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Parenting for a New World

Neuropsychology and Montessori

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Montessori education is a brain-based, developmental method that allows children to make creative choices in discovering people, places, and knowledge of the world. It is hands-on learning, self-expression, and collaborative play in a beautifully crafted environment of respect, peace, and joy. It is also about brain development. A skillful Montessori teacher knows what stage a child is at in their brain development and they are meeting it, and they are feeding it. The Montessori method is like education designed by a pediatric developmental neuropsychologist.

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Montessori education is the original, and, I think, the best brain-based model of education. The body is rather interestingly mapped along the surface of the brain. It is not mapped on the brain in any way that matches the size of the area. It is not a one-to-one mapping. If you were to build a human based on what the brain thinks a human looks like, the most striking feature would be the unusually large hands.

Why do young children, who are still developing the ability to understand language, spend so much time sitting and listening to teachers at a conventional school? Wouldn't it be nice to design an educational model around hands-on activity, physical manipulation, and engagement in the world? Maria Montessori did just that.

There is a model of the way the brain is organized and how it works which I refer to as the nuggets and networks system. Areas of the brain do not function in isolation; they communicate with other areas through networks of active fibers. Brains need healthy nuggets and healthy networks in order to function.

Nuggets can be defined as small, circumscribed areas of the brain that perform a specialized function. A good example of a specialized function is reading. Reading is a cognitive function that requires the coordinated use of more than one nugget. Reading does not happen in one spot in the brain; it's the coordination of multiple spots that cover things like letter and word recognition, phonological processing, and language comprehension. Somehow, Maria Montessori knew about these nuggets. The Montessori reading curriculum is astonishingly dead-on in helping developing brains condense the nuggets that perform these certain functions.

In the brain of a child with a learning disability, there is a nugget that is not formed. That nugget is necessary for a critical component of reading. If we can identify that a child has a nugget that is not firing correctly, or at all, we can help that nugget form. One of the ways you do that is through a series of very circumscribed, specific, and repetitive tasks that are about training that little undeveloped nugget. You can actually do some significant remediation using that method.

Networks are the fibers underlying the surface of your brain, or your cortex. When you are confronted with a novel task, your brain needs help. Your brain then calls on all quarters to solve the problem. A healthy and well-developed network system helps bring all hands, or all neurons, on deck. There is a lot of general processing happening everywhere in a novel problem-solving brain.

In a Montessori classroom, a child will learn how to grip an object using the Bailey's two-point pencil grasp through doing cylinder work: the little handles attached to the cylinders require that sort of handling. When the child then moves on to writing, they know how to hold a pencil as a result of all the time they spent handling the cylinders. This is an example of how the networks in your brain function. The novel task of holding a pencil is supported by previous activities.

There are some things we know of that can help brains develop healthy and strong nuggets and networks. Repetition helps build better brains. Repetition is a big part of the Montessori environment.

Take, for example, the pink tower. The child's motor system is developing so that he or she can hold the top pieces of the tower high and still enough to place them on top of each other. It feels good to develop this mastery. We can also build better brains by providing our children with settings in which they feel secure. A child can sit in a quiet, beautiful spot in the classroom and look at a book in peace. Or, they can take care of plants. They have the freedom to check to see if the plants need watering and the knowledge of how to care for another living thing.

Hands-on work can also enhance learning. There is research that directly compares the effects of observational vs. hands-on learning. You will not be surprised to hear that hands-on matters. In a Montessori classroom, children learn that tasks have a beginning part, a doing part, and a completion part. All of these practices of life activities are supporting the development of networks that will be utilized in practical daily tasks.

We know we can also build better brains through multi-sensory activities or through sensory specific activities. Maria Montessori observed that children are drawn to balancing on railings or tightrope walking on lines. She noticed that children are drawn to these sorts of things, so she understood there must be a sort of developmental need for them.

Maria Montessori wrote late in her career about characteristics that emerged everywhere in the world of children that came out of these Montessori environments. They had a love of order, of work, of silence, and of being alone. They had profound concentration abilities. They demonstrated appropriate obedience, not obsequiousness. They showed independence and initiative, and they had spontaneous self-discipline. They were well-attached to reality, and they were joyful.

I think we are starting to realize, at national and international organizational levels, that we need to analyze and harness the forces that control what happens in schools, and we need to work to change society for the benefit of children.

In fall 2006, Angeline Lillard published a study in *Science*, one of the most prestigious journals in the world, which examined academic, social, and intellectual outcomes of children who were educated in a Montessori environment. She used a student sample from Milwaukee, where there is fantastic public Montessori involvement. Many people want to send their children to Milwaukee's Craig Montessori School. You have to enter a lottery to be accepted. Lillard was able to compare the children who won the lottery and went to the Montessori school with the children who applied but did not win the lottery, and ended up at other schools. This provided Lillard with a largely urban, lower-income, diverse study sample. It also gave her random assignment participants.

In her study, Lillard found that Montessori children demonstrated significantly stronger social cognition skills. They performed better in academics and were better able to put themselves into the shoes of somebody else in the understanding of what had gone on in a situation.

The general summary from Lillard's work is that in a real-world, public, inner-city Montessori school with an excellent implementation of the Montessori model, there were differences favoring the Montessori kids in executive functioning, decoding and early math, understanding of the mind, and appeals to social justice and social behavior by the end of kindergarten. Those advantages were present early on, and remained at grade 6.

People do not doubt that the Montessori method works for children of privilege. They are delighted to hear it also works in inner-city public school systems, because the majority of children go to conventional public schools. There is no reason that schools in our culture have to be the way they are. It is about industrialization. It is about tradition. It is about inertia. Nobody who is a developmental psychologist, nobody who is a neuropsychologist, would design a school today that would look like a conventional school. School structure is just habit.

At this point, in the history of the world, in the history of our civilization, what happens next will depend on how the earth and its inhabitants are regarded by those who stand to inherit it. I believe that if our children and grandchildren are to see the 22nd century, those who are running things now need the 21st century to value a civilization that holds peace and kindness, and justice and respect for the needs and welfare of others as core values. These values lay at the heart of Montessori education, and I believe these values will support the value of our planet and our species.

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