



# Authentic Montessori: The Dottoressa's View at the End of Her Life Part II: The Teacher and the Child

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**Abstract:** Part II of this two-part article continues the discussion of what Maria Montessori viewed to be the important components of her educational system. Because she developed the system over her lifetime, we prioritized later accounts when contradictory accounts were found. Whereas Part I focused on the environment, Part II examines the second and third components of the Montessori trinity: the teacher and the child. This article includes descriptions of Montessori teacher preparation, children's developmental stages, and the human tendencies on which Montessori education capitalizes. It ends with child outcomes as described by Dr. Montessori and as shown in recent research, and provides an appendix summarizing features of authentic Montessori described in Part I and Part II.

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Over approximately 50 years, Maria Montessori gradually developed a system of education that she came to view as a *trinity* composed of the environment, the teacher, and the child. In Part I, we described how, she ultimately envisioned a proper Montessori classroom environment. Here in Part II, we describe the second and third parts of the Montessori trinity (or triangle): the teacher and the child. We conducted this work by carefully reading Dr. Montessori's books and compiling quotations describing the system; when contradictions appeared, later works were preferred. We also consulted the archives of the Association Montessori Internationale (AMI) for descriptions of the teacher preparation that Dr. Montessori used. We include these descriptions of teacher preparation and of what Mario Montessori (1956) described as the basic human tendencies, as well as of child outcomes described by Dr. Montessori and by recent research.

As we emphasized in Part I, the term *authentic* is used to denote “done in the traditional or original way” (*Oxford English Dictionary*, 2019), not to imply that alterations to what she developed create systems that are necessarily inferior. We urge empirical study of the variations to determine whether they improve or detract from the system bequeathed by Dr. Montessori, and we supply the present description to provide a benchmark from which variations can be measured. We render descriptions in the present tense to reflect that some Montessori schools today use an authentic implementation.

### The Teacher

*Our care of the child should be governed, not by the desire to “make him learn things,” but by the endeavor to always keep burning within him that light which is called intelligence.*  
(Montessori, 1917/1965, p. 240)

A Montessori teacher has three essential tasks: to prepare the environment, to set the children free in it, and, once children begin to concentrate, to observe without interfering in children’s self-construction, (i.e., the process by which children actively and gradually create their own knowledge and understanding and, eventually, their adult self). Dr. Montessori went to great lengths to highlight the importance of a particular style of observation.

*The first step to take in order to become a Montessori teacher is to shed omnipotence and to become a joyous observer. If the teacher can really enter into the joy of seeing things being born and growing under his eyes, and can clothe himself in the garment of humility, many delights are reserved for him that are denied in those who assume infallibility and authority in front of a class.* (Montessori, 1948/1967, p. 122)

The teacher, unbeknownst to the children, thus evaluates the class on an ongoing basis and introduces new work to children at appropriate times. Developing the necessary attitude and the sensitivity to correctly evaluate what is needed requires that teachers have special training, which is briefly described at the end of this section.

### The Teacher’s Role

**Preparing the environment.** The teacher’s first major task is to prepare the environment in which he or she will set each child free. This environment was mostly described in Part I; one feature of the environment not described in Part I is the teacher. Dr. Montessori was specific about how a teacher should prepare him- or herself: “The teacher expects the children to be orderly and so she must be orderly.... The teacher... must be well cared for and well dressed. She must be clean and tidy and form part of the attractiveness of the environment” (Montessori, 1989, p. 14). The authentic Montessori teacher is “warm, caring, and understanding” (Montessori, 2012, p. 114), shows “respect [and is] humble” (Montessori, 2012, p. 34). However, in relation to the children, the teacher is also “superior, and not just a friend.... The teacher and the children are not equals [and] the children must admire the teacher for her importance. If they have no authority, they have no directive” (Montessori, 2012, p. 230).

In Montessori theory, the teacher’s attitude toward the children is founded on a desire to serve humanity and a willingness to step out of the limelight to allow the children to show him or her where they are in their development through their work. The greatest sign of success for a Montessori teacher is to be able to say, “The children are now working as if I did not exist.... I have helped this life to fulfill the tasks set for it by creation”(Montessori, 1967/1995, p. 283). Many people have observed that children in Montessori classrooms do not change their behavior when the teacher is absent; rather they continue working and conversing just as they do when the teacher is there (Lillard, 2017, p. 106; Montessori, 1939, pp. 165–166).

**Setting the children free.** Once the environment is prepared and the children are present, there is a preliminary period before the class becomes a true Montessori class. Dr. Montessori called this “the collective stage of the class [when] the teacher can also sing songs, tell stories, and give the children some toys” (Montessori, 1994a, p. 183). The Primary teacher in this stage begins to show children how to use Practical Life materials, conveying “interest, seriousness, and attention” (Montessori, 2012, p. 75). However, if the class becomes chaotic, the teacher engages the children in a group activity like clapping or moving chairs together (Montessori, 2012, p. 230). Then and always, “the teacher must first study how to help the children to concentrate” (Montessori, 2012, p. 224); early on, a teacher needs to “use any device to win the children’s attention” (Montessori, 1946/1963, p. 87). Teachers must be patient because “children do not become little angels overnight” (Montessori, 2012, p. 216). In *The Discovery of the Child*, Dr. Montessori discussed some of the difficulties encountered when establishing a classroom and how a teacher should respond (Montessori, 1962/1967).

But finally, one by one, children begin to concentrate. Concentration often begins with Practical Life activities (Montessori, 2012, p. 74), but it could also occur with moving furniture or watching a bug: “The [Montessori] material has not yet suitable conditions for its presentation” (Montessori, 1946/1963, p. 88). Dr. Montessori noticed, and believed teachers too should notice, that with the onset of deep concentration, children’s personalities begin to change.

