

Executive Functions: Relevance to Learning  
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*Executive function* is a neuropsychological term that refers to a collection of cognitive processes required to plan, direct, and manage purposeful, goal-directed, problem-solving behavior. Specifically, these processes include: (a) *planning* – the ability to create a roadmap to reach a goal or to complete a task, (b) *organization* – the ability to arrange or place things according to a system, (c) *time management* – the capacity to estimate how much time one has, how to allocate it, and how to stay within time limits and deadlines, (d) *working memory* – the ability to hold information in mind while performing complex tasks, (e) *metacognition* – the ability to stand back and take a “bird’s eye view” of oneself in a particular situation, (f) *response inhibition* – the capacity to think before acting, (g) *emotional control* – the ability to manage emotions, (h) *task initiation* – the ability to begin a task without undue procrastination, (i) *cognitive flexibility* – the ability to revise plans in the face of obstacles, setbacks, new information, or mistakes, and (j) *goal directed persistence* – the capacity or drive to follow through and complete a goal despite competing demands.

As you can discern from the description of executive functions, these processes are extremely important to many aspects of our lives. As a psychologist, I frequently work with individuals with varying degrees of executive dysfunction, in identifying how these deficits affect daily life, and determining what interventions will remediate these challenges. One area in which executive functioning is indeed relevant is that of learning. A few years ago I had the opportunity to temporarily work for a local school district. This district was located in an affluent suburb and had excellent staff in their special education department. To my surprise, this district was not current in terms of how the assessment of executive functions was a necessary component of a thorough psychoeducational assessment. In fact, when I offered to assess the executive functions of a particular student I was asked by a supervisor “How do executive functions drive instruction?” To say the least I was dumbfounded by the question. Of course executive functions should drive instruction! Executive functions are the highest order of functioning known and play an extensive role in everything we do – including learning.

When we consider preschool children, the developmental tasks include: to run simple errands (e.g., get their coat from the closet), clean up their play area, perform simple self-care tasks with reminders (e.g., brush teeth), and inhibit certain behaviors (e.g., don’t run in front of cars, don’t touch hot stove, etc.). By kindergarten, children are expected to run errands (two to three step directions, perform simple chores, bring papers and assignments to and from school, complete their homework assignments, and inhibit behaviors (e.g., blurting out without raising hand). Between third and fifth grades, children should be able to run errands that are more complex (e.g., extended time, greater distance, remembering instructions), undertaking chores that require 15 – 30 minutes to complete, keeping track of their belongings, completing a maximum of one hour of homework, saving money for a desired purchase, and self-regulating (e.g., behaving oneself when teacher is out of the classroom, refraining from temper tantrums).

In middle school (grades 6 – 8) children should be able to help with chores around the home, including daily responsibilities between 60 – 90 minutes, baby-sit younger siblings for pay, organize schoolwork, follow a complex school schedule involving changing classes and teachers, plan and carry out long-term projects using a timeline, and time management of after school activities, including homework, family responsibilities, and inhibit rule-breaking behaviors.

In terms of high school-aged adolescents, as executive functions develop, we should expect more. For example, if executive functions are developing appropriately, a high-schooler should be able to manage their schoolwork effectively on a day-to-day basis, establish and refine long term goals and make successful plans to meet those goals, utilize leisure time in a productive manner (e.g., finding employment, becoming involved in worthwhile or philanthropic projects), and refraining from reckless and dangerous behavior such as alcohol and drug use, sexual acting out, and illegal activities.

Accurate assessment of executive functions is essential for effective intervention in the school arena for two reasons. First, these skills are closely related to the frontal regions of the brain, which represent a common pathway for human behavior. Second, the pattern of strengths and weaknesses in a child/adolescent's executive functions leads to a more thorough understanding that individual child and identifies the best possible learning environment needed for that child to succeed. If you are a parent of a child who is struggling with academics, a comprehensive evaluation of executive functions could provide valuable information for intervention planning that will help your child succeed in not only the learning environment, but in all aspects of daily functioning.