

Fostering executive functions the Montessori way

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I invite you to sit down quietly and observe what happens in a Montessori classroom. You see children choose their work, bring it to their table and start working on it. None of the children are working with the same materials, yet they work quietly, with concentration, and without disturbing others. Once finished using the materials, they return them to their proper place on the shelves.

This may look like an ordinary day in a Montessori classroom. However, for teachers to manage such a classroom, and for children to work and learn this way, concentration and normalisation are the keys. A crucial prerequisite for the successful development of concentration and normalisation is children's executive functioning. In this blog, I will explain what executive functions are and describe, out of many options, three ways how executive functions can be fostered in a Montessori classroom.

In Montessori's pedagogy the development of concentration is perceived as crucial¹. It's obvious: thirty children in one classroom, all working with their own chosen work and different materials, but still working quietly requires children to concentrate, pay attention and focus on their own work. The development of concentration is one of the most important aspects of the Montessori method because it leads to, in the words of Montessori, 'normalisation'. So-called 'normalised children' demonstrate discipline and self-control, they take initiative, are independent, self-conscious, and enjoy learning. In short: normalised children direct and control their behaviour. In addition, according to Montessori normalised children can attain extraordinary achievements in their development². And that's exactly what children need when working in a Montessori classroom. So, the first aim is to support children in how to concentrate, because concentration leads to normalisation. But concentration is not something we can demand or enforce but comes from within the child itself. One crucial precondition for the development of concentration is children having well-developed executive functions.

Executive functions

Executive functions are skills that enable children to solve problems, plan, reason, and adjust their behaviour. They help children to direct and control their behaviour to achieve a certain goal. Executive functions help children to remember the information they need to complete a task, filter distractions, resist non-productive impulses, and sustain attention when working on an activity³. Executive functions are essential when performing new and complex tasks that require continuous conscious attention and effort⁴.

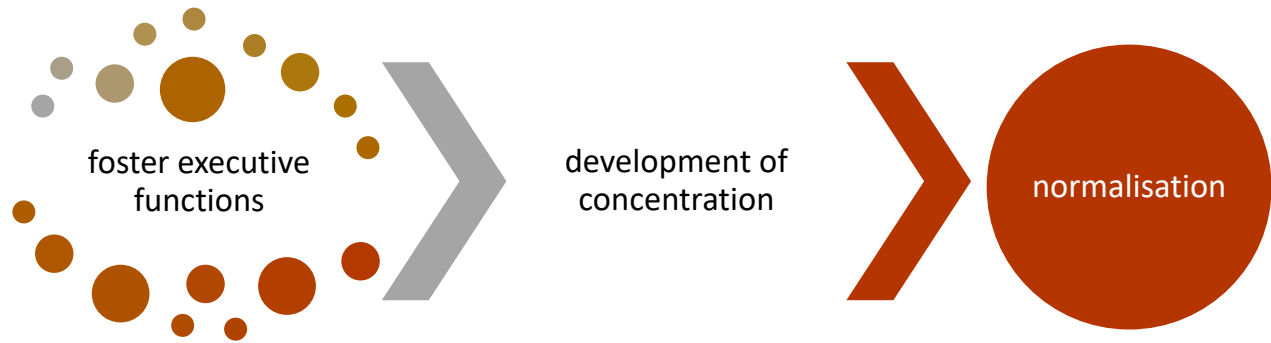
In short: executive functions help children to concentrate. Concentrating in a Montessori classroom requires children's executive functions to be well-developed. Despite the fact that children aren't born with executive function skills, they are born with the potential to develop them³. But the development of executive functions does not happen by itself, we need to help children to foster their executive functions in order to help them to develop concentration. The good news is: executive functions can be trained!

¹ Montessori, M. (1967). The absorbent mind. New York: Holt, Rinehart and Winston.

² Montessori, M. (1967). The absorbent mind. New York: Holt, Rinehart and Winston.

³ Center on the Developing Child at Harvard University (2011). Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function: Working Paper No.11. <http://www.developingchild.harvard.edu>

⁴ Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive psychology*, 41(1), 49-100.



Fostering executive functions are a crucial precondition for the development of concentration. Concentration leads to normalised children.

Improving executive functions

Adele Diamond, Professor of Developmental Cognitive Neuroscience at the University of British Columbia and a leading expert in the field of executive functions, predicts many activities will likely improve executive functions, but only when some conditions are met. Programs that will most successfully improve executive functions are those that challenge executive functions continually in new and different ways, programs which will be personally meaningful and relevant for the children, programs which will have a guide who is supportive, who will bring children joy and pride, and who will give them a feeling of social inclusion and belonging⁵⁶.

