

## **Montessori Primes Executive Functions** **By Julia Volkman**

One day he knows it, the next day he doesn't. When things change, he has difficulty adapting. Her belongings are a disheveled disaster! He can't seem to finish anything. These statements can all be looked at in terms of the brain's executive functions (EFs), about which there is a fair amount of buzz in research circles these days.

In a nutshell, our executive functions help us organize and self-regulate all aspects of our humanity. When EF is compromised, we experience a spectrum of symptoms from mild confusion to persistent learning disabilities to dementia (as seen in Alzheimer's disease). Internal organization & self-regulation—pretty much the main outcomes of the first plane of development, don't you think?

Let's look at this more closely. EFs include (Davidson, 2006, Stanberry, 2010):

- Cognitive flexibility (being able to adapt as situations change)
- Attention, planning, & focus (intentionally working on a task and seeing it through)
- Recall & working memory (the ability to hold something in mind and work with it)
- Emotion & inhibition (being able to choose appropriate while inhibiting inappropriate or irrelevant possible responses via self-regulation)

Some of these develop early in childhood but most are not fully refined until early adulthood. The good news is that when we do our jobs well, the Montessori pedagogy innately and intuitively aids the child in strengthening EFs. Here are some of the key ways.

### **Cognitive Flexibility**

Cognitive flexibility means one can adapt or adjust one's thinking to meet the changing needs of a situation. Of course Montessorians know that adaptation is innate in humans and particularly pronounced in the first plane of development. Children shift their behaviors constantly so that they can fit into their social group, place, and era. Cognitive flexibility, however, is more about seeing that there is more than one possible solution to a problem or more than one possible appropriate response. So if John puts his hat on before his coat, this is not a problem even if we always demonstrate putting the coat on first. It still works. There is no need for correction. And how does that develop? I believe it is rooted in trust.

Consider this example. You are in a meeting with several teachers/administrators. You have different levels of respect for each person in the room. Some you hold with less esteem than others but something in you believes that discussing a challenge with this group is going to help produce an effective answer. Maybe not immediately. Maybe not without challenges. But, there is wisdom in the room. Given the right causes and conditions, that wisdom will present itself as a workable solution.

Now, consider young children with EF difficulties. These children, just like those without EF challenges, are adapting to the feedback they receive from their environment. They are

constantly making errors of organization and self-regulation. They often receive harsh social feedback and, in turn, they learn to give out harsh social feedback. They often are criticized for their mistakes and they, in turn, learn to criticize others for their mistakes. Their attention is regularly drawn to the ways in which they “fail” and they, thus, learn to focus on failings. It is easy to see how a child in this situation would not trust himself let alone those around him. So our main task is to help these children return to their original state of optimism and trust in their own abilities.

We must develop their self confidence by allowing them to see that they can succeed—that they are capable. We must be thorough, explicit, and exhaustive in our grace & courtesy presentations. We must break tasks down to preliminary exercises. We must focus on the positive and draw attention to success, beauty, and resourcefulness. And we must target the times of day when these challenges often assert themselves: during transitions.

For example, five to ten minutes before the end of the work period, use a physical, non-verbal cue to indicate the change is about to come. You may turn on classical music or change the lighting in a specific way. Also, allow more time than you expect you’ll need for transitions (especially when dressing for the outdoors) and have your assistant available so children who finish early do not have to wait for those who need more time. Give explicit grace and courtesy lessons on each aspect of making the transition. Break these down just as you would preliminary exercises for table scrubbing and model your thinking aloud. For example, “The classical music is on, that means we’re going outside!” Look out the window. “It is snowy outside.” Look at your body. “I will be cold and wet if I go out like this. I need snow clothes.” Continue for the process of going to the child’s cubby, noticing what is there, etc. And then do this exact same process, role model it in close proximity to the child, again and again and again until the child doesn’t need it anymore.

By giving our attention to the structure of transition times, we can protect the child from any more damage to his self-esteem. We must vigilantly protect his developing self-confidence...it is so fragile.

