

EXECUTIVE FUNCTION

A Resource Guide for Speech-Language Pathologists, Teachers, and Parents

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Introduction

Executive Function involves the ability to perform higher level thinking, goal-directed behaviour which often includes strategic planning, flexibility of thought and action, inhibition of inappropriate responses and concurrent remembering and processing (working memory)(Friedman et al., 2006).

Speech-Language Pathologists (S-LP) play an important role in the evaluation and treatment of communication deficits related to executive dysfunction. The contribution of executive function on language seems obvious, however executive function is often not a part of S-LP's evaluation (Turkstra & Byom, 2010).

The purpose of creating this resource guide is to provide important information and resource links to help better understand how to address executive functioning challenges in the classroom and at home. The following guide will help fellow S-LPs, teachers, educational support staff, and parents make sense of what executive function is and how to treat it accordingly.

Friedman, N.P., Miyake, A., Corley, R.P., Young, S.E., Defries, J.C., & Hewitt, J.K. (2006). Not all executive functions are related to intelligence. *Psychological Science*, 17(2), 172-179. <https://doi.org/10.1111/j.1467-9280.2006.01681.x>

Turkstra, L.S. & Byom, L.J. (2010). Executive Functions and Communication in Adolescents. *The ASHA Leader*, 5(15), 8-11. <https://doi.org/10.1044/leader.FTR1.15152010.8>

What is Executive Functioning?

Article:

Diamond, A. (2013). Executive function. Annual Review of Psychology, 64, 135-168.

<https://doi.org/10.1146/annurev-psych-113011-143750>

- This paper addresses:
 - What executive functioning is,
 - The developmental progression and representative measures
 - Controversies involving executive functions
 - The importance of social, emotional, and physical health for cognitive health
 - How executive functions are trainable and can be improved with practice and the intervention methods to consider

Website:

<https://developingchild.harvard.edu/science/key-concepts/executive-function/>

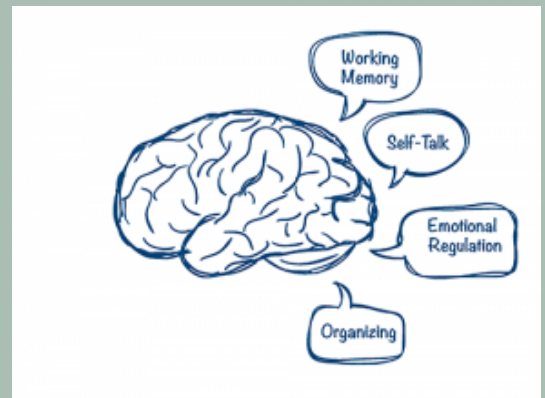
- Harvard University - Center on the Developing Child
 - Overview of Executive Function and Self-Regulation skills
 - What is executive function? What skills are involved?
 - The components of the brain involved in carrying out executive function skills
 - How to build executive function skills
 - Includes an overview video

Website: <https://gogobrain.com/executive-function-challenges/>

- What are executive function challenges?
- Parent-friendly: how to spot executive function challenges in children
 - Ways to strengthen these skills
 - The 8 executive function skills
 - What do executive function challenges look like?
 - How do these issues impact children in the classroom?
 - Strategies to help children with executive function challenges

A video of Adele Diamond explaining her research on executive functions:

https://www.youtube.com/watch?v=8mxjr_pE-DY



THE 8 EXECUTIVE FUNCTION SKILLS

- 1) Impulse control
- 2) Emotional control
- 3) Flexible thinking
- 4) Working memory
- 5) Self-monitoring
- 6) Planning and prioritizing
- 7) Task initiation
- 8) Organization

What is Executive Functioning?

TedTalk:

https://www.ted.com/talks/sabine_doebel_how_your_brain_s_executive_function_works_and_how_to_improve_it?language=en#t-543829

- Sabine Doebel, a cognitive scientist, shares her research and the factors that affect executive function
- She provides many parent-friendly analogies to help understand more challenging concepts

Video: <https://www.youtube.com/watch?v=sZmEISGKBG8>

- Executive function: The brain's control center
 - This video distinguishes between three components:
 - 1) Working memory
 - 2) Inhibitory control
 - 3) Cognitive flexibility

Blog:

<https://www.childnexus.com/blog/article/what-is-executive-functioning-5b386114d4a22>

- ChildNEXUS - What is Executive Functioning?
 - What specific skills does executive function include?
 - Co-existing disorders or deficits
 - What components of the brain are involved in these higher order skills?
 - Includes a list of recommended readings for parents

Infographic:

<https://developingchild.harvard.edu/resources/what-is-executive-function-and-how-does-it-relate-to-child-development/>

Recommended Readings for Parents

"Executive Functions: What They Are, How They Work, and Why They Evolved" by Russell A. Barkley (2012).

