. teaching children to cooperate with one another.	True	93.0
45. teaching children to rely on the teacher's feedback to know how they are doing on their work.	False	51.4

^aNot included in Montessori support composite.

Perceptions of Montessori Education

Table 4.6 outlines the individual item results for all the questions comprising the Montessori support composite. Montessori education was viewed as being particularly strong in encouraging creative thinking ($M = 4.00$, $SD = .87$), but less effective in meeting the needs of children with special needs ($M = 3.47$, $SD = .93$) or developing children's math skills ($M = 3.64$, $SD = .89$).

Table 4.6

Montessori Support Item Means (N = 1,025)

Montessori schools do a good job...	Mean	SD
1. helping children learn to cooperate with one another.	3.83	.84
2. challenging children to expand their intellectual abilities.	3.90	.87
3. meeting the needs of highly intelligent children.	3.84	.95
4. meeting the needs of children with special needs.	3.47	.93
5. developing children's problem solving skills.	3.86	.86
6. developing children's math skills.	3.64	.89
7. developing children's reading skills.	3.77	.84
8. developing children's writing skills.	3.72	.86
9. helping children learn to be independent people.	3.87	.86
10. helping children learn to be responsible people.	3.79	.86
11. helping children develop the ability to concentrate.	3.72	.88
12. teaching children to be respectful to others.	3.84	.85
13. helping children to reach their individual potential.	3.91	.87
14. developing children's self-discipline.	3.73	.90
15. developing children's sense of community at school.	3.78	.85
16. encouraging creative thinking.	4.00	.87
17. motivating children to want to learn.	3.91	.85
18. helping children learn <i>how</i> to learn.	3.87	.89

Note. 1 = *Strongly Disagree*; 3 = *Neutral*; 5 = *Strongly Agree*.

In order to determine if perceptions of Montessori education were generally positive or negative, the Montessori support composite was tested using a single-sample t test. The null hypothesis was that average perceptions of Montessori education were neutral. Neutral perceptions would result in a test value for the composite of 54 based on a neutral response of 3 on each of the 18 perception items. The mean score on the composite was 68.46 ($SD = 13.27$) which was significantly above neutral, $t(1024) = 34.90, p < .001$. In fact, Cohen's d of 1.09 indicates a very large effect size supporting the conclusion that participants perceived Montessori education to do a good job in these areas, and the significance level detected was not simply the result of the very large sample size (Cohen, 1992).

Scores for perceptions of the performance of schools in America in general provided another basis for interpreting perceptions of the effectiveness of Montessori education. Thus, a paired-samples t test was conducted to determine if the mean score for Montessori support, 68.46 ($SD = 13.27$) was significantly different than the mean score for perceptions of the performance of schools in America in general, 51.01 ($SD = 15.16$). The results showed that the general public perceived Montessori education to do a significantly better job on these 18 attributes compared to schools in America in general, $t(1024) = 28.95, p < .001$. To obtain an effect size estimate, Cohen's d was calculated to be .90 which would be considered a large effect (Cohen, 1992).

In addition to examining perceptions of the effectiveness of Montessori education, the survey contained questions to gauge level of agreement with other aspects of Montessori education. The statements were based on commonly reported benefits and criticisms of Montessori education. Table 4.7 outlines the individual questions. Specific sources for each of the statements are listed in the Table of Specifications in Appendix A. The strongest agreement was found for the statements that Montessori education encourages children's curiosity ($M = 4.02$, $SD = .89$), challenges children to expand their intellectual abilities ($M = 3.97$, $SD = .88$), and motivates children to want to learn ($M = 3.96$, $SD = .86$). Higher levels of disagreement was evident for statements that Montessori education is too structured in classroom activities ($M = 2.19$, $SD = .96$) or focuses too much on academics for young children ($M = 2.33$, $SD = .94$).

Table 4.7

Level of Agreement with Statements Regarding Montessori Education (N = 1,025)

Montessori education...	Mean	SD
1. allows children too much freedom to choose their own work	2.67	1.05
2. is too structured in classroom activities	2.19	.96
3. motivates children to want to learn	3.96	.86
4. focuses too much on academics for young children	2.33	.94
5. is out of step with current educational practice	2.61	1.05
6. encourages children's curiosity	4.02	.89
7. challenges children to expand their intellectual abilities	3.97	.88

Note. 1 = *Strongly Disagree*; 3 = *Neutral*; 5 = *Strongly Agree*.

Relationship of Attitudes and Demographics to Support of Montessori Education

The third research question, “What attitudes and demographic characteristics are most associated with positive perceptions of Montessori education?” required multiple regression analyses. In order to determine what general attitudes toward education and demographic characteristics were associated with positive perceptions of Montessori education, the Montessori support composite variable served as the dependent variable in two separate multiple regression analyses.

The first multiple regression model evaluated the relationship between attitudes toward education in general and Montessori support, over and above demographic characteristics. The Montessori support composite score served as the dependent variable. Independent variables were entered into the model in blocks with the demographic characteristics of respondent gender, age, income, education, and presence of children in the home entered first. Demographic variables were included in the model in order to reduce the potential impact of unknown relationships between demographic characteristics and other predictor variables.

The second block included the composite score for support of the role of schools beyond academics and the composite score for perceptions of American school performance. Since Montessori education emphasizes development of the whole child rather than focusing on academic achievement (Lillard, P., 1972), the researcher hypothesized that those who showed stronger support of the role of schools beyond academics would demonstrate higher levels of Montessori support after

taking demographic characteristics into account. Furthermore, based on reports of increased interest in Montessori education as an alternative for dissatisfied public school parents (Hainstock, 1997), the researcher hypothesized that those with a lower level of satisfaction with the performance of schools in America would have a higher level of support for Montessori education after controlling for demographic characteristics. Table 4.8 provides bivariate correlations for the dependent and independent variables.

Table 4.8

Bivariate Correlations for General Education Attitudes Regression Model (N = 1,025)

Variables	Child in home ^b				Role of schools beyond academics	
	Gender ^a	Income	Age	Education ^c	General school support	
Montessori support	-.12**	-.07*	.07*	.02	.08**	.21**
Gender ^a	—	.29**	.43**	.04	-.06*	-.08*
Child in home ^b	—	.13**	-.14**	-.07*	-.00	-.06*
Income	—	—	.25**	.17**	-.07*	-.02
Age	—	—	—	.14**	-.12**	-.01
Education ^c	—	—	—	—	.01	.06
General school support	—	—	—	—	—	.13**

^a0 = female, 1 = male. ^b0 = no children, 1 = children in home. ^c0 = less than college graduate, 1 = college graduate or graduate degree, ** $p < .01$.

The demographic characteristics entered into the model in the first block accounted for a significant amount of variability in Montessori support, $R^2 = .04$, $F(5, 1019) = 7.61$, $p < .001$. In particular, gender, income, and age were significant explanatory variables of Montessori support as shown in Table 4.9. Women demonstrated more positive feelings toward Montessori education as did older individuals and those with lower incomes. However, income explained less than 1% of the variability in Montessori support. The undetectable contribution to variance explained and lower level of significance combined with the large sample size suggest that income was not a strong contributor to the model.

The results of the second block in the analysis indicated that general attitudes toward education accounted for a significant amount of the variability in Montessori support over and above demographic characteristics, $R^2\Delta = .04$, $F\Delta(2, 1017) = 23.02$, $p < .001$. Specifically, the hypothesis that stronger support of the role of schools beyond academics would be positively related to Montessori support was substantiated ($\beta = .19$). Perceptions of schools in America in general was also significantly related to Montessori support but counter to the direction of the hypothesis ($\beta = .06$). More positive perceptions of the performance of schools in America were related to more positive support for Montessori education. However, like income in the first block, general school support shared less than 1% of the variability in Montessori support and was significant only at the .05 level with a substantial degree of power. These facts suggest that general school

support was not a strong contributor to the model explaining Montessori support. Table 4.9 provides details of the results.

