

This edition of Getting Schooled focuses on **Executive Functioning**.

Drs. Barva, Schwartz and Zwiers have provided us with an overview of Executive Functioning that includes assessment considerations and evidence-based intervention strategies. This is timely information as School Psychologists are being asked to consult with school staff on how to support students who struggle in this area in the school environment. With the Inclusive Education emphasis on providing students with appropriate programming, School Psychologists have an opportunity to work with teachers to develop and implement both individualized interventions as well as universal design strategies that will enhance the learning of students who have these types of challenges.

Enjoy the read!!

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Paying Attention to Executive Functioning

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What is executive functioning and why does it (grey) matter?

You've likely seen this numerous times in the classroom or clinic. A child who is bright and engaging, but who also has a laundry list of nagging issues: Desk is a mess, can't follow sequential instructions, fails to complete assignments unless closely monitored, can't manage time or planning well, has a meltdown when frustrated, etc. Supported with appropriate psychoeducational assessment by and consultation with a school psychologist and related professionals, children with this profile can receive a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). As such, a diagnosis of ADHD means that significant symptoms of inattention or hyperactivity/impulsivity exist at levels above what would be expected of children at a comparable level of development. But the question remains: What are the primary causes of this inattention or hyperactive/impulsive behaviour in children?

In classrooms, laboratories, and clinic offices across Alberta, there is lots of discussion about advances in our understanding of attention deficit disorders in children and youth. Recently, this discussion has turned to considering that one of the core components of attention problems is within *executive functioning (EF)*. Often referred to as the "brain boss," EF represents a set of neurological structures that activate, organize, integrate, and manage other functions. EF helps

children and adolescents plan and account for short and long-term consequences of their actions, making adjustments along the way to achieve the desired goals.

Several models have been put forth to describe the critical constructs of EF. Russell Barkley (2008) breaks EF into four areas: Nonverbal working memory, internalization of speech (i.e., verbal working memory), reconstitution (i.e., planning and generativity), and self-regulation of affect/motivation/arousal. For Barkley, it is the ability to self-regulate behaviour that lies at the root of most children diagnosed with ADHD.

Alternatively, Tom Brown sees EF as best represented by six clusters that function “like a basket encompassing related cognitive functions that depend on and interact continuously with the others, in ever-shifting ways” (Brown, 2008). The six clusters are:

1. Organizing, prioritizing, and activating for tasks;
2. Focusing, sustaining, and shifting attention to task;
3. Regulating alertness, sustaining effort, and processing speed;
4. Managing frustration and modulating emotions;
5. Utilizing working memory and accessing recall; and
6. Monitoring and self-regulating actions.

Chronic impairment in one or more of the six clusters contributes to what Brown calls “ADD syndrome,” the consequence of which show up as significant behavioural symptoms that contribute to a diagnosis of ADHD. So how do we best assess whether these areas or clusters are working well in children? We turn now to a discussion on assessing EF in children and adolescents.

How are problems with executive functioning identified?

As is clear from above, executive function processes constitute a complex, multidimensional construct and assessing EF, especially in children, is a challenging task. Just a couple of factors that can skew results are that individuals’ results on EF assessments may vary due to their anxiety level or they may perform well on tasks in an assessment setting but not when faced with similar tasks in the real world, especially when novelty is a feature of the situation. Also, it is difficult to parse out one area that is the source of EF difficulty. Currently, there is no agreed upon assessment that measures all of the different features of executive functioning. Our challenge is to replace discrete, isolated tasks with multidimensional tasks that assess the student’s ability to integrate multiple processes in open-ended situations, to organize and narrow broad tasks into manageable chunks, and to work independently on self-imposed goals.

Two widely used standardized test batteries include The *Developmental Neuropsychological Assessment Second Edition* (NEPSY-II; Korkman, Kirk, & Kemp, 2007; PsychCorp) and the *Delis-Kaplan Executive Function System* (D-KEFS; Delis, Kaplan, & Kramer, 2001; PsychCorp). The NEPSY-II and D-KEFS each comprise several tasks that assess various executive function processes, including selective attention, working memory, planning, organization, and cognitive flexibility. However, as Dawson and Guare (2010) have pointed out, “Standardized tests do not assess critical EF processes, and the more we try to measure EF processes through discrete clinical tasks, the less we evaluate actual EF processes and the less we can generalize these results to real-life situations.” A frequent observation in the clinical setting is that even the most complex clinical task, in the end, is far less complex than typical situations

in the real world that place demands on the EF processes of individuals.

In view of the limited ecological validity of brief standardized tests for assessing EF processes, alternative methods of evaluation are being explored. A combination of clinical tests and ecologically-valid behaviour rating scales is currently considered the best method of assessing EF processes. The clinical criteria are similar to those used for assessing attention-deficit disorders, where agreement among two to three observers across different settings (home, school, and a clinical setting) is considered more reliable than individual-administered complex computer assessment systems. One useful rating scale for ages 3 to 90 is The *Behaviour Rating Inventory of Executive Function* (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2002). While the BRIEF provides a reliable and often valid measure of parent, teacher, and self-reports of EF processes, it cannot be the sole measure of such processes and must be interpreted within the context of a multi-dimensional comprehensive neuropsychological evaluation. This includes a direct sampling of students' processing and behaviour as well as detailed developmental and educational histories and student work samples.