### **Attention, Planning, & Focus**

We trust the child’s inner guide to direct him to the activities he needs for optimal development. But when children are struggling in certain areas, they often become resistant to the work they most need and seem unable to complete it. How do we address this? Well, there are all kinds of strategies we employ. We are most familiar with the external strategies like work lists and check lists and lots of adult supervision and follow-up. The theory is that the child will ultimately internalize or “own” these approaches because they have been effectively and consistently modeled for some time. However, research shows that these strategies do not translate from one situation to another (Council for Exception Children, 2010). These external methods can be effective in the short-term in a child who has reached the third level of discipline but they are external. We, of course, are seeking internal, lasting transformation.

*Desire and Confidence:* For the internal change, and for the child who is not yet at the third level of discipline, we have to call to the child’s internal drives. The change must arise from the child himself. For example, how do we get the child who won’t wear a blindfold to develop their

stereognostic sense (so important for the visual-spatial challenges intertwined with EF challenges)? We adapt. Try offering an eye-patch as an alternative to the blindfold. Model keeping your eyes closed instead of using the blindfold (and don't worry if the child peeks at first). Make sure the textures of the materials are those the child is drawn to (not disturbing to his tactile sense). Once you've adapted the materials to meet the child where he is, then you must make the activities he needs as tantalizing as frozen lemonade in July. The child may need more scaffolding (support from you or another child) before feeling capable of independent work. He may need to sit with you while you watch other children enjoy the work. He may need a joyful presentation that finds renewed magic in the work morning after morning after morning ad nauseum! Somehow, you must find the way to entice the child to the work and make him believe he can succeed with it.

*Managing Work Space:* Children with EF deficits often have difficulty with visual-spatial organization. Our consistent organization and precise layout of materials helps tremendously in this area. Every time we present card materials, for example, we always place the first card in the top left of the work space. The next card goes just below that and then next below that in a precise column. Closed boxes/empty trays are always set on the top right of the work space (out of the way). The way we lay out the materials for polishing, table scrubbing, and other practical life activities follows this same pattern, always from left-to-right, top-to-bottom in order of use. Our precision throughout the classroom can then be absorbed and, ultimately, practiced by the child.

*Preliminary Exercises:* Many children proceed quickly past the preliminary exercises of how to carry a tray, a book, a chair, or a pitcher. They move with ease into full presentations. But children with EF challenges often need more preliminary exercises than other children. For example, before actually presenting how we polish wood, you may need to present how we take out the wood polishing work, place it in order on the mat, and then put it away in order. Their mind needs things broken down into smaller, more digestible tasks that they can repeat, build confidence, and master before moving on to more elaborate ones. To encourage this and inspire the child to want to do these exercises when you may encounter resistance, make it a habit of noticing how beautifully another child has set up their work. Regularly and noticeably appreciate the beauty of the order around you. Draw the child's attention to it. Notice it within the child when it presents itself in the tiniest way! And then, watch for it to grow. It may not grow at the pace we anticipate, but it will grow! Keeping detailed notes to track this evolution will prove very helpful for you and the child's parents in this regard. And it may keep you motivated to continue when we feel frustrated or unable to help. We are helping but the process is slow.

*Concentration:* If we want children to develop their powers of attention and concentration, the ability to attend one-pointedly to one certain stimuli, we must offer them uninterrupted time to practice concentrating and interesting/compelling/exciting concepts and activities upon which to concentrate. Of course, this necessitates a long block of "choice" time where the children can work at their own pace (without interruption) upon what *they* find interesting. This work period cannot be interrupted by special activities, group snack, or whole class circle time. The individual activities of the child also must be vigilantly protected from interruption. So, when we discover that Shane has left one work out on one side of the room but is *finally* focusing on something on the other side of the room, we wait until his concentration has ended before

drawing his attention to his unfinished business. Really, we just *always wait until the child's concentration has ended* before intervening/interrupting/redirecting in anyway.

### **Recall & Working Memory**

Well, if this doesn't sound like it is covered in a Montessori environment, I don't know what is! Memory training is everywhere in the environment. In the most obvious example, children have to remember where things belong on the shelves in order to complete their work cycle. Of course there are many specific examples as well.