Table 4.9

Regression Analysis of General Education Attitudes and Montessori Support (N = 1,025)

Independent variables	R^2	$R^2\Delta$	β	sr^2
Block 1	.04**	.04**		
<i>Demographics</i>				
Gender ^a			-.17**	.02
Children in home ^b			.00	.00
Income			-.07*	.00
Age			.15**	.02
Education ^c			.03	.00
Block 2	.08**	.04**		
<i>Demographics</i>				
Gender ^a			-.15**	.02
Children in home ^b			.02	.00
Income			-.07*	.00
Age			.16**	.02
Education ^c			.03	.00
<i>General education attitudes</i>				
General school support			.06*	.00
Role of schools beyond academics			.19**	.03

^a0 = female, 1 = male. ^b0 = no children, 1 = children in home. ^c0 = less than college graduate, 1 = college graduate or graduate degree.

* $p < .05$, ** $p < .01$.

The second multiple regression model evaluated the relationship between Montessori exposure measures and Montessori support, beyond the impact of demographic characteristics. The Montessori support composite score once again served as the dependent variable. Independent variables were again entered into the model in blocks with the demographic characteristics of respondent gender, age, income,

education, and presence of children in the home entered first to control for unknown relationships between demographics and the independent variables. The second block included measures representing the degree to which participants had been exposed to Montessori education, including having a child who had attended a Montessori school, living in an area likely to have public Montessori schools (presence of magnet and/or charter schools in a state known to have public Montessori schools), and knowing more about Montessori education.

The researcher hypothesized that those who had more exposure to Montessori education would demonstrate higher levels of Montessori support. Specifically, the hypothesis was that participants who had a child enrolled in a Montessori school would demonstrate higher levels of Montessori support. Likewise, those living in areas more likely to have public Montessori schools were expected to show greater support for Montessori education. Finally, the researcher hypothesized that those who were more knowledgeable about or believed themselves to be more knowledgeable about Montessori education would be more supportive. Bivariate correlations for the components of the Montessori exposure regression model are provided in Table 4.10.

Table 4.10

Bivariate Correlations for Montessori Exposure Regression Model (N = 1,025)

Variables	Gender ^a	Child in home ^b	Income	Age	Education ^c	Montessori in area ^d	Child in Montessori ^e	Score ^f	Self-report knowledge
Montessori support	-.12**	-.01	-.07*	.07*	.01	.07*	.11**	.23**	.28**
Gender ^a	—	-.14**	.29**	.43**	.04	-.01	.02	-.09**	-.15**
Child in home ^b	—	—	.13**	-.14**	-.04	.01	.13**	-.07*	.07*
Income	—	—	—	.25**	.25**	.07*	.10**	.02	.04
Age	—	—	—	—	.03	.11**	.09**	.08*	-.07*
Education ^c	—	—	—	—	—	.06	.05	.19**	.14**
Montessori in area ^d	—	—	—	—	—	—	.01	.04	.15**
Child in Montessori ^e	—	—	—	—	—	—	—	.06	.35**
Score ^f	—	—	—	—	—	—	—	—	.29**

^a0 = female, 1 = male. ^b0 = no children, 1 = children in home. ^c0 = less than college graduate, 1 = college graduate or graduate degree. ^d0 = not live in area with public Montessori likely, 1 = live in area with public Montessori likely. ^e0 = had no children in Montessori, 1 = had children in Montessori; ^fMontessori knowledge score.

* $p < .05$, ** $p < .01$.

Results for the demographic characteristics entered into the model in the first block were consistent with the findings from the previous model. The results of the second block in the analysis indicated that measures of Montessori exposure accounted for a significant amount of the variability in Montessori support over and above demographic characteristics, $R^2\Delta = .09$, $F\Delta (4, 1015) = 27.19$, $p < .001$. Specifically, those who were more knowledgeable about ($\beta = .16$) or believed themselves to be more knowledgeable ($\beta = .23$) about Montessori education were significantly more supportive of Montessori education. However, living in an area likely to have public Montessori schools or having a child who had attended a Montessori school did not relate to support of Montessori education after taking into account actual and self-reported Montessori knowledge and demographics. Table 4.11 provides details of the second regression analysis.

Table 4.11

Regression Analysis of Montessori Exposure and Montessori Support (N = 1,025)

Independent variables	R^2	$R^2\Delta$	β	sr^2
Block 1	.04**	.04**		
<i>Demographics</i>				
Gender ^a			-.17**	.02
Children in home ^b			.00	.00
Income			-.07*	.00
Age			.15**	.02
Education ^c			.03	.00
Block 2	.13**	.09**		
<i>Demographics</i>				
Gender ^a			-.11**	.01
Children in home ^b			.00	.00
Income			-.09*	.01
Age			.13**	.01
Education ^c			-.03	.00
<i>Montessori exposure</i>				
Live in area likely to have public Montessori schools			.02	.00
Have had child in Montessori school			.02	.00
Knowledge score			.16**	.02
Self-reported knowledge			.23**	.04

^a0 = female, 1 = male. ^b0 = no children, 1 = children in home. ^c0 = less than college graduate, 1 = college graduate or graduate degree. ^d0 = not live in area with public Montessori likely, 1 = live in area with public Montessori likely. ^e0 = had no children in Montessori, 1 = had children in Montessori. * $p < .05$, ** $p < .01$.

Considering the results of these two regression analyses, it was possible to build a post hoc model that accounted for 16% of the variability in Montessori support by including support for the role of schools beyond academics, actual and self-reported Montessori knowledge and controlling for demographic characteristics, $F(8, 1016) = 24.93, p < .001$. Once again, individuals supporting the role of schools

beyond academics ($\beta = .19$), those who were more knowledgeable about ($\beta = .13$) or believed themselves to be more knowledgeable about ($\beta = .25$) Montessori education were significantly more supportive of Montessori education. Results of this combined model are outlined in Table 4.12.

Table 4.12

Regression Analysis of Combined Montessori Support Model

Independent variables	R^2	$R^2\Delta$	β	sr^2
Block 1	.04**	.04**		
<i>Demographics</i>				
Gender ^a			-.17**	.02
Children in home ^b			.00	.00
Income			-.07*	.00
Age			.15**	.02
Education ^c			.03	.00
Block 2	.16**	.13**		
<i>Demographics</i>				
Gender ^a			-0.09*	0.01
Children in home ^b			0.02	0.00
Income			-0.09*	0.01
Age			0.14**	0.02
Education ^c			-0.03	0.00
<i>Role of schools and Montessori knowledge</i>				
Role of schools beyond academics			0.19**	0.04
Knowledge score			0.13**	0.02
Self-reported knowledge			0.25**	0.05

^a0 = female, 1 = male. ^b0 = no children, 1 = children in home. ^c0 = less than college graduate, 1 = college graduate or graduate degree.

* $p < .05$, ** $p < .01$.

Chapter 5: Discussion

This study provides insight into the American public's perceptions of Montessori education one hundred years after its inception. Specifically, this study answers research questions regarding (1) How much does the general public know about Montessori education? (2) What are the general public's perceptions of Montessori education? and (3) What attitudes and demographic characteristics are associated with positive perceptions of Montessori education?

The results of this study support the assertion of Montessorians that people may recognize the Montessori name but have a limited understanding of specifics of the Montessori approach to education (Chattin-McNichols, 1998). While two thirds of respondents had heard of Montessori education, their average score on a series of Montessori knowledge questions was only 71% correct. In addition, people tended to rate their own knowledge of Montessori education as fairly limited.

Most respondents recognized aspects of Montessori education that are consistent with mainstream educational practice. In particular, the vast majority of respondents correctly indicated that Montessori environments have hands-on materials for learning (Lillard, A., 2005; Rambusch & Stoops, 1992) and that goals of Montessori education include helping children reach their individual potential (Lillard, P., 1972; Rambusch & Stoops, 1992) and motivating them to want to learn (Lillard, A., 2005; Seldin, 1999). These results were not surprising because

motivating children and helping them to reach their individual potential would be laudable goals for any educational environment, and manipulatives are commonplace in many classrooms today (Chattin-McNichols, 1998).

Fewer participants understood less intuitive aspects of Montessori education. For example, less than 10% understood Montessori educators' avoidance of extrinsic rewards in order to develop children's internal motivation. More than nine in ten participants mistakenly believed that Montessori teachers primarily motivate children by praising good work, and only one in four respondents correctly answered that Montessori children do not typically receive small tokens of recognition as encouragement (Lillard, A., 2005; Rambusch & Stoops, 1992). This misunderstanding is important because Montessori philosophy is based on the idea that students develop intrinsic motivation only when the learning activity itself, not an external incentive, is its own reward (Rambusch & Stoops, 1992).

Also misunderstood is the fact that Montessori classrooms do not typically have areas for pretend play for preschoolers (Chattin-McNichols, 1998) or multiple sets of each activity so that children do not have to wait for a turn (Hainstock, 1997; Lillard, P., 1972). These characteristics of Montessori classrooms are very different from typical school settings but have bases in Montessori philosophy. First, housekeeping or dress-up areas are not available in typical Montessori classrooms because Maria Montessori believed young children have a strong desire to understand the real world and engage in meaningful work, not artificial imitations of adult activities (Lillard, A., 2005). Second, the presence of only a single specimen of each

of the Montessori materials in the classroom is purposeful, reinforcing in children the habit of respecting the work of others and waiting one's turn (Hainstock, 1997).

The importance of the classroom community was a better understood aspect of the Montessori environment. In fact, nine in ten participants recognized that Montessori children are allowed to work together in small groups and that primary goals of Montessori education include teaching children to cooperate with one another and developing children's sense of community at school (Lillard, P., 1972).

Understanding of the role of the Montessori teacher as an indirect guide and preparer of the environment was mixed (Lillard, P., 1972). Even though nine in ten respondents recognized that development of children's concentration abilities is one of the primary goals of Montessori education, almost 90% of participants incorrectly believed that Montessori teachers change activities frequently during the day to keep children interested (Chattin-McNichols, 1998; Lillard, P., 1972). Furthermore, Montessori teachers' belief in the importance and energizing nature of meaningful work was clearly misunderstood with three in four respondents mistakenly believing that Montessori teachers schedule breaks for the class during work time to rest or that Montessori teachers see their role as making learning seem like play (Lillard, P., 1972). These findings suggest that people do not understand that Montessori teachers allow children to dictate their own schedules during long stretches of uninterrupted time so that they can engage in meaningful, self-chosen work until their interest is satisfied (Lillard, P., 1972).

Understanding of the philosophy upon which Montessori teachers base their classroom practices was limited. While over 90% of respondents recognized that Montessori teachers view learning as developing from within the child based on his/her experience (Lillard, P., 1996), almost 8 in 10 also erroneously believed that Montessori teachers see their role as transferring knowledge to children (Lillard, P., 1972; Lillard, A., 2005; Rambusch & Stoops, 1992). These conflicting views highlight misunderstanding of the importance Montessorians' place on development unfolding from within the child with a teacher's subtle guidance rather than his/her direct instruction (Lillard, P., 1972, p. 51).

Some aspects of the Montessori emphasis on individualized learning were fairly well understood. The majority of respondents recognized that Montessori children decide what they want to work on each day and work at their own pace (Lillard, P., 1972; Lillard, A., 2005; Rambusch & Stoops, 1992). More than 80% of respondents realized that Montessori teachers keep detailed records on individual student's progress through the curriculum (Lillard, P., 1996), evaluate children's learning by observing their work (Lillard, A., 2005), and are more concerned with children's understanding of concepts than correct answers (Lillard, P., 1972). And, fully 93% of respondents recognized that helping children learn to become independent people was one of the primary goals of Montessori education (Lillard, P., 1972; Lillard, A., 2005; Rambusch & Stoops, 1992). Even so, people did not understand the degree to which individualized learning made Montessori teachers' practices so different from other teachers. About half of participants erroneously

believed that Montessori teachers most often evaluate children's learning by giving tests based on the curriculum, and 4 in 10 mistakenly indicated that Montessori teachers present lessons for the entire class so everyone gets the information at the same time (Lillard, A., 2005; Lillard, A. & Else-Quest, 2006; Rambusch & Stoops 1992).

While roughly 9 in 10 respondents correctly identified most of the primary goals of Montessori education listed, the group was split in their ability to identify goals which are not associated with Montessori education. Half of participants were able to recognize that Montessori goals do not include keeping children on track with classmates at their grade level or teaching children to rely on the teacher's feedback to know how they are doing on their work. These participants seemed to grasp Montessori education's emphasis on individualized pacing and self-assessment. While two thirds of respondents erroneously believed that Montessori goals include helping children gain a competitive edge in life, the same number recognized that teaching children to value high grades is not a Montessori goal. These results suggest that people may understand the lack of emphasis on traditional grading in Montessori education, but confusion exists regarding the degree to which Montessori education downplays competition.

In spite of limited knowledge of some of the details of the approach, overall perceptions of Montessori education were fairly favorable. Results showed perceptions of Montessori education to be positive and significantly higher than perceptions of schools in America in general. Montessori education was seen as doing

a particularly good job in encouraging creative thinking but less so in developing children's math skills. While few studies have examined Montessori education and creativity, Angeline Lillard and Nicole Else-Quest (2006) supported the public's perceptions when they found that older Montessori students wrote more creative essays with more complex sentence structures than children who were not selected to attend a Montessori school through a lottery process. Contrary to popular opinion, however, four Montessori research studies demonstrated consistently superior math skills for Montessori children compared to children in other educational settings (Dohrmann, 2003; Lillard, A. & Else-Quest, 2006; Lopata, Wallace, & Finn, 2005; Manner, 2000). Finally, the general public perceived motivating children to want to learn and challenging children to expand their intellectual abilities as some of the strongest aspects of Montessori education. Research with Montessori middle school students conducted by Rathunde and Csikszentmihalyi (2005a, 2005b) supported these perceptions. The studies found that Montessori students reported greater intrinsic motivation, higher salience or importance of activities and more time spent on school-related tasks, chores, collaborative work, and individual projects while in school compared to traditional students who spent more time engaged in leisure activities and didactic educational settings while at school (Rathunde & Csikszentmihalyi, 2005a; Rathunde & Csikszentmihalyi, 2005b).

In addition, criticisms of Montessori education often cited in the literature were not commonly reported in this sample of the general public (Chattin-McNichols, 1998). Most respondents recognized that all Montessori schools are not affiliated with

a particular religion, and a relatively small proportion thought that Montessori education is out of step with current educational practice. While Montessorians cite conflicting criticisms that Montessori education is either too free or too structured, this study did not find widespread belief in either extreme (Chattin-McNichols, 1998). Less than 20% of respondents agreed either strongly or somewhat strongly that Montessori education allows children too much freedom to choose their own work. In fact, three fourths of respondents recognized that providing an orderly learning environment is a primary goal of Montessori education (Lillard, P., 1972, Lillard, A., 2005). Less than 10% agreed that Montessori education is too structured in classroom activities or focuses too much on academics for young children. Rather than believing the rigidity and academic focus of Montessori education robs children of creativity, as mentioned previously, this study suggests that people perceive that Montessori education does a good job encouraging creative thinking. In addition, rather than believing Montessori education is only for children with special needs, a misconception suggested by Chattin-McNichols (1998), respondents tended to believe that it was less effective meeting the needs of children with special needs. Perhaps the common criticisms cited by Chattin-McNichols (1998) but not found in the general public would be more prevalent in a group of educators who are more engaged in issues related to alternative educational approaches than the general public with less well developed attitudes toward education.

Finally, this study identified characteristics that were related to positive perceptions of Montessori education. Demographic characteristics of gender and age

were consistently found to be related to Montessori support, with women and older individuals tending to be more favorable than men. Perhaps older individuals feel more favorably about Montessori education because of its long history as an educational approach (Hainstock, 1997). Contributing to women's stronger support of Montessori education may be the fact that they were more supportive of education in general than men. In terms of attitudes, as expected, greater support for the role of schools beyond academics was related to more positive perceptions of Montessori education as was higher self-reported or actual knowledge of Montessori education. These results suggest a general understanding of Montessori's emphasis of educating the whole child rather than emphasizing academics alone (Lillard, P., 1972). In addition, these results imply that the level of support of Montessori education increases as understanding of the method grows. However, it is important to consider the alternative explanation that individuals who are more favorably disposed to Montessori education could be motivated to learn more about it.

