

This tip sheet introduces executive function and self-regulation, how adults can support these skills in children, and important new research on the role of culture and context.

EXECUTIVE FUNCTION

Executive function is a term used to encompass a set of skills that allow people to control their own behavior and direct it towards longer-term goals, rather than what is automatic or easiest to do. Long-term goals could include things such as passing first grade, maintaining a friendship, or learning to play piano. Concepts such as willpower, self-control, focus, and perseverance are thought to share common building blocks of executive function. Executive function is a brain-based capacity that is closely related to the development of the prefrontal cortex. Executive function shows significant growth in the preschool years and then again in adolescence (Carlson, Zelazo, & Faja, 2013). There are three components typically used to describe executive function:

1. **WORKING MEMORY:** the ability to hold and work with multiple pieces of information at a time
 - For children: Following multiple-step instructions- "put on your coat, hat, and mittens."
2. **COGNITIVE FLEXIBILITY:** the ability to switch back and forth between different ways of thinking about something, using different perspectives
 - For children: Changing behavior when moving from the park to the library.
3. **INHIBITORY CONTROL:** the ability to stop an automatic response or resist distraction
 - For children: Stopping an action, such as running, when their name is called.

One metaphor used to describe executive function is air traffic control:

"One way to think about executive function is as Air Traffic Control at a busy airport. Some planes have to land and others have to take off at the same time, but there's only so much room on the ground and in the air. The mechanism that acts as Air Traffic Control is executive function. It regulates the flow of information and the focus on tasks, creates mental priorities and avoids collisions, and keeps the system flexible and on time.

In children, this mechanism needs to be actively geared up as early as possible."

– (Kendall-Taylor et al., 2010).

CO-REGULATION AND SELF-REGULATION

Children develop the ability to control their own behavior through interactions with adults. Beginning in infancy, adults are crucial to helping children through cycles of arousal and calm, starting with physical states such as hunger and sleep, and progressing through emotional states in early childhood. Co-regulation refers to the process of "borrowing" calm from someone else's nervous system to assist in calming oneself. Children's experiences using a trusted, safe adult to assist them in returning to a regulated state gradually become internalized. What is first done as a partnership can increasingly be done individually by the child as they develop through early childhood.

“When little people are overwhelmed by big emotions, it's our job to share our calm, not join their chaos.”

-L. R. Knost

As children learn knowledge, language, strategies, and tools around emotions and emotion regulation, they are more able to transition between states on their own, displaying the capacity for self-regulation. However, co-regulation continues to be an important way that people regulate their emotions across the lifespan. Adults frequently use partners, friends, and others to help regulate their own emotions. Adults such as parents, child-care providers, teachers, and coaches continue to play this essential role for children across childhood and adolescence (Rosanbalm & Murray, 2017).

“We know that a dysregulated adult cannot regulate a dysregulated child. An exhausted, frustrated, dysregulated adult can't regulate anybody.”

-Bruce D. Perry

THE ROLE OF CULTURE AND CONTEXT

Early research treated executive function and self-regulation as internal capacities, but more recent research is highlighting the role of environment and socialization in the development of these skills. Children from lower socio-economic backgrounds have often been found to have lower levels of executive function, leading some to suggest that interventions to promote executive function could help to close academic achievement gaps.

However, new research shows that rather than “lacking” executive function because of deficits in the environment (e.g., poor parenting, low resources), children may learn the skills that are most adaptive to their environment. It has been proposed that we should reframe our understanding of self-regulation as using skills in service of specific goals. The goals that children have been socialized to hold are strongly rooted in cultural beliefs, norms, and values. Improvements in executive function as children age may be in large part due to their ability to internalize the knowledge and values of what goals are desirable. Executive function does not develop in a lab; it develops during daily home activities, arguments with siblings, and playing at school with friends. These contexts are complex and any goal to regulate behavior (e.g., not hit a peer) relies on inhibitory skill, as well as strategies for conflict management and desire to preserve a friendship (Doebel, 2020).

Experiments have shown that when children interact with an adult who has shown to be unreliable (e.g., not bringing the “fancy” supplies for an art project they promised to have), children then do not wait as long in another delayed gratification task. This shows that children can quickly adapt to their environment, as delaying becomes less useful in contexts where rewards are uncertain. Thus, what researchers think of as “success” in delaying gratification may reflect children’s expectations of the world and the adults around them as much as any internal skill or capacity (Kidd et al., 2013; Moffett et al., 2020).

Executive function tasks have been primarily developed by White researchers in Western contexts. Thus, these tasks may be capturing the skills most valued in that culture, rather than a holistic picture of a child’s skill or capacity.

Introducing It: Executive Function and Self-Regulation Development in Young Children

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For example, “*For Black children, Afrocultural styles of verve (receptiveness for heightened levels of physical stimulation), communalism (a commitment to social connectedness, including an awareness that social bonds transcend the individual), affect (an emphasis on emotion and the ability to be emotionally expressive), movement (an emphasis on the interconnectedness of movement, dance, rhythm, and percussiveness), and orality (emphasizing oral and aural modes of communication) have been shown to be inconsistent with traditional classroom structures (e.g., bureaucracy, individualism, and competition)*” and could be interpreted as children not exhibiting “expected” self-regulation (Miller-Cotto et al., 2021, p. 8). A child may be well-adapted to the values and expectations of their home. We need to be careful not to jump to seeing deficits when that child is in a new context such as school, with different expectations.

DEFINING IT

Executive Function

A set of brain-based skills that allow people to control their own behavior and direct it towards longer-term goals rather than what is automatic or easiest to do

Co-regulation

The process of using a trusted relationship to “borrow” calm from someone else’s nervous system to assist in calming oneself

Self-regulation

The ability to regulate emotion and arousal (e.g., frustration, excitement) in order to complete a task or goal

DIVING INTO IT

For additional information on this topic,

Visit the Harvard Center on the Developing Child- Executive Function & Self Regulation:
<https://developingchild.harvard.edu/science/key-concepts/executive-function/>

Please visit CEED's website: <http://cehd.umn.edu/ceed>

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