*After the children concentrate, it is really possible to give them freedom. The teacher must...give them many opportunities for activity. She must give them material—an abundance of material—because once these children concentrate, they become very active and very hungry for work.... The teacher must see that there are many possibilities for work in the environment.* (Montessori, 2012, p. 232)

**Noninterference.** Once concentration begins, Dr. Montessori was very clear: teachers must not interrupt.

*The teacher must recognize the first moment of concentration and must not disturb it. The whole future comes from this moment and so the teacher must be ready for non-interference when it occurs. This is very difficult because the teacher has to interfere at every moment before the child is normalized.* (Montessori, 1989, p. 15)

Dr. Montessori used the word *normalized* to mean “a return to normal conditions” (Montessori, 1936, p. 169), when the child is not perturbed in his or her development.

*As soon as concentration appears, the teacher should pay no attention, as if that child did not exist. At the very least, he must be quite unaware of the teacher’s attention. Even if two children want the same material, they should be left to settle the problem for themselves unless they call for the teacher’s aid. Her only duty is to present new material as the child exhausts the possibilities of the old.* (Montessori, 1946/1963, p. 88)

Dr. Montessori observed that teachers typically try to do too much. As with parents, it is difficult for them not to interfere—they praise children or correct mistakes when, in the Montessori view, they should instead oversee the environment in a way that protects the child’s absorption in work. She gave teachers some hints for how to hold themselves back from interfering with children’s self-development (e.g., wait 2 minutes or count a string of beads; Montessori, 1994b, p. 34). She also believed that classrooms with a large number of children and a small number of adults reduces adult interference.

Dr. Montessori’s books usually describe classrooms with only a single teacher for the 30 to 40 (or even more) children (see Part I for citations on this point). She once mentioned a school with classrooms of 30 children and one teacher and “sometimes with an assistant” (Montessori, 1989, p. 67), but assistants in the classroom appear to have been rare. Current teacher–child ratio regulations may require more adults, but Dr. Montessori was concerned that the presence of more adults in the classroom leads to more interference with

children's development. This raises two key principles that recur in Dr. Montessori's writings: (a) every bit of unnecessary assistance given to a child interferes with the child's self-development, and (b) the role of the teacher is limited: "In our schools the environment itself teaches the child. The teacher only puts the child in direct contact with the environment, showing him how to use various things" (Montessori, 1956, p. 138).

**Presentations.** Besides tending the children's environment, and respectfully giving children freedom to self-construct, integral to the Montessori teacher's role are the timing, content, and spirit of lessons, termed *presentations*, since typically a material and its use is presented. The teacher determines what a child is ready for next and introduces that activity at the right moment and in a captivating way, "as something of great importance" (Montessori, 1994a, p. 194). Dr. Montessori believed that "knowledge must be taken in through the imagination and not through memorization" (Montessori, 2012, p. 192). Correctly timing presentations requires continuous, close, and sensitive observation, as well as good record keeping and lesson planning: "You may have a beautiful orderly class, but if you abandon it, it will be lost after a time" (Montessori, 2012, p. 237). Thus, Dr. Montessori was specific about the timing and spirit with which teachers give presentations. For teachers to regularly and correctly present each material in a sequence in a timely manner, they must keep detailed and organized records on each child.

**Evaluation.** Dr. Montessori did not support the idea of tests as commonly conceived (e.g., typical multiple-choice tests).

*How can the mind of a growing individual continue to be interested if all our teaching is around one particular subject of limited scope, and is confined to the transmission of such small details of knowledge as he/she is able to memorize?* (Montessori, 1948/1967, p. 6).

Yet, of course, a teacher must evaluate student progress. Dr. Montessori's books suggest that teachers evaluate students in at least two ways. First, the teacher observes children intensely, noticing what they are doing and appear to understand. In the course of this observation, a teacher may notice a child using a material incorrectly; for example, a child may neglect to trace the outside of a geometric form. In theory, this tracing action embodies the concept; for example, the child feels with his or her hand and arm what a pentagon is. Therefore, by neglecting to trace the shape, the child fails to embody the concept. In such a case, no immediate correction is given. What matters is that a child is engaged with the material; correctness will come. "If we correct him, we humiliate and discourage.... So the only way to correct the child is to prepare this material and give him the technique" (Montessori, 1994a, p. 191). The teacher simply notices the child's error and gives the presentation again later. Dr. Montessori expressed faith that through repetition, children will eventually learn, and that problems will typically be resolved without teacher correction. Her belief is consistent with the idea that humans under normal conditions have a tendency toward virtuosity; they get pleasure out of striving toward perfection (Kubovy, 1999). Since most Montessori materials have the feature of *control of error*, meaning the materials reveal one's mistakes, then if children do naturally strive for perfection, repetition will naturally lead to children using materials in the right way. The second way that teachers evaluate student progress is to check, via observation or discussion, children's knowledge prior to or while presenting a new lesson. This process is formalized in the three-period lesson (Montessori, 1994a, p. 204), in which teachers first give new information and then, in the course of conversation or through students' work, see that children can recognize the information, and, finally, in the third period, that children can even recall the information without prompting.

Supporting this last point, psychologists have discovered a *testing effect*: when people have already learned information (e.g., which new foreign word corresponds to a native word), future retrieval of that knowledge is improved not so much by further study as by repeated testing of the material (Karpicke & Roediger, 2008). One might ask if the testing effect means Montessori education would do well to test children in more-typical ways, but testing is built into the system Dr. Montessori designed. As just noted, the second two periods of the three-period lesson are recognition and recall tests. In addition, when children learn material, they try to recall what they can (e.g., the names of African countries while doing a Puzzle

Map), and then they use a different material (e.g., a Control Map) to determine for themselves whether they were correct. A third type of recall test that children repeatedly engage in after age 6 involves presenting material to others, as when giving oral reports. Montessori education therefore may already involve repeated, but perhaps relatively unstressful, testing of the sort that has been shown to improve learning.

