Executive Functioning and Language

What are Executive Functions?
According to Dawson and Guare (2010), Executive function refers to “high-level cognitive processes required to plan and direct activities, including task initiation and follow-through, working memory, sustained attention, performance monitoring, inhibition of impulses, and goal-directed behavior (p. vii).”

Core executive function skills:
- Working Memory
- Inhibition
- Planning
- Cognitive Flexibility
- Self-Regulation

Executive function can be divided into 2 categories – meta-cognition (which includes meta-linguistics) and behavioral regulation.

EF skills predict academic success more effectively than tests of academic achievement or cognitive ability.

Children with poor EF skills are at high risk for dropping out of school.

Children with poor EF skills are also at high risk for social/behavioral problems.

Generally associated with frontal systems, specifically the pre-frontal cortex

Students use EF Skills when: (Howland, 2010)
- Diamond (2006): When “going on automatic” would lead one astray.
- When a new skill is being learned; until that skill becomes automatized.
- To complete tasks that demand integration and coordination of multiple skills.

Research on Language and EFs:
Hungerford and Gonyo (2007) looked at scores on the Behavior Rating Inventory of Executive Function (BRIEF) to see if they predicted scores on the CELF-4 for students referred for language testing. They found that the BRIEF predicted working memory, receptive language, language content, and core language scores on the CELF-4. They didn’t find that it predicted expressive language; however, the researchers thought that it wasn’t predicted because the CELF-4 looked primarily at language at the sentence level, and limited executive functions were needed at that level. Singer and Bashir (1999) reported that, “Metacognitive strategies, by and large, consist of routines that are mediated with language (p. 267).” In their case study with George, they found that teaching him executive functioning strategies, his language skills grammatical structure and cohesive ties improved without direct intervention.
To learn more about EFs in adolescents with SLI, Hughes, Turkstra, and Wulfeck (2008) administered the BRIEF-SR to adolescents with and without SLI, and compared scores between these two groups and also to parents’ scores on the BRIEF Parent-Report Form. Results showed that parent and self-ratings of EF problems in everyday life were significantly higher for adolescents with SLI (i.e., indicating more problems) than for peers matched for age, sex, and race. In addition, in the SLI group, 57% of parent ratings were in the clinically impaired range, compared to 10% in the typical group.

Further, anecdotal comments from parents of adolescents with SLI revealed that EF-related problems were their main concern; worries about their children’s ability to use communication skills effectively in social interactions, live independently, and obtain competitive employment far outnumbered their concerns about formal language skills. Although there continues to be debate about the underlying basis of EF problems in adolescents with language impairments (Booth, Boyle, & Kelly, 2010), these data suggest that EFs should be considered in intervention planning for this group.

Results suggest that SLI children: (Tropper, B. et al., 2008).
- Have more difficulty controlling behavioral responses under high levels of conflict
- Are poorer in monitoring/detecting conflict.
- High frequency of perseveration;
- Weak resistance to interference;
- Problems with expelling unnecessary material from working memory.
- Impaired selective attention abilities, resulting in less efficient language processing in the presence of distraction.

Executive function skills, not language skills predicted social skills for students with language impairments. (Hungerford, Call-Morin, Bassendowski, and Whitford, 2009)

**Intervention Skills: What to Target**

**Pre-School-1st grade**
- Inhibition
- Planning through Play/Center Times

**2nd-5th grade**
- Develop Strategy Use
- Graphic Organizers
- Self-Regulation of Attention

**Middle School and High School**
- Independent and Flexible Strategy Use
- Planning/prioritizing/Organizing
- Being systematic
- Self-regulation/self-monitoring
- Self-advocacy
Games to Develop Inhibition in Preschoolers (Howland, 2010)

- Duck Duck Goose
- Freeze Tag
- Simon Says (simplify for the younger child, do what the “good puppet” says, not what the “naughty puppet” says).
- Slap (Tap) Jack (we do this with letters)
- Musical Chairs
- Mother May I?

References:


