



Julia Volkman

The neurobiology of why we wait

Processing time...the need to filter through all that has happened and make sense of it. If we're lucky, we're able to work time into our days for this by exercising, walking outdoors, or meditating. When our weekdays are too busy, the weekends often get overwhelmed with the brain's inability to go without a break and so...we crash!

We're not just being selfish in seeking down time. We're being driven to do so by our brain. We spend a great deal of our time "on task" but that is only half of our cerebral picture. Have you ever wondered what happens in your brain when you pause, daydream, zone out, or self reflect? Well it doesn't shut off! Instead, an entirely distinct network of brain areas becomes active. In neuroscience, they call this the "default mode network" because it's what we default to when we're not doing something else. The default mode is mostly in the middle of the brain and when it's active, our attention is focused inward. When our attention is focused outward, other parts of the brain are active and the default mode areas toggle off. Get it? If we're focused outward, there's not much default mode activity. If we're focused inward, we have lots of default mode activity.

The funny thing is that if we want to be able to have excellent focus and attention on outward things, we have to develop our full potential for focusing inward. The systems need to be balanced to be most efficient. Some research has shown that adults with higher IQs have higher default mode network connectivity. To reach our full potential, we need to put our attention on both what's happening out there and on what's happening in here.

But, I ask you, in this culture, are we allowing children to develop their ability to focus inward? Do we offer them down time throughout the day? Is my 17 year-old right to call herself a "screenager?" How much time do we give children for quiet reflection and offline processing? Cognitive neuroscientists are afraid it's not enough. In fact, ADHD, anxiety disorders, depression, and even schizophrenia are all associated with atypicalities in default mode functioning. I find that frightening and entirely believable; debilitating conditions that could be helped by simply taking the pressure off.

So let's think about how this plays out in our classrooms. How do we respond when we see a child wandering? Do we step in if a child looks like she's zoning out? Do we wait for the child to see his own errors or do we correct when he seems to pause too long? What is too long?

[The children's] mysterious potentialities ought not to be either dissected or crushed out by us; we must wait for the succession of events in which they show themselves.

Discovery of the Child Maria Montessori

Again and again throughout the day we see the children make "errors" as they work with the materials. The binomial cube is put together on its side and the box won't close. The glass is about to spill. The word is being written backwards. With many of the materials, it is easier for us to have the patience to wait for the material to self correct, the cylinder blocks being a prime example. But with many others, like if the child places a card upside down, we just can't wait. We jump in to correct. Now, for many materials we ARE the control of error and so it is our job to step in. But, I ask you, are we stepping in too soon? What happens if we wait just a little bit longer and find another way to draw the child's

attention to the accuracy of the work (if it is not inherently done so in the materials themselves)? Or what if we just observe and realize we need to revisit the preparatory work for that lesson?

"Wait while observing." That is the motto for the educator. Let us wait and be always ready to share in both the joys and the difficulties which the child experiences. He himself invites our sympathy, and we should respond fully and gladly. Let us have endless patience with his slow progress, and show enthusiasm and gladness at his success.... What we all desire for ourselves, namely, not to be disturbed in our work, not to find hindrances to our efforts, to have good friends ready to help us in times of need, to see them rejoice with us, to be on terms of equality with them, to be able to confide and trust in them—this is what we need for happy companionship. In the same way children are human beings to whom respect is due, superior to us by reason of their 'innocence' and of the greater possibilities of their future. What we desire they desire also.

Dr. Montessori's Own Handbook Maria Montessori

Ah yes. It's about happiness and respect. Don't you love that all that high tech brain research comes back to this?

The other day when I was doing some 3-part card work with a child, I saw him put two of the control cards upside-down next to the picture and word label. He had put them down mechanically and then said, "They're all right." I asked, "Oh, how do you know?" That drew his attention to the word and control card. He began to check each word, not just mechanically but intellectually. And lo and behold, he found the upside-down cards and fixed the errors on his own. I am utterly embarrassed to confess to you how many times I have intervened with other children before this had a chance to occur. What was I doing to their default mode network? I moved their attention from an internal, self-referential focus to an external one. I didn't give them processing time to truly "discover" the error. Instead, I pointed out and drew attention to the error. How humbling!