In sum, an authentic program has a single Montessori teacher whose task is to guide, facilitate, and observe the community of children. In many places today, more adults are required in the classroom for state accreditation, a change to Dr. Montessori's approach that is ripe for empirical study.

### Teacher Preparation

Dr. Montessori believed teaching with her system required self-study and sometimes even fundamental change: "A Montessori teacher must be created anew, having rid herself of pedagogical prejudices" (Montessori, 1946/1963, p. 86). She spoke repeatedly of teacher preparation involving spiritual and moral transformation, cultivating humility and patience, sympathy and charity.

*This method [of education] not only produces a reformed school but above all a reformed teacher, whose preparation must be much deeper than the preparation traditionally offered. [The] mission is to be a scientist and a teacher: a teacher in the sense of an observer who respects life, drinking in the manifestations and satiating [the] spirit. Hence it greatly raises the personality of the teacher.* (Montessori, 2013, p. 276)

She said that the transformation to becoming a real teacher requires time and deep personal work.

*It is not so easy to educate anyone to be a good teacher. It is not enough to study at a university. Perfection is a part of life; in order to achieve it, we must make a long study. Conversion cannot come to everybody. We must patiently try to understand and act on our understanding. Our conversion must be in the heart.* (Montessori, 2012, p. 26)

The teacher preparation required for both undergoing this personality change and learning the Montessori system, including its extensive set of materials, is quite involved.

The teacher preparation that Dr. Montessori ultimately delivered lasted about five months and included about 180 hours of lectures on the principles of education and child development, as well as lectures that included demonstrations of how to present and use the materials, how to prepare the classroom, and the teacher's role in starting and conducting the class (Montessori, 1948; see Figure 1). At its most developed (Montessori, 1994b, 2012), teacher preparation included more than 50 hours of lectures to cover all the materials, including their presentation, direct and indirect aims, target age range, and how the materials are self-correcting. There were also 50 hours of classes in which teachers-in-training practiced presenting the materials until they could do so perfectly and in which they also experimented with alternative ways of using the materials.

*To keep a child within certain limits, [the teacher] must offer the material to [children], following a certain technique. So the teacher must have a direct communication with this material, and use it with the necessary exactitude. She must practice repeatedly in order to experiment and discover within herself the difference between using the material incorrectly and using it with exactness.* (Montessori, 1994b, p. 107)

Dr. Montessori urged teachers to experience the materials as a child would. In her own house, she often left materials out on the coffee table for continual exploration (Standing, 1957).

To enable teachers to learn to see children objectively and detect their needs, training also required at least 50 hours of observation: "The eyes of the teacher must be trained. A sensitivity must be developed in the teacher to recognize this ephemeral phenomenon of concentration when it occurs" (Montessori, 2012, p. 226). Eventually in this process, a developing teacher becomes "afire with interest, 'seeing' the spiritual

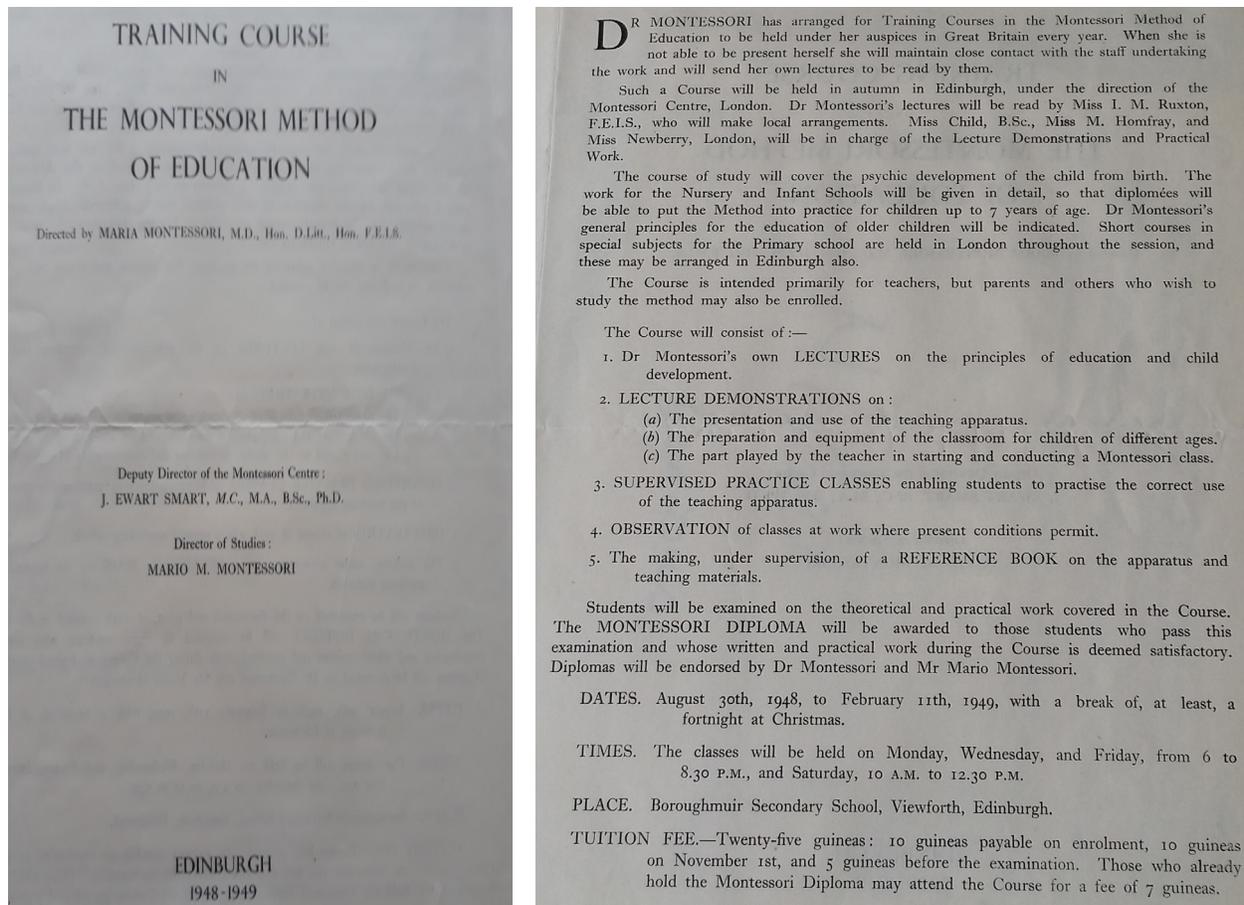


Figure 1. Description of a Montessori teacher preparation course (Montessori, 1948).