*Command Games:* We directly train memory by playing bring me games and command/listen and do games ("I'm going to ask you to do something and then you get to go and do it!" Such fun.) If one of your children is struggling with memory challenges, take a look at how he manages these oral instructions. Are his struggles limited to oral instruction? Is he able to succeed in memorizing the names of the sandpaper numerals/letters? Focus on the earlier trainings of the eye, ear, logical mind, and self-confidence. Steep the child in practical life exercises. Free them to scrub every table and chair in the room...every day!

*Sorting:* Whether this is done visually with photo cards/utensils/cloths or stereognostically (blindfolded) with beads of different sizes or textures, sorting requires the child to identify similarities and differences among items. They must retain in their working memory relevant details and discard irrelevant ones. Thus, sorting, grouping, and classifying is a means of exercising and strengthening EF skills. Just like with physical exercise, consistent repetition that stretches the child just enough is what leads to increased ability. If the child is overwhelmed with tasks that are too difficult, they will not want to repeat it. Offer varied sorting and classification activities that match the developing needs of the children. And remember that the child may sort things in unexpected way...and this is fine. We may want them to sort around the house items from transportation but they may sort based on shape, size, color, or some other attribute. Once they have sorted, ask them to tell you about what they did. This is a great opportunity to develop your relationship with them...and see more clearly the wisdom inside the child.

### **Emotion & Inhibition (Self-Regulation)**

Self regulation develops as the child integrates emotion with cognition. Children discover that they can choose how they respond to their emotions rather than being chained to an impulsive reaction. In the earliest years, these responses are automatic but with the development of the will, emotional responses become intentional. So, when a child seems to be "testing" you, they are flexing their self-regulation EF muscles. Self-regulation develops hand-in-hand with work-related skills like following directions, taking turns, staying on task, and organizing materials (McClelland, 2000). Sound familiar?

*Grace & Courtesy:* Emotional connection is an essential component of learning and is intrinsically connected with EFs. Support this by (1) remaining by the door and greeting each child as s/he enters each day (notice who seems out of sorts and will, therefore, need more attention that morning); (2) presenting grace & courtesy small group lessons everyday (maybe first thing in the morning so it becomes routine); (3) model compassion/trust (assume the child has done something right/for good reason even when circumstances initially indicate otherwise; in other words, pause before you step in); and (4) when you must correct a child, do so

privately...just as you would hope to be treated (it's hard enough to hear that you've erred than to have everyone else's attention drawn to that as well).

*Patterns:* Creating patterns develops self-regulation skills (Bodrova, 2007). In traditional preschools/kindergartens, children use blocks and other materials to create and repeat patterns. In the traditional Montessori pedagogy, patterns are everywhere but not explicitly taught. The environment is rich with patterns and the child is left to absorb and discover them. For example, there is the pattern of progressing from left-to-right, top-to-bottom in laying out and completing any activity in the classroom. In sensorial, there are patterns to laying out the smallest to the largest or largest to the smallest cube, prism, and cylinder. In sorting, children create patterns in how they group the sorted/classified materials. But by far my favorite example of patterns is in the grammar work. Again and again, children see and create the pattern of article/adjective/noun (an ABC ABC ABC pattern), adverb/verb (an AB AB AB pattern), or verb/adverb (a BA BA BA pattern). Keep in mind that most children are able to read at the basic phonetic level in their third/kindergarten year and, with proper word selection, that is all that is required for the grammar work. Many of us never seem to “get to” the grammar work; this omission has significant long-term repercussions.

*Detective Adjective:* The process of eliminating extraneous triangles develops EF. First the child has to sort out all the triangles of one color (e.g., red) and put the blue and yellow ones out of sight, back in the box. Next, s/he discards the triangles of the wrong size. This continues to angles and then sides. At each point, the child is determining what information is relevant and what is not. This ability to discard irrelevant information is often compromised in children with EF deficits.

These are some suggestions that may guide you in your work with children facing challenges with their executive functions. This is by no means an exhaustive list. The true answers for any child are not to be found on this page. They are within the child himself. We do not know the gifts each of our children will offer this world. We can only guide them along a wholesome path and allow their beauty to reveal itself. And as you go through that process of observation and adaptation with your children, you will likely discover new approaches and strategies that would be of use. So I look forward to seeing *your* articles in the near future!

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