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Executive Functions: Skills to Promote Success in School and Beyond

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Many children diagnosed with Asperger Syndrome (AS) and High Functioning Autism (HFA) struggle with impairments in executive functioning (EF). Executive functions are defined as “an umbrella construct defined as the control, supervisory, or self-regulatory functions that organize and direct all cognitive activity, emotional response, and overt behavior” (Isquith, Crawford, Epsy, & Gioia, 2005). These weaknesses impede their already compromised ability to function. A child with average or above-average intelligence will often present with less than optimal performance at home and at school because of deficits in these ancillary skills that are crucial for success in these environments.

Some examples of common Executive Functions include difficulty in the following areas:

- Initiating Tasks - The ability to begin a task in a timely manner without procrastination or delay.
- Response Inhibition - The ability to think before immediately responding to a situation or event, as well as the capacity to resist the temptation to say or do something inappropriate.
- Organization - The ability to create and follow a system for keeping track of materials, personal space, as well as information
- Time Management - The ability to estimate accurate time periods for a task and stay within the time limit in order to meet deadlines and due dates.
- Emotion Regulation - The ability to manage emotions so that one can approach tasks and successfully respond to an academic or social demand without becoming too overwhelmed without becoming emotionally overwhelmed.
- Sustained Attention - The ability to maintain concentration on an activity or assignment without getting distracted frustrated or bored.

Executive functioning, then, clearly impacts many different facets of day-to-day life including cognitive, social-emotional, and behavioral elements. Executive dysfunction (EDF) can manifest as poor planning and organization, difficulties with problem-solving, perseveration, and inflexibility (Anderson 1998). For example, children who have deficits in organizing their materials and initiating a task at school may otherwise appear unmotivated or oppositional to a teacher who is not aware of his or her difficulties. With regard to social situations, a child with EDF who has trouble regulating emotions or inhibiting responses to peers may have a harder time picking up social cues in the environment and, as a result, demonstrate poor social cognition and perspective taking (Anderson 2002). This can lead to significant amounts of frustration, anxiety, and disappointment for the child diagnosed with an autism spectrum disorder as well

as his or her teachers, and family members.

Executive functioning skills essentially aid in our problem solving abilities so that we can strategically approach a situation to achieve desired goals. They are necessary for many of the daily tasks we encounter such as prioritizing our responsibilities, organizing our behaviors to meet long-term goals, and persisting on a task. Additionally, these abilities assist us in regulating our emotions and monitoring our reactions. Deficits in Executive Functioning manifest differently across multiple environments and impact children differently, depending on their developmental and cognitive abilities (Dawson & Guare, 2010).

In school-aged children with EF problems, parents may notice that their children have difficulty with ongoing routines such as getting ready for school in the morning or preparing for bedtime. Without constant verbal reminders from a parent, children often delay getting dressed, brushing teeth, and packing their bag packs. At school, the teacher typically finds it necessary to repeatedly prompt these students to begin an assignment or follow directions. These tasks require such EF skills as organization, initiation, shifting, and working memory. Additionally, homework is often an arduous task, as children with executive function deficits typically forget to bring home their worksheets from class or resist completing the work that is assigned. The weekends can also present as a challenging time for the child with executive function difficulties who cannot respond flexibly when plans are unexpectedly changed.

In middle school, there are many areas for students to utilize EF skills. Students need to learn to raise their hands before speaking, inhibit their emotional responses so that they are not making inappropriate comments in class, transition from preferred to non-preferred activities, and attend to group instruction without becoming distracted by external stimuli. Children who are lacking organizational skills may be unable to consistently write down assignments in a homework planner. In the home environment, time management skills become crucial. Deficits in EF result in a student who is unable to prioritize different homework assignments and instead, becomes overwhelmed and tantrums or, alternatively, becomes avoidant and refuses to complete homework assignments. Deficits in initiating and transitioning between tasks in the home are commonly seen with children who are expected to complete such chores as “clean your room.” Without having the ability to break down that task into smaller steps (throw out garbage, make the bed, put laundry in hamper, etc.) the child is not able to follow through on these responsibilities.

High School can present a significant increase in those challenges placed on an adolescent with EF deficits. Many assignments such as term papers and projects require long-term planning and the ability to break down assignments into smaller chunks. This can present an overwhelming challenge for a student who has difficulty understanding how to brainstorm ideas, create an outline, and organize different thoughts into a coherent thesis statement, all skills requiring executive functioning. Organizing a calendar, time management, and juggling different extracurricular activities are other areas of potential difficulty. Preparing for college and tackling the many steps towards transitioning to a new academic environment requires many executive functioning skills that these adolescents may not be adequately equipped to address. Daily living skills (chores, hygiene) as well as money management are additional areas that are necessary for this age group to master so that a gradual sense of independence can be fostered.

Executive Functions are mediated by the prefrontal cortex of the brain; however, it is likely that input is received and organized from other areas of the brain (Anderson 1998). Research suggests that EF develops throughout childhood, with growth spurts in frontal lobe development lasting through the beginning of adolescence (Anderson 2002). Childhood and adolescence are ideal times for an intervention, so that the brain can accommodate newly learned skills in the area of executive functioning.

If we can understand the particular deficits that are impacting a child’s functioning in childhood, parents and teachers can help to target those specific skills to ensure academic and social success. As a result, this information can help inform how much structure and support the child will need as they mature into adolescence and adulthood (Dawson & Guare, 2010).

In the early stages of development, parents and teachers undertake the role of setting guidelines and concrete steps and thus, act as the control center for the child’s executive functioning. However, as a child develops, the expectation is that he or she will be able to make more independent decisions and self-monitor behavior without the consistent guidance of adults (Meltzer, 2010). However, for children and adolescents with executive functioning deficits, these underdeveloped skills require continued support and teaching before they can become more fully independent. Such support can be provided by environmental modifications as well as specific skill development.