phenomena of the child, and experiences a serene joy and an insatiable eagerness in observing them.... At this point she will begin to become a “teacher” (Montessori, 1917/1965, p. 141). Along with the teacher-trainer monitoring and observing these developments in budding teachers, written and oral exams were administered at the end of the courses. Oversight of the examinations for AMI courses was (and remains today) centralized at AMI headquarters in Amsterdam.

To help teachers-in-training to learn the material as well as to provide a manual and guide for their later teaching, they were also required to create reference books, often referred to as *albums*, rendering their lecture notes complete with illustrations, which the teacher trainers read for accuracy and understanding. Supporting this practice, research suggests that writing one’s own notes—and by hand, not with a computer—results in a deeper conceptual understanding of the material (Mueller & Oppenheimer, 2014).

We have provided details about the teacher preparation provided by AMI because it is the organization Dr. Montessori founded to carry on her work and thus fits our definition of authentic or the state of the art at her death. It may be of interest to readers that her son Mario extended the duration of AMI courses to at least one academic year (personal communication, J. Verheul, January 31, 2018, based on a letter from Mario M. Montessori to Prof. Sulea Firu, December 1, 1976). He appears to have taken this action because he and Dr. Montessori found that even the intensive teacher-preparation courses were not necessarily enough to prepare a teacher.

*Sometimes, the teacher in our schools succeeds very quickly and very easily. Very often she succeeds in practice only after long experience. This depends upon the nature of her spirit.*

*She may need a long period of training in order to change her spirit and give it another form. This comes with practice, contact with children, and experience.* (Montessori, 1994a, pp. 104–105).

Demonstrating that the course itself had not always fully prepared them, teachers wrote letters to Dr. Montessori describing their classes and soliciting advice after training was over.

Dr. Montessori did not consider completion of her course sufficient for becoming a trainer of new teachers; the course pamphlets and diplomas from as early as 1914 explicitly stated that the diploma enables pupils to direct Children's Houses but not to train other teachers. It is unclear what she required for other trainers, as there were very few in her lifetime. Her son Mario was a trainer for the 1939 India course (he had received his diploma in 1925), and Claude Claremont ran a 2-year residential course in London. Undoubtedly, there were others whom she believed understood the system well enough to train teachers, and others helped with the practicums; for example, the Edinburgh brochure excerpted in Figure 1 named three people who did lecture demonstrations and practical work for the course.

### Summary

Dr. Montessori believed that the teacher's role is to prepare the environment and then set the children free there, connecting children to the materials at appropriate times to engender states of deep concentration and wonder. Careful and astute observation is required to determine when interference is helpful, when children have mastered a material, and what new materials to present and when. Teachers typically want to do too much; learning to sit back and not interfere is crucial. In addition to listening to lectures, engaging in practicums, doing observations, creating albums, and passing examinations, Montessori teachers were expected to undergo a deep, spiritual transformation.

### The Child

Dr. Montessori had a particular view of children and saw particular outcomes resulting from the system she developed.

*The child is...capable of developing and giving us a tangible proof of the possibility of a better humanity [and] has shown us the true process of construction of the whole human being. We have seen children totally change as they acquire a love for things and as their sense of order, discipline and self control develops within them.... The child is both a hope and promise for mankind.* (Montessori, 1932/1992, p. 35)

In this section, we discuss Dr. Montessori's view of children, along with her stage theory and the human tendencies around which the Montessori system is constructed. Finally, we elucidate her view of the outcomes of this system of education.

### How Development Occurs

Underpinning Montessori education is a view of children that was revolutionary in the early 1900s but is well accepted today. Fundamentally, this view is that, although children can be taught pieces of information (Harris, 2012), development occurs through self-construction. Conventional education is more oriented to the former view (see Resnick & Hall, 1998), whereas Montessori education is oriented to the latter.

Dr. Montessori derived her views about self-construction from watching very young children. Human babies essentially teach themselves how to get milk from the breast, grasp objects, crawl, and walk. She often used the example of language, noting that at around four months of age, children become intensely fo-

cused on adults' mouths when the adults speak (e.g., Montessori, 1961/2007, p. 27), a conclusion confirmed by current scientific methods (Lewkowicz & Hansen-Tift, 2012). Long before Noam Chomsky (1993) became famous for the same idea, Dr. Montessori repeatedly pointed out that learning language is an innate ability and that children everywhere learn language on a similar schedule, despite the varying levels of complexity of the different languages they learn. Further, they are not taught to do this; rather, they absorb language from the environment. Language is a supreme example of how children self-construct when their environment provides them appropriate raw material and the freedom to develop themselves. Assisting their self-construction is the fact that they gravitate to their "zone of proximal development" (Vygotsky, 1978), in other words, what is just beyond their current level of development. For example, infants seek stimuli that are challenging (but not too challenging) for them to perceive, a phenomenon recently dubbed *the Goldilocks effect* (Kidd, Piantadosi, & Aslin, 2012, 2014).

Dr. Montessori believed a children's self-construction has a blueprint and is guided by mental powers that are unique to each developmental period, stages she termed *planes of development*, which are depicted in Figure 5 in Part 1, where they were discussed with reference to the environment and materials offered at each stage. Here we discuss the stages with reference to children.

