

## **Executive Functions: What are they? And why should we care?**

### **Executive Functions: What are they?**

The term Executive Function (EF) is a common, but imprecisely defined, term used by psychologists, teachers, and parents etc.. Psychologists use the term to describe the difficulties children and adolescents have with doing school work or to explain the challenges adults have with their employment and relationships. There is, however, a great deal of confusion about what EF is, how we measure it, and even if whether the way we measure it has anything to do with the individual's behaviors we observe day-to-day at school, work, or at home (Barkley 2012; Toplak, 2013).

Several of the more common definitions of EF are provided here:

One definition is that "The executive functions are a collection of processes that are responsible for guiding, directing, and managing cognitive, emotional, and behavioral functions, particularly during active, novel problem solving. The term *executive function* represents an umbrella construct that includes a collection of inter-related functions that are responsible for purposeful, goal-directed, problem-solving behavior." (Gioia, Isquith, Guy and Kenworthy, 2000).

The term EF is used to describe a set of cognitive processes that help students connect past experiences with present actions. Students use executive function when they perform such activities as planning, organizing, strategizing, and paying attention to and remembering details. Executive functions also enable students to manage their emotions and monitor their thoughts in order to work more efficiently and effectively (Guare & Dawson, 2004).

Barkley (2012) offers a more formal definition of EF as "the use of self-directed actions so as to choose goals and to select, enact, and sustain actions across time toward those goals usually in the context of others, often relying on social and cultural means for the maximization of one's longer-term welfare as the person defines that to be." The specific EF domains that have often been the subject of clinical

concern are: self-management across time, self-organization and problem solving; self-restraint (i.e., behavioral inhibition); self-motivation; and self-regulation of emotions.

Some metaphors have been proposed to help understand executive functions and the role it plays in everyday life. The most popular metaphor is the one that compares EF difficulties to a symphony orchestra made up of very fine musicians, but without a conductor to organize and integrate the musicians' individual efforts. Imagine a symphony orchestra in which each musician plays his or her instrument very well. If there is no conductor to organize the orchestra, to signal the introduction of the woodwinds or the fading out of the strings, or to convey an overall interpretation of the music to all players, the orchestra will not produce good music (Brown, 2013).

Deficits in EF are characteristic of several clinical disorders, most notably Autism Spectrum Disorders (ASD), Learning Disorders and Attention-Deficit/Hyperactivity Disorder (ADHD). There is a tremendous overlap between ADHD and EF. The majority of individuals with ADHD demonstrate behaviors that are associated with EF but not all individuals who demonstrate behaviors associated with EF difficulties have ADHD.

Despite confusion about what the term means, there is a consensus that good EFs are critical for success at school.

A student with executive deficits often has trouble with the following: organizing work (difficulty getting started on tasks); trouble completing tasks (starts tasks but may not finish); trouble managing materials (starts assignments/tasks without necessary materials); and trouble managing time (does not leave enough time to complete tasks); trouble managing attention (appears distractible and/or impulsive).

### **Students with Executive Functions are often considered “lazy” “unmotivated”**

Students with executive function difficulties are often considered “lazy” “unmotivated” by teachers and parents. Yet many of these students want to do well but do not have the skills or strategies to do so.

Parents and teachers must be careful not to attribute the particular production deficits they observe in a student to lack of interest, motivation, or apathy. Rather, these behaviors are often the result of inadequate activation of executive function capacities that are necessary for initiating, task monitoring, task completion, and organization etc. For example, in situations where children are having difficulties getting started on tasks, it is important to reframe the problem as an initiation difficulty rather than they lack motivation. Furthermore, what we say about children partly determines how they define themselves and influences how they will then behave.

EFs are developmental in nature and as such they emerge incrementally over the course of development. There is a great deal of variation relative to chronological age. Usually executive functions are not fully developed until the late teens or early 20s (Brown, 2013). Executive functions play a different role at different ages. For example very young children might use executive functions to play cooperatively with others, and to manage frustration in social situations. For adolescents, executive functions are needed for organizing and prioritizing the work for school; keeping their agendas up to date; getting their homework completed on time; for sustaining attention to handle more complex cognitive tasks. During adult years, demands of executive functions increase tremendously as the individual deals with the demands of higher education, working effectively with job requirements, budgeting money, and managing different types of relationships including dating, marriage, and parenting.

Typically the middle school years (i.e., grades 6-8) are when more parents report concerns around their child's ability to cope with performance expectations. In middle-school there is an increase in demands on organizational skills; memory; working more independently, as well as an increase on the ability to juggle more homework, more teachers, along with more complex academic work.

With younger children and adolescents, parents worry about their child's success at school and particularly they worry about the future. Therefore, they may intervene to the extent that the child is able to stay organized and does well. Therefore, with much parent support the child is able to stay afloat even

though the expectations have increased. Therefore, the impairments may stay masked until the teen enters the situation where such parental scaffolding is unavailable (i.e., high school).

EF is seen as a “performance deficit” (Cooper-Kahn & Dietzel). Children with ADHD know what to do but have trouble doing it consistently (performance disability). They often cannot accurately predict how they have performed or how they are doing. Furthermore, they may have trouble getting starting and keeping going. They seem to be more vulnerable to external factors (e.g., content of assignments, teacher personality, etc.) than peers.

Persons with ADHD who have higher IQs often are able to handle the demands of the increase in cognitive demands and get very high grades in elementary school. But if untreated these students may have significantly lower grades in secondary school and often have major struggles in college and university studies where they are required to function independent of adult support (Brown, 2005).