So if I sink back into the deeper Montessori teachings, I see that we all do this all year long whenever we forge ahead onto the next presentation before the child is necessarily ready. We all want to cut to the chase and see that stamp game in action so those little slips can go home to the parents and the parental confidence can arrive! But every time we dive blindly ahead, like by presenting the cylinder blocks during the first days of school or skipping the tens boards and going straight to the 10 chain, we take away a chance for the child to develop his powers of internal reflection. This is a more global perspective on waiting, on patience, on developing the infrastructure that supports the default mode network.

It is useless and harmful to give the children sensorial and cultural apparatus before they are ready to benefit from it. Before introducing this kind of material, one must wait till the children have acquired the power to concentrate on something, and usually, as I say, this occurs with the exercises of practical life. When the child begins to show interest in one of these, the teacher must not interrupt, because this interest corresponds with natural laws and opens up a whole cycle of new activities. But the first step is so fragile, so delicate, that a touch can make it vanish again, like a soap bubble, and with it goes all the beauty of that moment. The teacher, now, must be

The Trouble with Sponge Bob

Remember when IQ was the thing people talked about? If you had a high IQ, that meant a lot about your potential, right? But now, with a greater understanding of multiple intelligences, IQ on its own has kind of lost its appeal. Today we're more interested in our decision making ability. How well can we pay attention, plan, remember things, appropriately express/inhibit emotion, and think outside the box? These are our Executive Functions (EF) and they are expected to be the characteristics that matter most to our success as adults in contemporary society. (You can read more about EF in the Fall 2010 issue of this newspaper.)

So, doing things that help children develop their EF skills is generally thought to be good and things that get in the way of EF are bad. Well, Angeline Lillard, our heroic Montessori researcher and professor at the University of Virginia, has come to the rescue again. This time, the focus is on something we Montessorians hold near and

dear to our hearts—to much television.

Professor Lillard led a study of 60 children who were given four short tests that evaluate EF abilities. The children didn't just show up and take the tests, first they had nine minutes of either drawing, watching a face-paced show like Sponge Bob, or watching an educational show like Caillou. After the nine minutes, they took the tests.

So, just guess...what do you think she found? BINGO! The children who watched the fast-paced TV show scored significantly lower on the EF tests. The highest scorers were the children who drew. So, after just 9 minutes of rapid fire kids TV, Executive Function was impaired. How much of those shows do your students watch each day? More than nine minutes?

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most careful. Not to interfere means not to interfere in any way. This is the moment at which the teacher most often goes wrong.

The Absorbent Mind Maria Montessori

Now how exactly did Maria Montessori know all this about those natural laws? I mean, modern scientists need these million dollar magnets to figure it out! But, essentially, today's scientists and Montessori do the same thing: scientific observation. Whether the tool is our eyes or an fMRI machine, the result is objective data. Just facts. Just the truth.

So, all the more reason to make sure we allow ourselves processing time. If our default mode is functioning optimally, we'll notice all those tiny things that give us insight on how to guide the child. We can train ourselves to pause before we intervene. Each time we're ready to jump in we can notice that we're about to jump in and just wait two more breaths. Then, maybe it will extend to three or four more breaths. Slowly, by noticing and by making effort, we can develop our own ability to focus internally, to understand what we see before us without simply reacting to what we see. We can set aside our own "need" for the children to be advancing at the proper pace and allow them to move at their pace.

This is compassion. This is wisdom. This is genuine kindness.

And by kindness is not meant caresses. Should we not call anyone who embraced us at the first time of meeting rude, vulgar, and ill-bred? Kindness consists in interpreting the wishes of others, in conforming one's self to them, and sacrificing, if need be, one's own desire. This is the kindness which we must show towards children.

Dr. Montessori's Own Handbook Maria Montessori

Julia Volkman is the mother of a teenager and a 6-year-old, a Montessori Mentor at public and private Montessori Schools, a master's candidate in psychology at Harvard University, a former Advisory Panel Member for the Annenberg Foundation's Neuroscience in the Classroom course (www.learner.org/courses/neuroscience), and the founder of Maitri Learning (www.maitrilearning.com). She will be speaking about her work this spring in a special section of the Harvard University Extension School course, Mind, Brain, Health, and Education and as keynote speaker at the Maine Montessori Association conference.