Limitations

The key limitation of this study was the online panel source for the sample. While this medium provided an efficient way to obtain a large sample size, questions can be raised about the sample's representativeness of the general public. Efforts to balance the sample to reflect the 2000 Census mitigated these concerns as much as possible, but differences may still exist between those who were willing to participate

in an online panel in exchange for an incentive and those who were not. In addition, when comparing survey responses to the 2000 Census, more variation was evident in education than other demographic characteristics. Specifically, the sample contained a larger proportion of college graduates than the Census indicated. Some of this variation could be explained by the fact that the Census provided categories for respondents to indicate they had attended college but not attained a degree, while the survey only provided options for either high school graduate or college graduate. Survey respondents with some college but less than a degree may have identified themselves as college graduates rather than wishing to consider themselves to be only high school graduates. However, an alternative explanation may be that more highly educated individuals were more likely to participate in an online panel of the sort maintained by e-Rewards Market Research.

Implications for Practitioners

Despite the limitations discussed previously, this study provides practitioners with the first large scale study examining the general public's perceptions of Montessori education. These results suggest that the Montessori community can build off of the high level of awareness of the Montessori name in the general public as well as fairly positive predispositions toward the Montessori approach to education. Since greater understanding of Montessori education was shown in this study to be related to stronger support of the approach, enhancing the public's understanding of

Montessori education seems a clear mandate for the Montessori community.

Montessorians can leverage perceived strengths in fostering creativity and cooperation, challenging children's intellectual abilities, and allowing for individualized learning as the foundation for an educational campaign.

Montessorians have long believed that people outside the Montessori community lack an understanding of their approach to education (Chattin-McNichols, 1998). This study supports this contention and provides strong evidence for the need to educate the public regarding several aspects of Montessori education. This is particularly true for those aspects of Montessori education that are unique relative to other educational approaches.

First, the public clearly lacks understanding of the Montessori perspective on extrinsic rewards including such things as stickers, certificates and even teacher praise. Since extrinsic rewards are common in other school settings, their absence in Montessori environments may seem peculiar unless people understand that Montessori philosophy is based on the idea that students develop intrinsic motivation when the learning activity itself, not an external incentive, is its own reward (Rambusch & Stoops, 1992).

Second, the general public seems unaware of the emphasis the Montessori curriculum places on developing children's math skills through specially designed, hands-on materials. Helping people understand the role of the Montessori math materials in providing children with concrete representations of complex mathematical concepts represents a tremendous opportunity for broadening the

public's appreciation of a unique aspect of Montessori education which has been shown in research studies to be effective.

Finally, the public recognizes that developing children's concentration abilities is a goal of Montessori education, but opportunities exist for helping people understand specific practices employed to achieve this goal (i.e., providing opportunities for long stretches of uninterrupted work time allowing the child to determine the timing of changing activities). Better understanding of the reasons behind the unique structure of the schedule in a Montessori classroom will help people see that the differences from other educational environments is based on a comprehensive philosophy of child development.

Suggestions for Future Research

Similar research with other groups of participants would help to broaden understanding of the perceptions of Montessori education held by Montessori parents, educators outside of the Montessori community, and university faculty in schools of education without a particular emphasis on Montessori education. Parent education programs for Montessori schools would benefit from a clear picture of the areas of understanding and confusion of parents whose children currently attend Montessori schools. Parent education programs are popular outreach efforts of individual schools to help parents understand and appreciate their children's learning experiences

(American Montessori Society, n.d.b). Understanding the areas with the greatest confusion for parents would help schools tailor these programs to be most effective.

The perspective of educators and faculty outside the field of Montessori education would help Montessorians understand the challenges they face in being accepted among the mainstream of the educational community. Of particular interest would be perceptions of teachers in early childhood environments other than Montessori programs. As the AMS works toward its goal of making Montessori a significant voice in the field of education, the organization is encouraging Montessori researchers to broaden their horizons and present at non-Montessori educational conferences as well as gatherings of the Montessori community (C. Daoust, personal communication, February 29, 2008). Understanding the perspectives of organizers and attendees of such events will help Montessori researchers be more effective in their efforts at acceptance.

Finally, additional robust studies of Montessori educational outcomes like those conducted by Angeline Lillard and Nicole Else-Quest (2006) would serve the Montessori community by building a scientific foundation for the approach. Research on the effectiveness of Montessori education is difficult because of the diversity of schools calling themselves “Montessori” and because of the challenge in identifying a reasonable control group. Angeline Lillard and Nicole Else-Quest (2006) overcame these challenges by focusing on a well-established, recognized public Montessori school and conducting a study based on comparing students who attended the school to those who applied but were unable to attend because they were not selected

through a lottery process. Such studies will be crucial in the efforts of the AMS to gain acceptance of Montessori among the mainstream education community.

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Appendix A: Table of Specifications

Montessori knowledge

Please indicate whether you think each of the following statements about Montessori education is true or false.

Montessori education is available in public schools.	true	Gordon, 2005 American Montessori Society, n.d.b Association Montessori Internationale, n.d.a
Montessori education is always affiliated with a particular religion.	false	Chattin-McNichols, 1998, p. 13
Montessori education is only for preschoolers.	false	Lillard, 1996, back cover Seldin, 1999, p. 5

Please indicate whether you think each of the following statements about Montessori teachers is true or false.

Montessori teachers <i>most often</i>...		
evaluate children's learning by giving students tests based on the curriculum.	false	Lillard, 2005, p. 2, p. 29 Lillard & Else-Quest, 2006
evaluate children's learning by observing the children's work.	true	Lillard, 2005, p. 2, p. 21, p. 29 Lillard & Else-Quest, 2006
view learning as developing from within the child based on his/her experience.	true	Lillard, 2005, p. 28 Lillard, 1972, p. 50
see their role as transferring knowledge to children.	false	Rambusch & Stoops, 1992, p. 36 Lillard, 1972, p. 52, p. 54, p. 79 Lillard, 2005, p. 32
see their role as making learning seem like play.	false	Lillard, 1972, p. 37
motivate children through following the children's interests.	true	Rambusch & Stoops, 1992, p. 37 Lillard, 2005, p. 29, p. 31
motivate children by praising good work.	false	Rambusch & Stoops, 1992, p. 43 Lillard, 2005, p. 29
change activities frequently during the day to keep children interested.	false	Lillard, 1972, p. 54
schedule breaks for the class during work time to rest.	false	Lillard, 1972, p. 54
teach lessons for the entire class so everyone gets the information at the same time.	false	Rambusch & Stoops, 1992, p. 36 Lillard, 2005, p. 21
are more concerned with children's understanding concepts than correct answers.	true	Lillard, 1972, p. 63 Seldin, 1999, p. 6
keep detailed records on individual student's progress in the curriculum.	true	Lillard, 1996, p. 91

Please indicate whether you think each of the following statements about children in Montessori classes is true or false.

Children in Montessori classes <i>most often</i>...		
decide what they want to work on each day.	true	Rambusch & Stoops, 1992, p. 43 Lillard, 1972, p. 53, p. 54 Lillard, 2005, p. 30
work at their own pace.	true	Lillard, 1972, p. 60 Seldin, 1999, p. 6
are expected to sit quietly while doing their work.	false	Lillard, 2005, p. 21 Lillard, 1972, p. 55, p. 54
receive certificates, stickers or other forms of recognition for encouragement	false	Rambusch & Stoops, 1992, p. 43 Lillard, 2005, p. 29
get small prizes or rewards for good behavior.	false	Rambusch & Stoops, 1992, p. 43 Lillard, 2005, p. 29
are allowed to work together in small groups.	true	Rambusch & Stoops, 1992, p.43 Lillard, 2005, p. 21, p. 30, p. 32
have a large block of time to work without interruptions.	true	Rambusch & Stoops, 1992, p. 43 Lillard, 1972, p. 87
are expected to do their own work without help from classmates.	false	Rambusch & Stoops, 1992, p.43 Lillard, 2005, p. 26, p. 30 Seldin, 1999, p. 6

Please indicate whether you think each of the following statements about Montessori classrooms is true or false.

Montessori classrooms <i>most often</i> ...		
have activities for preschoolers for educating the senses.	true	Chattin-McNichols, 1998, p. 85 Lillard, 1972, p. 71-72
have multiple sets for each activity so that children do not have to wait for a turn.	false	Lillard, 1972, p. 58 Hainstock, 1997, p. 83
have specialized workbooks.	false	Seldin, 2000, p. 5
have hands-on materials for learning.	true	Rambusch & Stoops, 1992, p. 43 Lillard, 2005, p. 20, p. 30
have incentive charts on the wall recognizing children for good work.	false	Rambusch & Stoops, 1992, p. 43 Lillard, 1972, p. 55 Lillard, 2005, p. 29
have areas for pretend play for preschoolers.	false	Chattin-McNichols, 1998, p. 17, p. 52, p. 170
display papers with the highest grades on the bulletin board in elementary classes to showcase the best work.	false	Rambusch & Stoops, 1992, p. 43 Lillard, 1972, p. 55 Lillard, 2005, p. 29
include children of mixed ages.	true	Lillard, 1972, p. 75 Seldin, 1999, p. 5

Please indicate whether you think each of the following statements about the goals of Montessori education is true or false.