### Planes of Development

Dr. Montessori attributed to William James an insight that child development can be likened to the metamorphic stages of a butterfly (Montessori, 2017), in that development is not simply a matter of growing and accruing, but that at each stage a child has a fundamentally different mind. Her system of education was adjusted at each stage to meet children's changing needs. Like many other theorists (see Part I), she saw three main stages of childhood, and a fourth stage as one enters adulthood (not discussed here).

**The first plane: The absorbent mind.** For a newborn child, the world is in most ways completely novel—all the sights and smells and tactile elements are new; only the sounds that penetrated the uterine wall and some tastes are familiar. Children are also relatively helpless, beholden to their caretakers for food and shelter. However, newborns also have the power to build their future selves and eventually become persons of their time, place, and culture. Certain qualities assist this early development and characterize the period from birth to 6 years.

Dr. Montessori observed that during this first stage, children effortlessly absorb many aspects of the environment, including language and culture, and that they do so without fatigue. This absorption is indiscriminate, incorporating both good and bad. However, these qualities disappear by the age of 6, when conscious learning takes hold.

*This absorbent mind does not construct with a voluntary effort but according to the lead of "inner sensitivities" which we call "sensitive periods" as the sensitivity lasts only...until the acquisition to be made according to natural development has been achieved. (Montessori, 1949/1974, p. 85)*

During sensitive periods, particular elements in the environment evoke very strong interest, facilitating learning. For example, Dr. Montessori described the age of 2 as a sensitive period for order; she noted that children who see things out of place become upset and try to restore order (e.g., Montessori, 1967/1995, pp. 134–135). Montessori education capitalizes on these theorized sensitivities, for example, by showing young children precise ways to use and store materials.

*Little children have, during their sensitive periods, powers that disappear later on in life. Once a sensitive period is over, the mind has acquired the special faculty, which this sensitivity helped construct; the individual must now learn in a different way. Whereas the small*

*child learns easily, older children learn because they wish to learn, but they do so with effort.* (Montessori, 2012, p. 18)

**The second plane: The reasoning mind.** “The passage [from the first] to the second level of education is the passage from the sensorial, material level to the abstract” (Montessori, 1948/1976, p. 11). During this period, Dr. Montessori claimed children have an insatiable appetite for knowledge and are eager to explore with a reasoning mind, which begins to assert itself strongly: “From seven to twelve years, the child needs to enlarge his field of action” (Montessori, 1948/1976, p. 9). Children start wanting to understand the reasons behind things. No longer satisfied in a small community of the family and the preschool classroom, a child in the second plane wants to be part of a herd and engage predominantly in small-group work. The child “will try to get out, to run away, as he wants to augment the number of people who are in real relation with him” (Montessori, 1994a, p. 126). The Montessori system accommodates this in part with the Going Out program of the Elementary-level class, in which children venture out of the classroom to conduct research for reports on topics they find interesting and then often present the report to the class.

Dr. Montessori’s overarching educational plan for the second plane is called *cosmic education*. Cosmic education allows for the use of the imagination and abstraction, with stories and experiments as the new tools for learning. Cosmic education is suited to this second plane because children of this age seek to understand their place in the universe and begin to think about justice as “the great problem of Good and Evil now confronts [them]” (Montessori, 1948/1976, p. 12).

**The third plane.** Dr. Montessori noted that 12 to 18 years of age is a period of great transformation, both physical and mental. As in the first plane, she saw the first half of the stage as a time of extreme change and the second half as a period of consolidation (Montessori, 1967/1995, Chapter 3). During the third plane, immense physical growth takes place. Psychologically, the adolescent experiences “doubts and hesitations, violent emotions, discouragement and an unexpected decrease of intellectual capacity” (Montessori, 1948/1976, p. 101). Children are preparing for their adult roles in society and need to practice adulthood in a physically and emotionally safe place. Country life—being close to nature and independent of the family—is suitable for this stage of development (Montessori, 1948/1976). Real work is essential, entailing gross motor activity and practical skills. For example, children in the third plane might apprentice with a craftsperson or run a small business on a farm. Being in a society of their peers is crucial. Academic studies continue but with a connection to self-generated, useful occupations. Creative expression, scientific skills, and an understanding of the world that the adolescents will soon enter as adults are important components of Montessori programs aimed at this age level.

In sum, Dr. Montessori saw in each developmental period distinct psychological characteristics that the Montessori education system responds to. She also saw certain tendencies that were characteristic of all people at all stages of development; these are discussed next.

### **The Human Tendencies**

A central tenet of Montessori theory is that, throughout life, all humans exhibit certain tendencies on which education can capitalize. Dr. Montessori spoke of these tendencies repeatedly (indeed, they appear in her quotations throughout this article), and they were formalized by her grandson Mario:

*The child possesses [certain human tendencies,] potentiality at birth, and makes use of them to build an individual suited to his time.... It is logical that if one can discover both tendencies and sensitive periods, and one is able to [support] them, [one] will have found a secure and permanent foundation on which to base education if education is viewed as a help to fulfill the optimum potential of the child.* (M. M. Montessori, 1956, p. 23)

In Montessori theory, humans, like many animals, tend to explore their environments and to find their place (i.e., orient) in the environment, both physically and socially. Montessori education gives children organized environments in which to respond to these tendencies and to explore and orient themselves. Children also have natural tendencies to be active and to engage in work. This work often takes the form of manipulating objects with the hands, another human tendency. Humans also respond well to order and seek to put things in order, to classify and categorize. In all of this, children are driven toward precision and self-perfection, both of which are accomplished through repetition. Finally, humans also have tendencies to abstract rules from sets of phenomena and to communicate what they think and feel to others.

These tendencies account for human survival, leading humans to seek from the environment what they need for their development, whether it be food or shelter, or practice walking or writing. Montessori environments respond to these tendencies, enabling children to discover the world for themselves, much as all humans have done since the dawn of our species. Authentic Montessori classrooms are set up to respond to these tendencies across all stages of development. What we believe is unique in Dr. Montessori's theory is not noting these tendencies, which are repeatedly observed in science; what is unique is that she developed an educational system to respond to these tendencies. When children spend time in this educational system, Dr. Montessori observed, certain characteristics become manifest. These observed child outcomes are discussed next.