Some specific strategies to remediate the deficits in EF include both individual and group interventions that highlight specific deficits for each of the participants and include goals that are based on the personal needs and strengths of the individual participants. It is recommended that parents of a child on the autism spectrum look for a program that not only addresses the specific executive functioning deficits but also

keeps in mind the unique needs of the child. Additionally, it is essential that the parents or caregivers are included in the treatment so that the skills learned in the group are practiced, supervised and generalized to the home environment.

When considering appropriate interventions, the therapist needs to work with the parent to conduct a thorough assessment of the child's executive functioning profile. A comprehensive assessment is typically based on the child's performance at school as well as the home. Therefore, it is necessary for the treating therapist to collect assessment information from a variety of sources, including parent interviews, classroom observations, work samples, behavior checklists and formal assessment procedures. When prioritizing which executive functions are the most primary to address, a specific behavioral goal should be identified along with a measurable way to track progress. This creates a more successful outcome for the child. By creating a collaborative approach with the teacher, parents and therapist, the child is then placed in a consistently supportive environment where the intervention and the goals are clearly stated and encouraged.

For example, a child may present with deficits in the area of organization. At first, the therapist attempts to understand the nature of this deficit and how it manifests particularly for this child. Feedback is elicited from both teachers and parents to target specific areas of concern. An intervention is designed that reflects these deficits and includes measurable goals to adequately measure progress. The teacher can answer the question, "In order to increase (student's name) organizational skills, what are two behaviors, if targeted, that would lead to more academic success for this student?" The therapist then works with the child to create gradual steps that will enable the child to achieve those goals. Often, it will include a behavioral plan with parental involvement in which a child will be reinforced for positive behaviors to facilitate success. The child is taught to compensate for organizational difficulties as well, for example, by using color-coded folders that match textbooks or having a visual/written prompts placed near the locker or desk to remind the student to bring home specific books for homework. In the classroom, the teacher can use consistent classroom routines for elementary students so that the skills become more automatic. Routines can be established for managing supplies, turning in homework, entering/exiting the classroom, and writing down assignments from the board. Teachers can also use cueing (or prompting) that helps to guide the student to approach tasks in a consistent and thoughtful way. Teachers can cue by asking a student questions that help them prepare for the task, such as "What materials are you going to need to finish this assignment?" or "How will you know when you are finished?" Communication is fostered between the parents and the teachers using email or a notebook. Progress is tracked and continuously reinforced. In this way, the child's difficulty with organization is gradually improved.

Modifying the environment to facilitate success is often an important consideration when developing a successful intervention for a child with EF deficits. By creating a physical and social environment that matches the student's skills and needs, the child is in a better position to perform and behave in more successful ways. Such environmental modifications may include preferential seating to reduce distraction, modification of class assignment so that the long-term project is broken down into smaller tasks. Furthermore, modification of the social demands can be achieved by strategically pairing a child, during group work, with appropriate peers who can model the necessary skills and provide opportunities for the child to practice his/her skills. EF treatments that occur in a smaller group setting often use a modeling approach to facilitate improved EF skills for the student. In this way, the teacher or peer mentor can use the skill in front of the student and, at the time, explicitly teach how it can be successfully used in the classroom or at home.

When thinking about a child on the autism spectrum who is specifically challenged by an emotional regulation deficit, success will be maximized when there is a team approach. This provides the child with more of an opportunity to practice these new skills across different settings. For example, this can be seen in a middle school child who tends to melt down suddenly and without warning. The first step in addressing this behavior is identifying the triggers leading up to the meltdowns and defining the replacement behavior in each environment. For example, these triggers may occur in class when the child is asked to complete certain academic tasks and during recess when the child tends to get easily over-whelmed by group activities or social gatherings. After these difficult situations are identified, there are specific strategies that teachers, parents, and caregivers can use to help the child manage his or her emotions. These strategies can enable the child to complete the task, control emotional responses and successfully cope with the academic or social demand. In the school environment, a teacher can help the child break tasks into smaller steps to make the task more manageable. The teacher can also take notice of those situations that are triggers for emotional regulation problems (i.e. quizzes, tests, etc)

and give the child breaks during those specific tasks when he or she starts to show signs of becoming upset (fidgeting, pacing, wringing fingers, etc). Similarly, a parent or teacher can model the practice of positive self-talk that is encouraging and supportive. For example, the parent may model to the child a statement such as “ I know this activity is going to be hard but I am going to keep trying and when I am confused, I can ask for help.” Providing the child with a script to follow during certain situations can lessen the anxiety and enable to child to feel prepared to face a demanding social situation. For younger children, it can be helpful to use literature or social stories to teach emotional control. A parent can teach the child specific coping strategies that have worked at home which may include breathing exercises or even raising one’s hand to ask an adult for a break from the specific situation (family dinners that are very noisy and crowded, homework time when the child is working on a difficult assignment). Using a rating scale to help children identify and cope with their feelings can also foster a feeling of better control because it teaches the child that they have options when feeling overloaded. The Incredible 5-point scale (Buron & Curtis, 2003) uses a rating scale where children can rate their own behavior according to the severity of their feelings in a situation. In this way, the child, along with various members of his or her team, can become better equipped to handle these challenges through simultaneously shifting the child’s thought process and lessening the environmental triggers to maximize success.

Choosing the best treatment for children is crucial for continued independence and success as they grow and mature. Through empowering children and adolescents to overcome deficits in executive functioning, they are more likely to develop an increased awareness of their learning style, an improvement in their self-confidence, and a sense of internal motivation to succeed in the school, work or social environments.