Primary goals of Montessori education include...		
helping children develop the ability to concentrate.	true	Lillard, 2005, p. 20, p. 31
teaching children to be respectful of others.	true	Lillard, 2005, p. 20
teaching children to value high grades.	false	Lillard, 2005, p. 29, p. 31
helping children to reach their individual potential.	true	Rambusch & Stoops, 1992, p. 36 Lillard, 1972, p. 77
keeping children on track with classmates at their grade level.	false	Seldin, 1999, p. 6
developing children's self-discipline.	true	Lillard, 1972, p. 52, p. 53
developing children's sense of community at school.	true	Rambusch & Stoops, 1992, p. 4 Lillard, 1972, p. 74
helping children gain a competitive edge in life.	false	Lillard, 1972, p. 55 Seldin, 2000, p. 6
motivating children to want to learn.	true	Lillard, 2005, p. 29 Seldin, 2000, p. 6
providing an orderly learning environment.	true	Lillard, 2005, p. 20-21, p. 29, p. 33 Lillard 1972, p. 56
helping children become independent people.	true	Rambusch & Stoops, 1992, p. 43 Lillard, 1972, p. 53 Lillard, 2005, p. 30
helping children become responsible people.	true	Lillard, 1972, p. 74 Seldin, 1999, p. 9
teaching children to cooperate with one another.	true	Lillard, 1972, p. 55 Seldin, 1999, p. 9
teaching children to rely on the teacher's feedback to know how they are doing on their work.	false	Rambusch & Stoops, 1992, p. 43 Lillard, 1972, p. 73. p. 89-90

Montessori Perceptions

Please indicate your level of agreement for each of the following statements based on whatever you know or have heard about Montessori education.

Montessori education...	
allows children too much freedom to choose their own work.	Rambusch & Stoops, 1992, p. 43 Chattin-McNichols, 1998, p. 15
is too structured in classroom activities.	Lillard, 2005, p. 21-22, p. 33 Lillard, 1972, p. 68 Chattin-McNichols, 1998, p. 15
motivates children to want to learn.	American Montessori Society, n.d.a Seldin, 1999, p. 7 Rambusch & Stoops, 1992, p.41, p. 44
focuses too much on academics for young children.	Lillard, 2005, p. 27 Chattin-McNichols, 1998, p. 19
is out of step with current educational practice.	Chattin-McNichols, 1998, p. 20
encourages children's curiosity.	Seldin, 1999, p. 6
challenges children to expand their intellectual abilities.	Lillard, 1996, p. 92 Rambusch & Stoops, 1992, p. 45

Montessori Support

Please indicate your level of agreement for each of the following statements based on whatever you know or have heard about Montessori education.

Montessori schools do a good job...	
helping children learn to cooperate with one another.	Seldin, 1999, p. 7 Damore, 2004, p. 32 Wentworth, 1999, p. 50 Rambusch & Stoops, 1992, p. 37
challenging children to expand their intellectual abilities.	Rambusch & Stoops, 1992, p. 38 Lillard, 1996, p. 92
meeting the needs of highly intelligent children.	Chattin-McNichols, 1998, p. 9
meeting the needs of children with special needs.	Chattin-McNichols, 1998, p. 9
developing children's problem solving skills.	Damore, 2004, p. 32
developing children's math skills.	Rambusch & Stoops, 1992, p. 45
developing children's reading skills.	Rambusch & Stoops, 1992, p. 45
developing children's writing skills	Rambusch & Stoops, 1992, p. 45
helping children learn to be independent people.	Rambusch & Stoops, 1992, p. 41, p. 44
helping children learn to be responsible people.	Rambusch & Stoops, 1992, p. 44-45
helping children develop the ability to concentrate.	Lillard, 1972, p. 4-5, p. 39, p. 60, p. 89 Lillard, 2005, p. 20, p. 31
teaching children to be respectful to others.	Rambusch & Stoops, 1992, p. 37 Damore 2004, p. 32
helping children to reach their individual potential.	Rambusch & Stoops, 1992, p. 36 Lillard, 1972, p. 77
developing children's self-discipline.	Lillard, 1972, p. 41 Rambusch & Stoops, 1992, p. 44
developing children's sense of community at school.	Damore, 2004 Lillard, 1972, p. 74
encouraging creative thinking.	Chattin-McNichols, 1998, p. 177 Lillard, 1972, p. 45
motivating children to want to learn.	Rambusch & Stoops, 1992, p. 37 Damore, 2004, p. 32
helping children learn <i>how</i> to learn.	Rambusch & Stoops, 1992, p. 45 Seldin, 1999, p. 7

Appendix B: Online Survey Instrument

General Public's Perceptions of Montessori Education

The Department of Psychology and Research in Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty.

We are conducting this study to better understand perceptions among the general public regarding educational issues. This will entail your completion of a questionnaire. The questionnaire is expected to take approximately 10 minutes to complete.

The content of the questionnaire should cause no more discomfort than you would experience in your everyday life. Although participation may not benefit you directly, we believe that the information obtained from this study will help us gain a better understanding of the general public's perceptions of and knowledge about educational topics. Your participation is solicited, although strictly voluntary. Your name will not be associated in any way with the research findings. It is possible, however, with internet communications, that through intent or accident someone other than the intended recipient may see your response.

If you would like additional information concerning this study before or after it is completed, please feel free to contact us by phone or mail. Completion of the survey indicates your willingness to participate in this project and that you are at least age eighteen. If you have any additional questions about your rights as a research participant, you may call (785) 864-7429 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email dhann@ku.edu.

Sincerely,

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Awareness of Montessori education

[SECTION TITLES FOR ORGANIZATIONAL PURPOSES ONLY; DO NOT DISPLAY]

[DISPLAY INTRO] The next section relates to one specific educational approach. You may or may not know much about it, but your responses are still valuable because we are interested in gathering a wide variety of opinions.

3. Have you ever heard the term “Montessori Education”?

- Yes
- No [SKIP TO STANDARD DEMOGRAPHICS]

4. How knowledgeable are you about Montessori education?

- | Not at all
knowledgeable | Somewhat
knowledgeable | Very
knowledgeable |
|-----------------------------|---------------------------|-----------------------|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Montessori knowledge questions [CORRECT ANSWERS *; DO NOT DISPLAY]

[SECTION TITLES FOR ORGANIZATIONAL PURPOSES ONLY; DO NOT DISPLAY]

[DISPLAY INTRO] The next series of questions relate to your perceptions of Montessori education. A wide variety of Montessori schools and classrooms exist, but most share some common characteristics. In the next series of questions, please provide the answer that you think is *most closely* associated with Montessori education, teachers, students, classrooms and goals. While all of the statements can probably apply to some Montessori classrooms at some time, please select the answers which you think are *most often true* in Montessori classrooms. You may or may not have any direct experience with Montessori education, so please base your answers on whatever you know or have heard.