Not surprisingly, Diamond suggests the Montessori method is an effective approach for training executive functions⁶. The Montessori method shares many of the characteristics that Diamond suggests when it comes to improving executive functions. The Montessori method helps children foster their executive functions in a direct way by constantly challenging them to do so at a higher level and adopting an active and practical approach to learning, and in an indirect way, by nurturing children's joy, pride, and self-confidence. Let's take a closer look at three examples how to foster executive functions the Montessori way.

Challenge them!

The first, direct route, to foster executive functions in the Montessori classroom is to find an activity that is so well adapted to the child's interest that they provoke their deep attention⁷. Executive functions come into play when children are working on complex and new and interesting activities. Activities performed on "autopilot" do not train executive functions. Training executive functions does not mean just using them, you need to challenge them. That is exactly what Montessori teachers do. They observe children and then consider what the next step in the children's development might be. Later they motivate children to improve themselves, not by pushing them, but by encouraging them to choose activities that will bring them one step further. It is therefore necessary that the teacher, together with the child, finds an activity in which the child feels challenged and which is meaningful for the child. Montessori teachers constantly try to challenge children to work in their zone of proximal development. Diamond suggest the Montessori method challenges

⁵ Diamond, A. (2012). Activities and Programs That Improve Children's Executive Functions. *Current Directions in Psychological Science*, 21(5), 335–341.

⁶ Diamond, A. & Ling, D. (2020). Review of the Evidence on, and Fundamental Questions About, Efforts to Improve Executive Functions, Including Working Memory. *Cognitive and Working Memory Training: Perspectives from Psychology, Neuroscience, and Human Development* (pp.143-431) Publisher: Oxford University Press.

⁷ Montessori, M. (1967). *The absorbent mind*. New York: Holt, Rinehart and Winston.

children's executive functions throughout the day, embedding the practice of executive functions in all kinds of activities⁹.

Walk the line

Another example of a direct route to foster executive functions is the use of two typical Montessori lessons; walking the line and the silence lesson. While holding an object in one hand, children carefully walk on an oval line and they respond to music by going one way or the other. Properly walking the line requires children to maintain focus, ignore distractions, control and resist impulses, and to sustain attention when walking the line. The same applies for the silent game. While sitting in one room, the children together make silence. The teacher stands in the hallway, calling children by name, one by one. The children should not respond to other names, stay fully silenced, and control their bodies so they don't make any sound. Only when called by their own name, children respond to their teacher by quietly walking out the classroom, without disturbing other's. Children need to control their movement, suppress irrelevant impulses and stay focussed. Looking at activities like walking the line and the silent game in more detail, we learn that these types of activities are not only fun to do, they also help children to train their executive functions.

Be an example

One more indirect route to foster executive functions is to create a supportive environment in which the teacher is a good example for the children. Teachers who model how they solve problems, understand and express emotions, or control impulsive behaviour, seem to have an indirect impact on children's executive functions⁸. Like it or not, as a teacher you are always a pedagogical example. Teachers who model how they deal with mistakes, failure or success, set the standard for an environment that helps children to feel safe, take risks and try⁹. The way teachers model behaviour and create a supportive environment, will help children to increase their feeling of social belonging, build confidence to try, practice and take risks, and be proud when achieving goals. Children show better executive functioning when they are happy and feel socially supported⁹. Cultivating enjoyment in learning, self-esteem and pride are core elements of the Montessori environment and preconditions when we want to foster children's executive functions.

It does not happen by itself

Let's go back to the Montessori classroom. For children to work and learn in a Montessori classroom like this, children need to develop concentration. One precondition for developing concentration is that children need well-developed executive functions. When choosing materials, working without getting distracted concentrated, and quietly, children appeal to their executive functions. The development of executive functions does not happen by itself, we need to help children to foster and train executive functions by challenging them to do things at a higher level, by being a good example or by training executive functions in activities like walking the line or the silence game. Therefore, fostering children's executive functions the Montessori way starts with the teacher!

⁸ Center on the Developing Child at Harvard University (2011). Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function: Working Paper No.11. <http://www.developingchild.harvard.edu>

⁹ Diamond, A. & Ling, D. (2020). Review of the Evidence on, and Fundamental Questions About, Efforts to Improve Executive Functions, Including Working Memory. Cognitive and Working Memory Training: Perspectives from Psychology, Neuroscience, and Human Development (pp.143-431) Publisher: Oxford University Press.