Executive functions are often situation dependent. That is, individuals with ADHD and EF difficulties tend to have some situations or activities where they are able to function very well but may be quite impaired in other situations. Individuals with ADHD have great difficulty sustaining attention on most activities unless it is of a matter of interest to them. If the task is intrinsically interesting to them (i.e., video games, sports) they can usually pay attention quite well. If it is not interesting, then they usually can't pay attention, even when they recognize the importance of doing so.

### **How does EF impact on academic performance?**

Difficulties with EF can be reflected in difficulties across academic tasks.

For example, even in the absence of difficulties with word decoding abilities, individuals can struggle with reading comprehension. The construction of meaning from text is very much dependent upon the quality of the student self-directed cognitive abilities (Hale and Fiorello, 2004). For example, it is

important that children read purposefully with specific questions in their mind when seeking specific information. Children need to refrain from jumping ahead when reading text and thus missing salient aspects of the passage. The ability to focus on the text for prolonged periods of time and resist distractions is important for comprehension of text.

Writing is a very laborious task for most children with ADHD. Students often have difficulty holding ideas in mind, acting upon and organizing the ideas, quickly retrieving grammar, spelling and punctuation rules from long-term memory, manipulating all this information, remembering ideas to write down, organizing the material in a logical sequence, and then reviewing and correcting errors.

When students work on a math problem, they must fluidly move back and forth between analytical skills and several levels of memory (working, short-term, and long-term memory). With word problems, they must hold several numbers and questions in mind while they decide how to work a problem. Next they must delve into long-term memory to find the correct math rule to use for the problem. Then they must hold important facts in mind while they apply the rules and shift information back and forth between working and short-term memory to work the problem and determine the answer.

## **OTMP**

Abikoff and Gallagher et al. (2012) suggested that the main problems identified by teachers, parents, clinicians fell within three main areas: Organization, Time Management and Planning or OTMP.

The results indicated that children vary in terms of how they think about what they have to do. Many children gain this knowledge through listening or watching others. Those with greater difficulties require explicit instruction- such as visual and verbal instruction as well as repeated exposure and practice.

Collectively, the authors noted that the main areas of OTMP skill problems as assessed by teachers clustered around three main components:

1) Organized behaviors: the efficient use of organizational tools and routines (e.g., “This student makes lists, schedules, and reminders to keep him/herself organized”); 2) Lapses in memory and materials management: the ability to remember assignments and keep track of materials needed for assignments (e.g., “This student loses things at school”); and 3) Task planning: effective time management and the ability to create and execute plans (e.g., “When this student has a big project to do, he/she doesn’t know where to begin.”

Content areas where students need help with developing procedures were Tracking Assignments; Managing Materials; Time Management; Process of Planning. The more difficult time children have in these content areas the more there was increased conflict at home and poorer school performance.

Homework time is often the most stressful time during the day. It is important to help children develop ways and means as well as develop routines in terms of tracking assignments, managing materials, time management and planning. Many children require explicit instruction to improve or develop skills in these areas.

### **Pharmacotherapy and Explicit Skill Training**

In general, children who have executive functioning issues require clear and simple directions on how to accomplish tasks and lots of reinforcement or praise when they display even the smallest attempts at using the skills taught. Repetition, modeling, and scaffolding the child to independently use the skills on their own are essential to the child’s success. When the skills become more over learned, they become more automatic.

Families who have children/adolescents struggling with ADHD and EF may also wish to explore pharmacological options with their physician.

### **Executive Functions in Adults with ADHD**

Many individuals who struggle with ADHD and EF in childhood and adolescence will continue to present with these symptoms in adulthood.

The most common complaints from adults with ADHD are that they struggle with further education, maintaining employment, relationships, and monetary concerns. Some adults with ADHD can find an academic environment or a profession that reflect their passion and interests which do not place the same demands on their executive function skills. Others, despite being very bright, have difficulties in planning things, and in initiating and completing them at the appropriate time.

Adults with ADHD may still have a tendency to wait until the last moment to complete a task, or often wait until the impending deadline becomes tomorrow. They may take on new, exciting projects but do not finish or make progress on previous projects. They may complete the less demanding tasks such as checking e-mails but may avoid more challenging tasks such as completing a report.

Adults with ADHD may benefit from both pharmacological options as well as psychosocial treatment, such as cognitive-behavioral therapy. Cognitive-behavioral therapy can help with time management, organization, and planning (Solanto, 2011).

Although not a psychosocial treatment for adult ADHD, coaching is an important adjunct to counseling and pharmacotherapy. Coaching is based on a wellness model, and interventions are aimed at supporting individuals in their efforts to achieve specific task-based goals such as organizing or completing a work project (Ratey, 2002).

A combination of pharmacotherapy and specialized psychosocial treatment, namely CBT, seems to be emerging as the foundation of treatment for the wide ranging effects of ADHD symptoms for adult patients (Ramsay and Rostain, 2008). However, a comprehensive treatment plan including medication, psychosocial treatments, as well as supportive coaching may be indicated.

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Jason Froats is a Performance Coach who helps students and adults effectively manage Executive Function Challenges such as organizational skills, self-confidence, procrastination, minimizing distractions; self-regulation; task prioritization and management using a strength-based approach to understanding EF difficulties and ADHD. Jason Froats Performance Coach Chrysalis Centre: 905-752-6789 Ext 123 [jason@exec-ute.com](mailto:jason@exec-ute.com)

CADDAC also has a list of Coaches on their website.

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