### **Child Outcomes**

Dr. Montessori frequently described what children become after developing in the environments she created with teachers who implemented the system properly. She described students in Montessori classrooms as “equipped in their whole being for the adventure of life, accustomed to the free exercise of will and judgment, illuminated by imagination and enthusiasm” (Montessori, 1948/1967, p. 1). To be “equipped in their whole being for the adventure of life” is difficult to address empirically, but we do know that Montessori children have free choice all day long and that the materials they use require them to repeatedly make judgments. Clearly, then, Montessori students are accustomed to the free exercise of will and judgment. Some studies indicate that Montessori children are especially creative (Besançon & Lubart, 2008; Besançon, Lubart, & Barbot, 2013; Lillard & Else-Quest, 2006), although not in drawing when compared to children in Steiner schools, which emphasize art (Cox & Rowlands, 2000; Kirkham & Kidd, 2017; Rose, Jolley, & Charman, 2012).

Dr. Montessori also described Montessori children as active and their activity as leading to joy and equanimity: “Left to themselves, the children work ceaselessly... The children find joy, satisfaction, and exhilaration in work... Work then becomes the *sine qua non* of growth, development, efficiency and happiness” (Montessori, 1961/2007, p. 87). A Montessori classroom, she said, hums like a hive of busy bees (Montessori, 1994a, p. 83) as the children go about their work, independently, calmly, and happily (Montessori, 2012, p. 156). Research on the social characteristics of Montessori children, although not always aligning with these descriptions, is generally consistent. A study of middle school students at Montessori schools, for example, found that, compared to their peers at traditional schools matched for socioeconomic status and ethnicity, Montessori children felt more of what Csikszentmihalyi called “flow”—energized, involved, happy, fulfilled—during schoolwork but not in other activities (Rathunde & Csikszentmihalyi, 2005a), and children do move more in Montessori environments than in conventional environments (Byun, Blair, & Pate, 2013). Lillard, Heise, Tong, Hart, and Bray (2017) found relatively more positive feelings about school in Montessori students than in controls, and some new unpublished data from Lillard's laboratory indicate that adults who went to Montessori schools as children reported skipping school less frequently than did students who went to other types of schools, another indicator that they may have enjoyed school more.

Children in authentic Montessori classrooms, as described by Dr. Montessori, showed remarkable concentration on their work.

*In thousands of schools in every part of the world...little children have demonstrated the capacity of working for long periods of time without tiring, of concentrating in a manner completely remote from the outside world, thus revealing the constructive process of their personalities.* (Montessori, 1956, pp. 158–159)

Similarly, several studies have reported higher executive function in Montessori children (Culclasure, Fleming, Riga, & Sprogis, 2018; Kayılı, 2018; Lillard, 2012; Lillard & Else-Quest, 2006; Phillips-Silver & Daza, 2018) and even in conventionally schooled children who simply used some Montessori materials outside of the classroom (Yildirm Doguru, 2015). Thus, results from research may support Dr. Montessori's description of children in authentic Montessori classrooms concentrating unusually deeply on work they chose and seeming to find joy in their work.

Dr. Montessori believed that because the classrooms allow free interaction with a wide range of classmates, children learn to participate effectively in a heterogeneous social group: "The idea of respecting others, and of waiting one's turn, becomes a habitual part of life which always grows more mature" (Montessori, 1967/1995, p. 224). Dr. Montessori remarked on the kindness of children in classrooms using her system; for example, when someone has an accident (e.g., accidentally breaks a vase), "they all run to help..., encouraging and comforting them" (Montessori, 1967/1995, p. 240). Consistent with these observations, Montessori middle schoolers were more likely to consider their classmates to be friends, and on measures of teacher support and fairness and of classroom order and safety, Montessori middle schoolers reported a better social environment than did matched controls (Rathunde & Csikszentmihalyi, 2005b). Compared to lottery-waitlisted controls, Montessori children showed better social problem-solving skills and (as stated earlier) more positive behavior on the playground (Lillard & Else-Quest, 2006), better theory of mind, and more positive feelings about school (Lillard et al., 2017). A recent longitudinal study of children in a Turkish Montessori school also showed greater growth across the school year in social competence and emotion regulation than was seen in demographically similar children in a non-Montessori school (İman, Danişman, Akin Demircan, & Yaya, 2017).

In sum, Dr. Montessori believed that authentic Montessori education engenders certain behavioral and social characteristics in children, and research today tends to support her view. The children appear to enjoy work, they concentrate for long periods on their schoolwork, and they are excited by their learning engagements. In addition, they show empathy and respect for their classmates. These characteristics emerge across the developmental planes in the Montessori system, which supports certain human tendencies and allows children to engage in their own self-construction.

### Summary and Conclusion

Montessori education is composed of a trinity: the child, the teacher, and the prepared environment. A trained teacher who executes the system as directed, preparing the environment and setting children free, should theoretically observe the outcomes described in the last section. These outcomes are surmised to result in response to a system that meets children's needs at each stage of development, including their overarching human tendencies. The Montessori system involves a grand vision and a unique view of the child and the purpose of education.

Dr. Montessori adjusted the system in response to children throughout her life, but even before her death in 1952, others had begun to implement it differently. Today, *Montessori* is used to describe what happens inside a wide variety of classrooms, and implementation quality differs widely (Debs, 2019). Montessori education evokes strong reactions, both positive and negative. Perhaps this is because when Montessori education is implemented to fidelity, what people see in a classroom looks good, thereby prompting admiration. When it is implemented poorly, people see a classroom that does not function well, and they shun Montessori education rather than understand that the classroom they saw did not implement it properly (Lillard,

2019). Throughout Dr. Montessori's books, one can read clear descriptions of what she considered important aspects of the educational system she developed. Although she surely would have continued to develop that system, we cannot know how. Montessori teacher-preparation organizations and individual schools and teachers have all made changes, adapting the system to a more globalized world, different languages, state and school regulations, and other cultural circumstances that Dr. Montessori had not encountered.