5A. Please indicate whether you think each of the following statements about Montessori education is true or false. [RANDOMIZE LIST]

1. Montessori education is available in public schools.	<input type="radio"/> true*	<input type="radio"/> false
2. Montessori education is always affiliated with a particular religion.	<input type="radio"/> true	<input type="radio"/> false*
3. Montessori education is only for preschoolers.	<input type="radio"/> true	<input type="radio"/> false*

5B. Please indicate whether you think each of the following statements about Montessori teachers is true or false. [RANDOMIZE LIST]

Montessori teachers <i>most often...</i>		
1. evaluate children's learning by giving students tests based on the curriculum	<input type="radio"/> true	<input type="radio"/> false*
2. evaluate children's learning by observing the children's work	<input type="radio"/> true*	<input type="radio"/> false
3. view learning as developing from within the child based on his/her experience	<input type="radio"/> true*	<input type="radio"/> false
4. see their role as transferring knowledge to children	<input type="radio"/> true	<input type="radio"/> false*
5. see their role as making learning seem like play	<input type="radio"/> true	<input type="radio"/> false*
6. motivate children through following the children's interests	<input type="radio"/> true*	<input type="radio"/> false
7. motivate children by praising good work	<input type="radio"/> true	<input type="radio"/> false*
8. change activities frequently during the day to keep children interested	<input type="radio"/> true	<input type="radio"/> false*
9. schedule breaks for the class during work time to rest	<input type="radio"/> true	<input type="radio"/> false*
10. teach lessons for the entire class so everyone gets the information at the same time	<input type="radio"/> true	<input type="radio"/> false*
11. are more concerned with children's understanding concepts than correct answers	<input type="radio"/> true*	<input type="radio"/> false
12. keep detailed records on individual student's progress in the curriculum	<input type="radio"/> true*	<input type="radio"/> false

5C. Please indicate whether you think each of the following statements about children in Montessori classes is true or false. [RANDOMIZE LIST]

Children in Montessori classes <i>most often...</i>		
1. decide what they want to work on each day	<input type="radio"/> true*	<input type="radio"/> false
2. work at their own pace	<input type="radio"/> true*	<input type="radio"/> false
3. are expected to sit quietly while doing their work	<input type="radio"/> true	<input type="radio"/> false*
4. receive certificates, stickers or other forms of recognition for encouragement	<input type="radio"/> true	<input type="radio"/> false*
5. get small prizes or rewards for good behavior	<input type="radio"/> true	<input type="radio"/> false*
6. are allowed to work together in small groups	<input type="radio"/> true*	<input type="radio"/> false
7. have a large block of time to work without interruptions	<input type="radio"/> true*	<input type="radio"/> false
8. are expected to do their own work without help from classmates	<input type="radio"/> true	<input type="radio"/> false*

5D. Please indicate whether you think each of the following statements about Montessori classrooms is true or false. [RANDOMIZE LIST]

Montessori classrooms most often ...		
1. have activities for preschoolers for educating the senses	<input type="radio"/> true*	<input type="radio"/> false
2. have multiple sets for each activity so that children do not have to wait for a turn	<input type="radio"/> true	<input type="radio"/> false*
3. have specialized workbooks	<input type="radio"/> true	<input type="radio"/> false*
4. have hands-on materials for learning	<input type="radio"/> true*	<input type="radio"/> false
5. have incentive charts on the wall recognizing children for good work	<input type="radio"/> true	<input type="radio"/> false*
6. have areas for pretend play for preschoolers	<input type="radio"/> true	<input type="radio"/> false*
7. display papers with the highest grades on the bulletin board in elementary classes to showcase the best work	<input type="radio"/> true	<input type="radio"/> false*
8. include children of mixed ages.	<input type="radio"/> true*	<input type="radio"/> false

5E. Please indicate whether you think each of the following statements about the goals of Montessori education is true or false. [RANDOMIZE LIST]

Primary goals of Montessori education include...		
1. helping children develop the ability to concentrate	<input type="radio"/> true*	<input type="radio"/> false
2. teaching children to be respectful of others	<input type="radio"/> true*	<input type="radio"/> false
3. teaching children to value high grades	<input type="radio"/> true	<input type="radio"/> false*
4. helping children to reach their individual potential	<input type="radio"/> true*	<input type="radio"/> false
5. keeping children on track with classmates at their grade level	<input type="radio"/> true	<input type="radio"/> false*
6. developing children's self-discipline	<input type="radio"/> true*	<input type="radio"/> false
7. developing children's sense of community at school	<input type="radio"/> true*	<input type="radio"/> false
8. helping children gain a competitive edge in life	<input type="radio"/> true	<input type="radio"/> false*
9. motivating children to want to learn	<input type="radio"/> true*	<input type="radio"/> false
10. providing an orderly learning environment	<input type="radio"/> true*	<input type="radio"/> false
11. helping children become independent people	<input type="radio"/> true*	<input type="radio"/> false
12. helping children become responsible people	<input type="radio"/> true*	<input type="radio"/> false
13. teaching children to cooperate with one another	<input type="radio"/> true*	<input type="radio"/> false
14. teaching children to rely on the teacher's feedback to know how they are doing on their work	<input type="radio"/> true	<input type="radio"/> false*

Montessori attitude questions

[SECTION TITLES FOR ORGANIZATIONAL PURPOSES ONLY; DO NOT DISPLAY]

6. Please indicate your level of agreement for each of the following statements based on whatever you know or have heard about Montessori education.
[RANDOMIZE]

	Strongly Disagree		Neutral	Strongly Agree	
Montessori education...	1	2	3	4	5
1. allows children too much freedom to choose their own work (RS)	<input type="radio"/>				
2. is too structured in classroom activities (RS)	<input type="radio"/>				
3. motivates children to want to learn	<input type="radio"/>				
4. focuses too much on academics for young children (RS)	<input type="radio"/>				
5. is out of step with current educational practice (RS)	<input type="radio"/>				
6. encourages children's curiosity	<input type="radio"/>				
7. challenges children to expand their intellectual abilities	<input type="radio"/>				

RS=Reverse Score

7. Please indicate your level of agreement for each of the following statements based on whatever you know or have heard about Montessori education.
[RANDOMIZE]

	Strongly Disagree		Neutral	Strongly Agree	
Montessori schools do a good job...	1	2	3	4	5
1. helping children learn to cooperate with one another	<input type="radio"/>				
2. challenging children to expand their intellectual abilities	<input type="radio"/>				
3. meeting the needs of highly intelligent children	<input type="radio"/>				
4. meeting the needs of children with special needs	<input type="radio"/>				
5. developing children's problem solving skills	<input type="radio"/>				
6. developing children's math skills	<input type="radio"/>				
7. developing children's reading skills	<input type="radio"/>				
8. developing children's writing skills	<input type="radio"/>				
9. helping children learn to be independent people	<input type="radio"/>				
10. helping children learn to be responsible people	<input type="radio"/>				
11. helping children develop the ability to concentrate	<input type="radio"/>				
12. teaching children to be respectful to others	<input type="radio"/>				
13. helping children to reach their individual potential	<input type="radio"/>				
14. developing children's self-discipline	<input type="radio"/>				
15. developing children's sense of community at school	<input type="radio"/>				
16. encouraging creative thinking	<input type="radio"/>				
17. motivating children to want to learn	<input type="radio"/>				
18. helping children learn <i>how</i> to learn	<input type="radio"/>				

Custom Demographics

[SECTION TITLES FOR ORGANIZATIONAL PURPOSES ONLY; DO NOT DISPLAY]

The following few questions are for analysis purposes only.

D1. How many children do you have under the age of 18? _____ years

- No children under 18 [SKIP TO D2]

[IF 1] How old is your child? _____

- check here if less than 1 year old

[IF >1] Starting with your oldest child what are the ages of your children?

[INSERT NUMBER OF LINES FOR NUMBER OF CHILDREN INDICATED ABOVE]

		Is this child living in your home?	
Oldest child:	_____ years <input type="radio"/> check here if less than 1 year old	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Next child:	_____ years <input type="radio"/> check here if less than 1 year old	<input type="checkbox"/> Yes	<input type="checkbox"/> No
...			
Youngest child:	_____ years <input type="radio"/> check here if less than 1 year old	<input type="checkbox"/> Yes	<input type="checkbox"/> No

D2. Have you ever had your own child or children enrolled in a Montessori school?

- Yes, currently enrolled in a Montessori school
- Yes, previously enrolled in a Montessori school
- No, never enrolled in a Montessori school [SKIP]

[IF YES]

D3.

What is the youngest age that any of your children attended a Montessori school?

_____ years

What is the oldest age that any of your children attended a Montessori school?

_____ years

D4. As far as you know, was any Montessori school in which your child was enrolled affiliated with a national Montessori organization?

- Yes, the American Montessori Society
- Yes, the Association Montessori Internationale
- Yes, some other national Montessori organization
- No, not affiliated with any national Montessori organization
- Don't know

D5. Did your child(ren) attend a...

- Public Montessori school
- Private Montessori school
- Both public and private Montessori schools

D6. Does your local school district have any...

