



MEASURE WHAT MATTERS!

Vroom Interview with Reflection Sciences Co-founder, Dr. Phil Zelazo

Source: www.joinvroom.org/

What are executive function skills?

ZELAZO: Executive function (EF) skills are the attention-regulation skills we use when we deliberately try to do something. These skills make it possible for us to consider our options and their consequences, to keep goals and other relevant information in mind, and to resist distraction and withstand the temptation to respond impulsively.

EF skills contrast *crystallized intelligence*—which is based on facts and knowledge such as knowing vocabulary words—and allow us to put our knowledge to practical use to solve problems.

[We] focus on three facets of executive function:

- **Cognitive flexibility** involves considering something from multiple points of view. For example, understanding somebody else's perspective when it differs from our own or solving a math problem in different ways.
- **Working memory** involves holding information in mind so we can use it as a guide for understanding and responding. For example, recalling ideas we are reading about or remembering a plan until it is carried out.
- **Inhibitory control** is important for ignoring distractions, resisting the temptation to behave impulsively, or to go on automatic.

Why are executive function skills important?

ZELAZO: EF skills provide a foundation for learning and adaptation. There's evidence that children with better EF skills learn more efficiently; they get more out of learning experiences.

Kids who come into a classroom without well-developed EF skills may be distracted, fail to remember rules, or act out in class. And the consequence is that they're going to end up learning less efficiently than kids with stronger EF skills.



What can parents and teachers do to promote the development of executive function skills?

ZELAZO: Parents & teachers can give opportunities to practice reflection and using their EF skills:

- Provide children with challenges that are appropriate to their skill level—challenging but not overwhelming.
- Encourage children to notice when EF skills—like considering different viewpoints—are needed.
- Encourage them to reflect by stepping back, considering what happened, and learning in positive ways from their mistakes. You can do this in the context of a game, such as Simon Says.

QUESTION: What would you say to parents and teachers based on your research?

ZELAZO: Executive function skills can be cultivated and strengthened, and the preschool years are a prime time for this!

These are skills that you learn by doing. You can't simply be told about EF skills and then know how to use them. I like to say that we grow our brains in particular ways by using them in particular ways. So if we want to improve our executive function skills, we need to practice these skills.

Can we use self-control for kids as a predictor of later outcomes?

In the late 60s, American Psychologist **Dr. Walter Mischel** began one of the most recognized studies in developmental psychology known today: the “**Stanford Marshmallow Experiment**”.

Mischel and his research team put a marshmallow in front of a child and told them that they had two options: they could eat the marshmallow now, or they could wait for a said amount of time and get *another* marshmallow. The experimenters left the room, leaving the child alone with the marshmallow.



As you might expect, some of the children in the experiment popped the marshmallow in their mouths as soon as the researcher left.

Some were able to wait for a small amount time before caving in. Another subset, on the other hand, were able to hold out for periods of up to fifteen minutes for the researcher to return and give them their second marshmallow.

This range in gratification delay puzzled Mischel and his team. Why were some children able to wait so much longer than others? And what implications do we see in later years?

Years later, Mischel noticed a trend. He discovered that the children’s ability to delay gratification, i.e. wait longer for a second marshmallow, was a better predictor of later **SAT scores** than measures of **IQ** at the time of testing.

In a related study by **Dr. Terrie Moffitt** the children who showed poor self-control in their early years had lower paying jobs, more problems with substance abuse, and a higher likelihood of a criminal conviction 32 years later.

So how do we teach impulse control to children?

Self-control is one element of the neurocognitive skillset known as Executive Function (EF). Unlike IQ, EF is a trainable skill that can be molded in early childhood. Much of the research on EF and self-control interventions have come the conclusion that for intervention to be effective, training must become *increasingly demanding* as this skillset develops. This means that the key is to keep training varied, appropriately difficult, and novel.

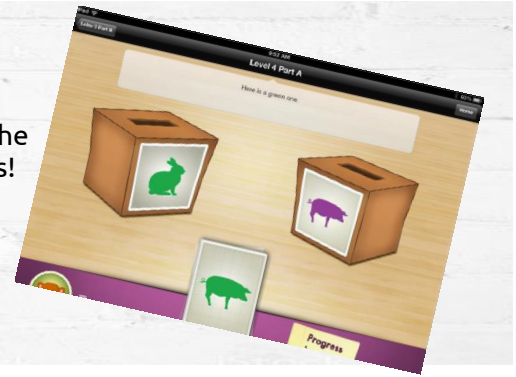
Here are some things you can try at home:

- **Develop consistent routines for things that happen every day** like eating, bath time, and bedtime. When children get used to routines they can form expectations about what will happen next, which makes it easier for them to stay regulated!
- **Talk to your child about thoughts and emotions.** Use a variety of words that describe emotional states (e.g. excited, worried, jealous) and what goes on inside people’s heads (e.g. thinking, wanting). Talk both about what your child is feeling and what other people around them are feeling. When your child has the words to talk about their internal world, they are better able to express and regulate themselves, and they also learn more empathy for others!
- **Play games that require children to follow rules and control their body.** These games, such as Red Light Green Light or the B-I-N-G-O song, require the child to pay close attention and also inhibit impulsive movement, which is great for learning impulse-control!
- **Encourage your preschooler to be creative and implement their own ideas.** For instance, say your preschooler wants to make a fort in the living room. You can help them determine what supplies they will need for the fort and show them helpful construction techniques.

Release of the MEFS App version 1.1.23!

Reflection Sciences is proud to announce that we have just released the Minnesota Executive Function Scale (MEFS™) version 1.1.23 on iTunes!

This update includes the latest language addition: **Somali**, bringing the total to seven available languages (others include English, Spanish, Dutch, German [Swiss], Swedish, and Mandarin Chinese).



Metacognition and Executive Function: A Dynamic Relationship

Executive function and metacognition both help with behavior regulation, problem solving, and more — skills that are crucial to success in school and in life. These two sets of cognitive processes have more in common than not, but they've traditionally been studied separately rather than in conjunction by research communities.

Metacognitive thinking has been studied by researchers conducting experiments in natural environments to observe and gather information about practical applications. Executive function has largely been studied by cognitive neuroscientists with an emphasis on how executive function skills link to brain structure and neural networks.

Let's take a closer look at these two approaches.

Executive Function

Executive function is the set of neurocognitive processes that help with impulse control, attention, working memory and cognitive flexibility. These skills are associated with the prefrontal cortex as well as other areas of the brain.

Metacognition

On its most basic level, metacognition is thinking about thinking. It is defined as the awareness and understanding of one's own thought processes. Metacognitive thinking strategies allow people to be aware of their own learning and memory and improve them.



A Dynamic Cognitive Relationship

Metacognitive strategies and executive function skills can both be taught and have similar timetables of development, but metacognition is considered to be the behavioral output of executive functions. For example, metacognitive skills are crucial in reading comprehension. In order to understand text, readers must be able to monitor their comprehension and apply strategies to improve it, such as re-reading a sentence that wasn't fully processed. EF skills assist with this, such as using working memory to hold in mind the information at the beginning of a passage to the end. EF also helps to support the focus and reflection needed to complete these metacognitive tasks. Therefore, the relation between these two cognitive processes is dynamic — they function separately but are interconnected.

Do stronger EF skills improve metacognition skills? More research on these processes in tandem is needed to gain further understanding of exactly how they work together. Researchers at the University of Bern in Switzerland are doing just that. They are using the MEFS by Reflection Sciences along with several measures of metacognition to study the development of these key skills for academic achievement. Stay tuned for the results!