As researchers increasingly study Montessori education, it is useful to understand how individual schools or sets of schools implement the Montessori system relative to some benchmark. It also seems useful for administrators, teachers, and parents to have a description from which to measure variations. Therefore, here we have attempted to describe such a benchmark by synthesizing across Dr. Montessori's books some key features of authentic Montessori education, in the sense of "done in the original way" (*Oxford English Dictionary*, 2019). A summary of the characteristics we discussed is provided in the appendix. Again, we do not claim that the implementation described is necessarily optimal; as noted, throughout her years of work, Dr. Montessori tweaked her system and no doubt would have adjusted it further. By designating what is authentic, people studying Montessori education can include in their analyses school variables (e.g., class size, length of work period) that differ from this authentic implementation and thereby perhaps shed light on what improves the system and what does not. Much more empirical research is needed on the outcomes of this very different but promising educational system.

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## References

- Authentic. (2019). *Oxford English dictionary*. Retrieved from <https://en.oxforddictionaries.com/definition/authentic>.
- Besaçon, M., & Lubart, T. (2008). Differences in the development of creative competencies in children schooled in diverse learning environments. *Learning and Individual Differences, 18*, 381–389. doi:10.1016/j.lindif.2007.11.009
- Besaçon, M., Lubart, T., & Barbot, B. (2013). Creative giftedness and educational opportunities. *Educational and Child Psychology, 30*, 79–88.
- Byun, W., Blair, S. N., & Pate, R. R. (2013). Objectively measured sedentary behavior in preschool children: Comparison between Montessori and traditional preschools. *International Journal of Behavioral Nutrition and Physical Activity, 10*(2). doi:10.1186/1479-5868-10-2
- Chomsky, N. (1993). On the nature, use, and acquisition of language. In A. I. Goldman (Ed.), *Readings in philosophy and cognitive science* (pp. 511–534). Cambridge, MA: The MIT Press.
- Cox, M. V., & Rowlands, A. (2000). The effect of three different educational approaches on children's drawing ability: Steiner, Montessori and traditional. *British Journal of Educational Psychology, 70*, 485–503.
- Culclasure, B., Fleming, D. J., Riga, G., & Sprogis, A. (2018). *An evaluation of Montessori education in South Carolina's public schools*. The Riley Institute at Furman University. Greenville, SC.

- Debs, M. C. (2019). *Diverse parents, desirable schools: Public Montessori in an era of school choice*. Cambridge, MA: Harvard Education Press.
- Harris, P. L. (2012). *Trusting what you're told: How children learn from others*. Cambridge, MA: Harvard University Press.
- İman, E. D., Danişman, Ş., Akin Demircan, Z., & Yaya, D. (2017). The effect of the Montessori education method on pre-school children's social competence-behaviour and emotion regulation skills. *Early Child Development and Care*, 1–15. doi:10.1080/03004430.2017.1392943
- Karpicke, J. D., & Roediger, H. L. (2008). The critical importance of retrieval for learning. *Science*, 319, 966–968. doi:10.1126/science.1152408
- Kayılı, G. (2018). The effect of Montessori Method on cognitive tempo of kindergarten children. *Early Child Development and Care*, 188, 327–355. doi:10.1080/03004430.2016.1217849
- Kidd, C., Piantadosi, S. T., & Aslin, R. N. (2012). The Goldilocks effect: Human infants allocate attention to visual sequences that are neither too simple nor too complex. *PLoS ONE*, 7, e36399. doi:10.1371/journal.pone.0036399
- Kidd, C., Piantadosi, S. T., & Aslin, R. N. (2014). The Goldilocks effect in infant auditory attention. *Child Development*, 85, 1795–1804.
- Kirkham, J. A., & Kidd, E. (2017). The effect of Steiner, Montessori, and national curriculum education upon children's pretence and creativity. *The Journal of Creative Behavior*, 51, 20–34. doi:10.1002/jocb.83
- Kubovy, M. (1999). Pleasures of the mind. In D. Kahneman, E. Diener & N. Schwartz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 134–154). New York, NY: Russell Sage Foundation.
- Lewkowicz, D. J., & Hansen-Tift, A. M. (2012). Infants deploy selective attention to the mouth of a talking face when learning speech. *Proceedings of the National Academy of Sciences*, 109, 1431–1436.
- Lillard, A. S. (2012). Preschool children's development in classic Montessori, supplemented Montessori, and conventional programs. *Journal of School Psychology*, 50, 379–401. doi:10.1016/j.jsp.2012.01.001
- Lillard, A. S. (2017). *Montessori: The science behind the genius* (3rd ed.). New York, NY: Oxford University Press.
- Lillard, A. S. (2019). Shunned and admired: Montessori, self-determination, and a case for radical school reform. *Educational Psychology Review*. doi:10.1007/s10648-019-09483-3
- Lillard, A. S., & Else-Quest, N. (2006). Evaluating Montessori education. *Science*, 313, 1893–1894. doi:10.1126/science.1132362
- Lillard, A. S., Heise, M. J., Richey, E. M., Tong, X., Hart, A., & Bray, P. M. (2017). Montessori preschool elevates and equalizes child outcomes: A longitudinal study. *Frontiers in Psychology*, 8. doi:10.3389/fpsyg.2017.01783
- Montessori, M. (1917/1965). *Spontaneous activity in education: The advanced Montessori Method* (F. Simmonds, Trans.). New York, NY: Schocken.
- Montessori, M. (1932/1992). *Education and peace*. Oxford, England: Clio Press.
- Montessori, M. (1936). *The secret of childhood* (B. B. Carter, Trans.). Bombay, India: Orient Longmans.
- Montessori, M. (1939). *The secret of childhood* (B. B. Carter, Trans.). New York, NY: Frederick A. Stokes.
- Montessori, M. (1946/1963). *Education for a new world*. Madras, India: Kalakshetra.
- Montessori, M. (1948). *Training course in the Montessori Method of education: Edinburgh*. Retrieved from the archives of the Association Montessori Internationale.
- Montessori, M. (1948/1967). *To educate the human potential*. Madras, India: Kalakshetra Publications.

