

What Is Executive Function?

Executive function is the term used by neurologists to describe the brain processes that drive our ability to focus, solve problems, organize ourselves, remember information, learn from mistakes, and manage impulses, all of which help us learn efficiently and develop important social skills (Blair, 2002).

Dr. Russell Barkley and Dr. Thomas Brown, noted researchers in the area of attention deficit disorder (ADD), use the analogy of an orchestra conductor to describe the brain's executive function. A conductor's job is to direct each member of the orchestra in order to create the most beautiful sound possible. No matter how talented the musicians, if the conductor doesn't keep the pace and intensity of the playing coordinated, the result can be ugly. If our brain's conductor is under-active, we will have the same outcome: the lack of focus and integration will cause us to perform poorly (Barkley, Murphy, & Fischer, 2008).

During the last 20 years, neuroscientists have made remarkable progress in understanding how the brain works, but we are just beginning to realize how crucial this information can be for parents and educators. Understanding how executive skills develop can help adults figure out the best responses to academic and behavioral problems that are often mistaken for laziness, carelessness, or lack of motivation.

We know there is wide disparity in people's capacity to manage executive skills. This disparity is especially noticeable in children because the prefrontal cortex is in a constant and uneven state of development.

The Maturation Process

Compare your ability to plan, manage time, maintain focus, and control impulses with that of a 5-year-old. Although 5-year-olds are beginning to handle these tasks, natural maturation of the brain and experience make adults quicker and more efficient. Executive

functioning skills, such as predicting what is likely to happen next, solving complex problems, and judging when and how long to work on a project, become easier for us as the brain matures.

Studies show that even though the executive processes start developing in infancy, these cognitive skills develop at different rates and over a long period. The skills of inhibition (overriding automatic responses) and working memory (holding information long enough to work with it) are the first to show significant growth in preschool children. Planning, attention span, and organization show a spike in development around age 5 but don't peak until our mid- to late 20s. During the adolescent years, all of these brain systems become faster and more sophisticated, and the skills of self-monitoring, mental flexibility, and persistence become noticeably stronger (Diamond, 2002).

The level of a child's executive function skills is not highly predictable by age because the developmental rate of the prefrontal cortex, which governs the function, can vary by a large degree from person to person. Some students may have skills that seem behind or ahead of the rest of the class, and as we have seen in the examples at the opening of this chapter, the problems that manifest can easily be interpreted as signs of a possible disability or lack of effort. Before jumping to testing, labeling, or punishing, it is important to try supporting students with interventions for various executive skills like organization, self-monitoring, multi-tasking, and memory. Many students get mislabeled as students with disabilities when what they really need is ongoing support while their brains go through the normal maturation process

Contrary to popular belief, it is the level of executive function skills, especially in the area of working memory, rather than IQ that is the best predictor of success in reading, spelling, and math (Alloway & Alloway, 2010). Classroom teachers often describe struggling children as being inattentive or as having low IQ, but rarely do they put their finger on working memory and related executive subskills as the key reasons for poor

performance. The good news is that these skills, unlike IQ, are easily addressed in school with early interventions in the classroom.

Although executive control has little to do with a person's IQ, the likelihood is high that students with cognitive disabilities will have difficulties in several areas of executive functioning (Brown, 2005). Barkley's research (Barkley et al., 2008) reported that 89-98 percent of children diagnosed as having ADD have deficits in multiple areas of executive function. This means that students with disabilities can be as much as three years behind their peers in some aspects of executive maturity. Ask a room full of special education teachers if their students experience problems with organization, memory, and attention span, and every hand in the room will go up. But ask a room of middle school general education teachers the same question, and you will find that students with disabilities aren't the only ones who struggle in these areas.

Genetics, disabilities, stage of life, gender, quality of family life, self-concept, and stress levels affect the natural timeline for the development of executive functioning. Life experiences, good nutrition, and sensitive adult guidance also contribute to how well and how fast these problem-solving and self-regulation abilities mature. The good news is there are many things parents and educators can do to nurture the executive skills of students with disabilities and general education students alike.

We can help students feel more capable by adjusting expectations to offer enough challenge to keep growth and interest high without crossing the line into frustration. Providing the right amount of modeling and support, based on what we know about a student's stage of brain development, establishes a safe and welcoming environment for growth. When punishment instead of support is our response, we can actually stall the developmental process.