- Magnet schools
- Charter schools
- Both magnet and charter schools
- Neither magnet nor charter schools
- Don't know

Standard Demographics

[SECTION TITLES FOR ORGANIZATIONAL PURPOSES ONLY; DO NOT DISPLAY]

Q1.* Please select your gender. (Single)

1. Male
2. Female

Q2.* Please select your age. (Single)

1. 18 to 24
2. 25 to 34
3. 35 to 49
4. 50 to 64
5. 65 and above

Q3.* Which of the following best describes your ethnicity? (Single)

1. Native American, Inuit or Aleut
2. Asian American/Pacific Islander
3. African American/Black/Caribbean American
4. Hispanic Origin
5. Caucasian/White
6. Other

Q4. What is your marital status? (Single)

1. Married
2. Living with Partner
3. Single, Never Married
4. Other

Q5. What is the highest level of education you have achieved? (Single)

1. High School Graduate
2. College Graduate
3. Graduate School
4. Other

Q6.* What is your annual household income? (Single)

1. Less than \$25,000
2. \$25,000 to \$49,999
3. \$50,000 to \$74,999
4. \$75,000 to \$99,999
5. \$100,000 and above

Q7. Please select the state or territory in which you live from the list below. (Single)

- | | |
|------------------------------------|------------------------------|
| 1. Armed Forces - Americas | 20. Idaho |
| 2. Armed Forces - Europe | 21. Illinois |
| 3. Alaska | 22. Indiana |
| 4. Alabama | 23. Kansas |
| 5. Armed Forces - Pacific | 24. Kentucky |
| 6. Arkansas | 25. Louisiana |
| 7. American Samoa | 26. Massachusetts |
| 8. Arizona | 27. Maryland |
| 9. California | 28. Maine |
| 10. Colorado | 29. Marshall Islands |
| 11. Connecticut | 30. Michigan |
| 12. District of Columbia | 31. Minnesota |
| 13. Delaware | 32. Missouri |
| 14. Florida | 33. Northern Mariana Islands |
| 15. Federated States of Micronesia | 34. Mississippi |
| 16. Georgia | 35. Montana |
| 17. Guam | 36. North Carolina |
| 18. Hawaii | 37. North Dakota |
| 19. Iowa | 38. Nebraska |

- | | |
|--------------------|--------------------------------|
| 39. New Hampshire | 52. South Dakota |
| 40. New Jersey | 53. Tennessee |
| 41. New Mexico | 54. Texas |
| 42. Nevada | 55. Utah |
| 43. New York | 56. Virginia |
| 44. Ohio | 57. Virgin Islands of the U.S. |
| 45. Oklahoma | 58. Vermont |
| 46. Oregon | 59. Washington |
| 47. Pennsylvania | 60. Wisconsin |
| 48. Puerto Rico | 61. West Virginia |
| 49. Palau | 62. Wyoming |
| 50. Rhode Island | 99. None of the above |
| 51. South Carolina | |

*part of quota for balancing to 2000 Census

Appendix C: Exploratory Factor Analyses Detailed Results

This study incorporated composite scores for perceptions of Montessori education, support of the role of schools beyond academics, and attitudes toward the performance of schools in America. The Methods section stated that exploratory factor analyses were conducted individually for each of these three composite scores to gauge the degree to which they were unidimensional measures of the constructs they were designed to measure. This Appendix provides details of the exploratory factor analyses that were conducted for each of these three composites. For all analyses, the extraction method was principal axis factoring with a promax rotation when necessary to aid in interpretation. Promax rotation was selected because it allows for correlation among the factors (Tabachnick & Fidell, 2001).

Perceptions of Montessori education. The dimensionality of the 18 items measuring support of Montessori education was analyzed using principal axis factoring. A one factor solution was most appropriate because the first factor extracted accounted for 70.48% of the variance and the scree plot suggested a one factor solution (Figure C-1). Furthermore, all 18 items loaded fairly strongly on the first factor extracted (from .60 to .90). Table C-1 provides the factor loadings. Extracting a second factor only accounted for an additional 2.65% of variance and the second factor was highly correlated with the first factor ($r = .82$). Similar results were

found using a maximum likelihood extraction method. The scree plot, factor interpretability, and consistent results across two different extraction methods all pointed to a one factor solution. Thus, creating a single Montessori support composite measure based on the 18 attributes was supported.

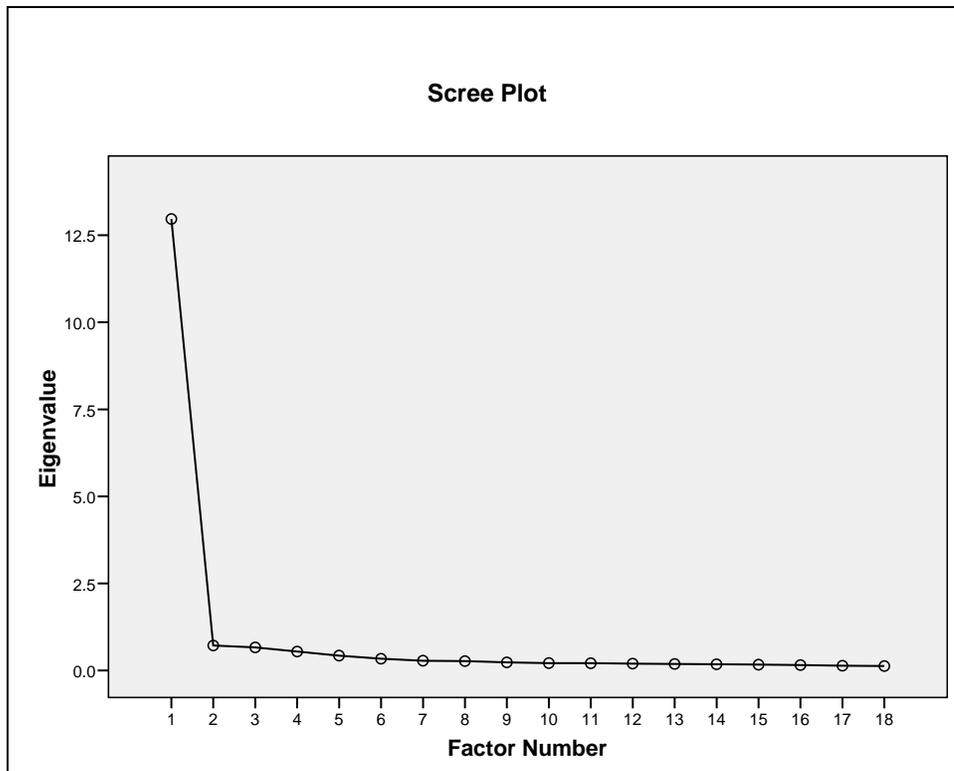


Figure C-1. EFA of items comprising the Montessori support composite.

Table C-1

Factor Loadings of the Items Comprising the Montessori Support Composite

Level of agreement that Montessori schools do a good job	Loadings
1. helping children learn to cooperate with one another	.86
2. challenging children to expand their intellectual abilities	.89
3. meeting the needs of highly intelligent children	.76
4. meeting the needs of children with special needs	.60
5. developing children's problem solving skills	.89
6. developing children's math skills	.78
7. developing children's reading skills	.86
8. developing children's writing skills	.83
9. helping children learn to be independent people	.87
10. helping children learn to be responsible people	.89
11. helping children develop the ability to concentrate	.84
12. teaching children to be respectful to others	.88
13. helping children to reach their individual potential	.88
14. developing children's self-discipline	.85
15. developing children's sense of community at school	.80
16. encouraging creative thinking	.83
17. motivating children to want to learn	.90
18. helping children learn how to learn	.87

Attitudes toward the performance of schools in America. To understand the relationship between attitudes toward education in general and perceptions of Montessori education, a composite score was calculated based on the 18 questions regarding attitudes toward the performance of schools in general. The dimensionality of the 18 items measuring perceptions of the performance of schools in America was analyzed using principal axis factoring. The one factor solution was chosen because the first factor extracted accounted for 58.92% of the variance and the scree plot suggested a one factor solution (Figure C-2). Furthermore, all 18 items loaded at a reasonable level on the first factor extracted (from .55 to .82). Table C-2 provides the

factor loadings as well as descriptive statistics for the 18 items. When two factors were extracted, the second factor accounted for only an additional 2.80% of variance and the second factor was highly correlated with the first factor ($r = .82$). Similar results were found using the maximum likelihood extraction method. The scree plot, factor interpretability, and consistent results across two different extraction methods all pointed to a one factor solution. Thus, creating a single measure to represent perceptions of the performance of schools in America was reasonable.