- Montessori, M. (1948/1976). *From childhood to adolescence*. New York, NY: Schocken.
- Montessori, M. (1949/1974). *Childhood education*. Chicago, IL: Henry Regnery.
- Montessori, M. (1956). *The child in the family* (N. R. Cirillo, Trans.). New York, NY: Avon.
- Montessori, M. (1961/2007). *What you should know about your child* (A. G. Prakasam, Trans.). Amsterdam, the Netherlands: Montessori-Pierson.
- Montessori, M. (1962/1967). *The discovery of the child* (M. J. Costello, Trans.). New York, NY: Ballantine.
- Montessori, M. (1967/1995). *The absorbent mind* (C. A. Claremont, Trans.). New York, NY: Henry Holt.
- Montessori, M. (1989). *The child, society, and the world: Unpublished speeches and writings* (Vol. 7). Oxford, England: Clío.
- Montessori, M. (1994a). *Creative development in the child* (Vol. 1; R. Ramachandran, Trans.). Madras, India: Kalakshetra Press.
- Montessori, M. (1994b). *Creative development in the child* (Vol. 2; R. Ramachandran, Trans.). Madras, India: Kalakshetra Press.
- Montessori, M. (2012). *The 1946 London lectures*. Amsterdam, the Netherlands: Montessori-Pierson Publishing.
- Montessori, M. (2013). *The 1913 Rome lectures*. Amsterdam, the Netherlands: Montessori-Pierson Publishing.
- Montessori, M. (2017). *Montessori speaks to parents*. Amsterdam, the Netherlands: Montessori-Pierson Publishing.
- Montessori, M. M. (1956). *The human tendencies and Montessori education*. Amsterdam, the Netherlands: Association Montessori Internationale.
- Mueller, P. A., & Oppenheimer, D. M. (2014). The pen is mightier than the keyboard: Advantages of long-hand over laptop note taking. *Psychological Science, 25*, 1159–1168. doi:10.1177/0956797614524581
- Phillips-Silver, J., & Daza, M. T. (2018). Cognitive control at age 3: Evaluating executive functions in an equitable Montessori preschool. *Frontiers in Education, 3*. doi:10.3389/educ.2018.00106
- Rathunde, K. R., & Csikszentmihalyi, M. (2005a). Middle school students' motivation and quality of experience: A comparison of Montessori and traditional school environments. *American Journal of Education, 111*, 341–371.
- Rathunde, K. R., & Csikszentmihalyi, M. (2005b). The social context of middle school: Teachers, friends, and activities in Montessori and traditional school environments. *Elementary School Journal, 106*, 59–79.
- Resnick, L. B., & Hall, M. W. (1998). Learning organizations for sustainable education reform. *Daedalus, 127*, 89–118.
- Rose, S. E., Jolley, R. P., & Charman, A. (2012). An investigation of the expressive and representational drawing development in national curriculum, Steiner, and Montessori schools. *Psychology of Aesthetics, Creativity, and the Arts, 6*, 83–95. doi:10.1037/a0024460
- Standing, E. M. (1957). *Maria Montessori: Her life and work*. London, England: Hollis & Carter.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Yildirm Doguru, S. S. (2015). Efficacy of Montessori education in attention gathering skill of children. *Educational Research and Reviews, 10*, 733–738.

## Appendix

### Authentic Montessori Elements

This list extracts elements mentioned in Part I (The Environment) and Part II (The Teacher and the Child) of *Authentic Montessori: The Dottoressa's View at the End of Her Life*. It is provided to facilitate detection of variations across Montessori implementations. Elements are listed in the order in which they are discussed in the articles.

#### Elements of the Environment

##### *Physical Space and Contents*

- Prepared
  - Class space and contents are beautiful, inviting, systematically and logically organized (all math together, all language together, etc.)
  - Suited to the child (light furniture children can carry; objects in reach; objects are child sized and usable by children; includes some fragile, breakable objects)
  - Full set of Montessori materials for age group
- Practical Life work is practical; it has a useful aim and is something children see adults do in their culture for real, practical purposes
- Includes no extraneous materials (i.e., materials not described in Montessori's books/lectures, except for culture-specific practical life)
- Only one copy of each material
- Access to nature
- Access to other classrooms

##### *Temporal*

- Uninterrupted, long (at least 3 hours in the morning and 2 to 3 hours in the afternoon) work periods every day
- Consistent schedule

##### *Social*

- Three-year groupings
- Specific age groupings corresponding to developmental periods: 0–3, 3–6, 6–9, 9–12, 12–15
- 25 or more children in a class
- One teacher, possibly one assistant
- Visitors sit quietly and do not interfere
- The class belongs to the children

#### Elements of the Teacher

- Attractively dressed
- Inviting and calm manner and voice
- Presents material as very special, wonderful
- Has prepared the environment
- Has undergone rigorous training with personal transformation
- Interferes only when needed
- Observes a great deal
- Shows humility and great respect for children
- Appears aware of entire classroom
- Shows warmth and understanding
- Shows authority

### **Child Outcomes**

- Freely exercise will and judgment
- Enthusiastic
- Imaginative
- Creative
- Like a hive of busy bees
- Show joy, satisfaction, exhilaration in work
- Work independently
- Work calmly
- Work energetically for long period
- Show respect for others
- Wait their turn
- Show empathy (e.g., when others are hurt or break something)