What are some strategies that can help children with EF impairment?

The following strategies may be helpful in supporting the specific area of executive function where weaknesses are identified.

Classroom management and teaching strategies

A well-organized, structured environment with clear routine, rules and procedures, minimal distractions, allocated seating arrangements, teacher use of hand gestures, visual aids, frequent feedback and checklists are all effective strategies for maintaining external control (Wicks-Nelson & Israel, 2009; Heward, 2009; McCloskey, 2008). General classroom strategies include paired learning, modified assignments, testing and grading, provision of support and – where appropriate – the use of technology. Furthermore, students may work more effectively in an environment where there is variety, choice, regular feedback, praise and rewards. When structures are in place and students have self-regulation strategies to manage emotional challenges (such as frustration, anxiety and intolerance), they are more able to access their cognitive resources.

Additional teaching strategies may include:

Planning: explicit teaching of the planning process, breaking tasks into manageable steps and teaching students how to use a planner/organizer.

Prioritizing: teaching students how to highlight main points, using visual learning aids and supports such as graphic organizers as well as allocating time frames to specific tasks.

Organizing: guided practice, consistent routine, using outlines such as graphic organizers, teaching summarizing skills and note-taking strategies, putting key points on index cards or 'post-it' notes, using colour coding for organizing tasks, and using files, binders, trays, and boxes to organize the environment and reduce clutter.

Shifting: shifting of activities and focus can be supported through ensuring eye contact

and attention before giving clear instructions, advance warning of changes, use of predictable routines, and opportunities for small-group work where group roles (leader, note taker, focuser) are clear to each student.

Working Memory: reduce working memory demands by the use of a planner/diary and wall calendars to help with day-day management tasks, implementing a well-structured daily schedule and visual aids to provide reminders for routine and applied strategies. Students should be encouraged to use self-talk to remember steps and guide their actions. For learning, using repetition, acronyms, mnemonics, chunking, attaching meaning, reciting/singing, and recording. To assist with deficits in internalization of verbal working memory, visual cues can be linked to verbal prompts. Visual working memory deficits should be supported by adding verbal explanations to visual materials and demonstrations.

Self-monitoring can be managed via aids such as self-assessments, self-recording, clearly defined rubrics, exemplars, feedback, checklists and reinforcers (Heward, 2009; Meltzer, 2010; McKloskey, 2008).

Behavioural intervention strategies

Students with EF deficits may struggle with emotional and behavioural control. The value and efficacy of behavioural and academic interventions have been well documented, and school focused interventions have been found to be superior to a singular behavioural management approach. Evidence-based behaviour strategies for EF difficulties include creating clear rules and procedures (and enforcing them consistently), providing encouragement, rewards and praise, teaching and modeling modulation and supporting positive self-reflection and self-talk about tasks and achievements (Heward, 2009; Sherman, 2008; Wicks-Nelson & Israel, 2009) can be very successful. Concomitantly, Graham-Day, Gardner, and Hsin, (2010) state that, “simply making students aware of and accountable for their behaviour also teaches an important life skill.”

Additionally, successful school intervention strategies to increase appropriate classroom behaviour include knowing students’ weaknesses, equipping them with skills to help them manage situations, and offering coaching and support when needed. Finally, strategies that include social skill instruction, social stories, de-stressing and relaxation strategies, opportunities for role-play, differential reinforcement, metacognitive strategies such as self-monitoring strategies, and self-evaluation aligned with positive behaviour reinforcers (Gureasko-Moore, DuPaul & White, 2007; Menzies, Lane & Lee, 2009) have been found to successfully address EF impairments.

Although the area of EF may be new to many school psychologists, it holds great promise as a framework for assessing student difficulties and enhancing student success, especially those with attentional disorders.

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Additional Resources

Executive Function in Education: From Theory to Practice, editor, Lynn Meltzer

National Center for Learning Disabilities, <http://www.nclld.org/ld-basics/ld-aamp-executive-functioning/basic-ef-facts/executive-function-fact-sheet>

Center for Research on Learning, Strategies Intervention Model, http://www.specialconnections.ku.edu/cgi-bin/cgiwrap/speconn/searchabledb/moreinfo.php?desc_id=154

Tools of the Mind, <http://www.devcogneuro.com/research.html#ongoing>

Language, Speech and Hearing Services in Schools, Vol. 30, 265-274, “What Are Executive Functions and Self-Regulation and What Do They Have to Do with Language-Learning Disorders?”,

<http://www.architectsforlearning.com/sitebuildercontent/sitebuilderfiles/singerbashir1999.pdf>