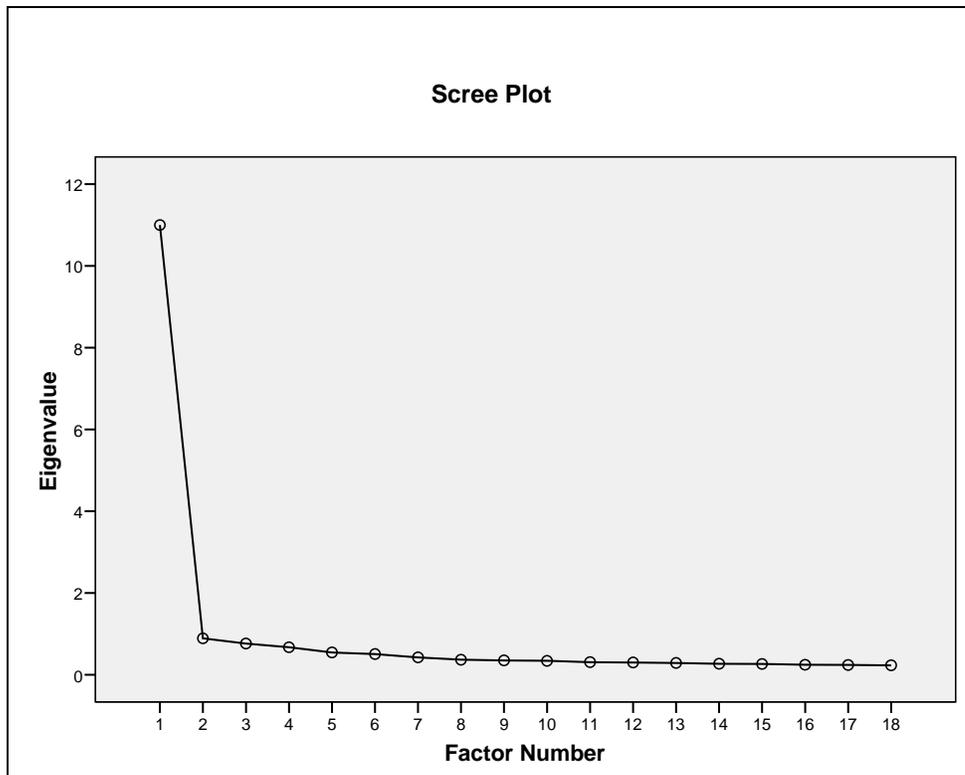


Figure C-2: EFA of items comprising performance of schools in America composite.

Table C-2:

Factor Loadings and Descriptive Statistics for the Items Comprising Performance of Schools in America Composite

Level of agreement that schools in America do a good job	<i>M</i>	<i>SD</i>	Factor Loadings
1. helping children learn to cooperate with one another	3.00	1.03	.74
2. challenging children to expand their intellectual abilities	2.84	1.10	.82
3. meeting the needs of highly intelligent children	2.92	1.21	.62
4. meeting the needs of children with special needs	3.07	1.11	.55
5. developing children's problem-solving skills	2.90	1.06	.82
6. developing children's math skills	2.88	1.12	.77
7. developing children's reading skills	3.05	1.13	.78
8. developing children's writing skills	2.83	1.09	.79
9. helping children learn to be independent people	2.85	1.02	.75
10. helping children learn to be responsible people	2.77	1.08	.82
11. helping children develop the ability to concentrate	2.66	1.02	.81
12. teaching children to be respectful to others	2.65	1.13	.75
13. helping children to reach their individual potential	2.77	1.06	.82
14. developing children's self-discipline	2.57	1.07	.79
15. developing children's sense of community at school	2.99	0.99	.72
16. encouraging creative thinking	2.87	1.08	.78
17. motivating children to want to learn	2.74	1.05	.82
18. helping children learn how to learn	2.65	1.13	.81

Support for role of schools beyond academics. A composite for attitudes toward the desired role of education in America overall was calculated. The roles examined ranged from those that were more academically oriented such as success on standardized tests to those that were more holistic in nature such as cooperation and creativity. An exploratory factor analysis was conducted to determine if the seven items could be used to create one single composite for the desired role of schools, or

if multiple dimensions of appropriate roles of schools were present. The exploratory factor analysis identified one clear factor for the four items related to the role of school beyond academics. These items are listed in Table C-3. However, the remaining three more academically oriented items (competitive edge, academic skills over social skills, and success on standardized tests) did not load either on the first factor or on a second factor. In fact, these remaining three items, did not share much variance. Correlations among the three remaining items ranged from .06 to .21 ($N = 1,025$). Thus, the dimensionality of the four items measuring support of the role of schools beyond academics was analyzed using principal axis factoring. Since only four items were included in the scale, a one factor solution was the only outcome examined. The one factor solution was appropriate because the first factor extracted accounted for 65.44% of the variance and the scree plot supported a one factor solution (Figure C-3). Furthermore, all four items loaded highly on the first factor extracted (from .75 to .85). Table C-3 provides descriptive statistics on the four items as well as factor loadings. Similar results were found using a maximum likelihood extraction method. The scree plot, factor interpretability, and consistent results across two different extraction methods all supported a one factor solution. Thus, creating a single measure to represent support for the role of schools beyond academics was deemed appropriate.

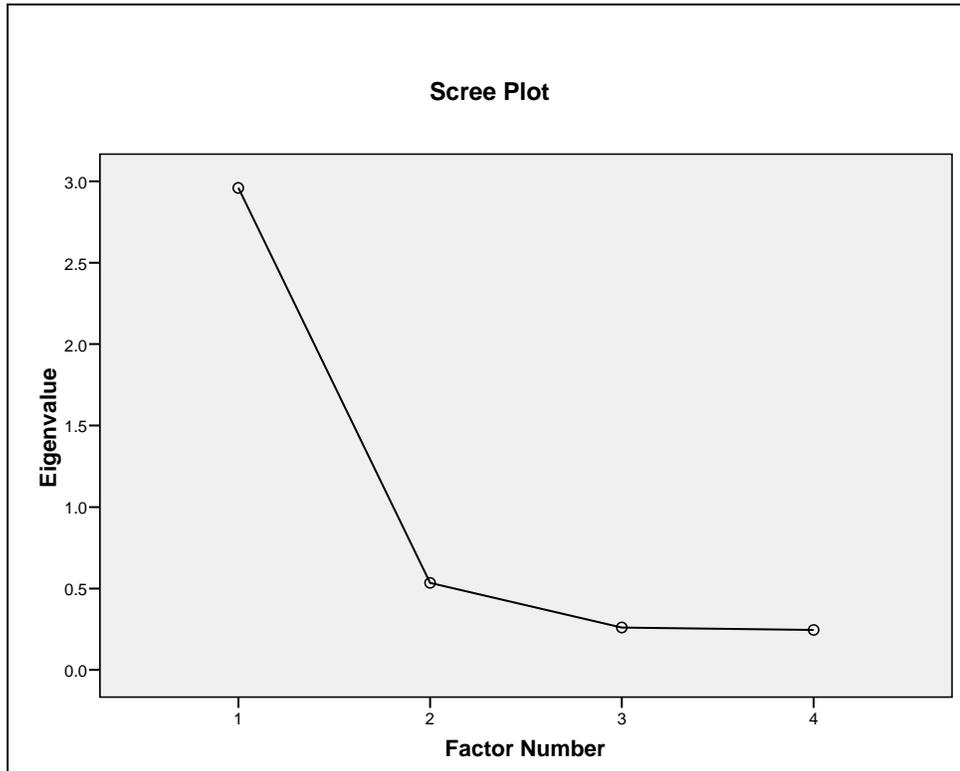


Figure C-3: EFA of items comprising support for role of schools beyond academics.

Table C-3

Factor Loadings and Descriptive Statistics for Items Comprising Support for Role of Schools beyond Academics

Level of agreement that in general schools in America should...	<i>M</i>	<i>SD</i>	Factor Loadings
1. help children learn to cooperate with one another	4.14	1.04	.85
2. develop children's sense of community at school	3.94	1.03	.75
3. encourage creative thinking	4.38	1.01	.83
4. motivate children to want to learn	4.47	1.04	.81