"Executive Skills in Children and Adolescents: A Practical Guide to Assessment and Intervention" by Peg Dawson and Richard Guare (2004).

"Late, Lost, and Unprepared: A Parents' Guide to Helping Children with Executive Functioning" by Joyce Cooper-Kahn and Laurie Dietzel (2008).

"Outside the Box Rethinking ADD/ADHD in Children and Adults A Practical Guide" by Thomas E. Brown (2017).

"Smart but Scattered: The Revolutionary 'Executive Skills' Approach to Helping Kids Reach Their Potential" by Peg Dawson and Richard Guare (2009).

"7 Executive Function Deficits Tied to ADHD" - <https://www.additudemag.com/7-executive-function-deficits-linked-to-adhd/>

How do I assess a child with executive function difficulties?

Test: The Executive Functions Test-Elementary (EFT-E)

<https://www.smartspeechtherapy.com/the-executive-functions-test-elementary-what-slp-and-parents-need-to-know/>

- The EFT-E is a test of language skills that affect executive functions of working memory, problem solving, inferring, predicting outcomes, and shifting tasks.
- 4 Subtests:
 - 1) Attention and Immediate Memory-Auditory
 - 2) Attention and Immediate Memory - Auditory and Visual
 - 3) Working Memory and Flexible Thinking
 - 4) Shifting
- This test allows S-LPs to identify students with weaknesses in vocabulary and use, memory, sustained attention, discourse formulation, inferencing and problem solving, recall of key information in text and messages, self-regulation, context-clue identification, categorization, set-shifting, social pragmatics.



Rating Instrument: Childhood Executive Functioning Inventory (CHEXI)

<http://www.chexi.se/>

- CHEXI includes 4 different subscales including: inhibition, working memory, regulation, and planning
- Can be completed by both parents and teachers
- Measures executive functioning in children between 4-12 years of age
- There is an adult version (ADEXI)
- Freely available in multiple languages



How to assess a child with executive function difficulties?

Questionnaire: Executive Skills Questionnaire (Peg Dawson & Richard Guare)

<https://nyspta.org/wp-content/uploads/2017/08/Conv17-305-dawson-executive-skills-questionnaire.pdf>

- A good questionnaire to have adolescent students complete to identify areas of strengths and weaknesses in regard to executive function skills
- Includes a checklist for designing interventions
- Provides a chart on environmental modifications and teaching strategies for specific executive skills

Rating Scale: Learning, Executive and Attention Functioning (LEAF) Scale

<https://drk.sitehost.iu.edu/LEAFinfo.html>

- The LEAF is a 55 item parent, teacher, or self-report questionnaire that assesses executive functions, related neurocognitive functions, and academic skills in children and adults

Questionnaire: Behaviour Rating Inventory of Executive Function (BRIEF)

<https://www.parinc.com/Products/Pkey/23>

- Assesses executive function behaviours in the school and home environment
- Developed for parents and teachers of school-aged children
- 8 clinical scales: inhibit, shift, emotional control, initiate, working memory, plan/organize, organization of materials, monitor



How to intervene effectively with children with executive function challenges?

Website: Standard Interventions for Executive Function

https://www.d181.org/uploaded/Parents/Family_Education_Events/STANDARD_INTERVENTIONS_FOR_EXECUTIVE_FUNCTION.pdf

- List of interventions that target different executive skills
- Highlights a general framework that can be utilized while working on specific executive skills: Goal-Plan-Do-Review System ((Ylvisaker, Szekeres, & Feeney, 1998).
 - Includes a worksheet for GOAL-PLAN-DO-REVIEW framework

Website: <https://childmind.org/article/helping-kids-who-struggle-with-executive-functions/>

- Provides parent and teacher friendly strategies to implement at home and school
 - The strategies include: checklists, setting time limits, spelling out the rationale, exploring different ways of learning, establishing routines, using rewards

Modules: Modules for Executive Functioning

<https://www.uhs.wisc.edu/wp-content/uploads/modules-for-executive-functioning.pdf>

- These modules focus on increasing the children's self-awareness and improving their ability to pay attention and focus which are related to the skills of executive functioning.
- Includes specific cognitive behavioural and mindfulness strategies



How to intervene effectively with children with executive function challenges?

Blog: 5 Tips on Building an Executive Function Toolbox <https://blog.brookespublishing.com/5-tips-on-building-an-executive-function-toolbox-for-your-learners/>

- Adapted from the "Multisensory teaching of Basic Language Skills Fourth Edition" by Judith R. Birsh & Suzanne Carreker
- Provides 5 tools to promote children's cognitive flexibility, social-emotional skills, self-regulation, and working memory
 - Tool 1: Make use of varied learning modalities
 - Tool 2: Emphasize "portable" academic skills
 - Tool 3: Give students the language they need to self-regulate
 - Tool 4: Teach students how to build social emotional skills
 - Tool 5: Facilitate working memory functions

Website:

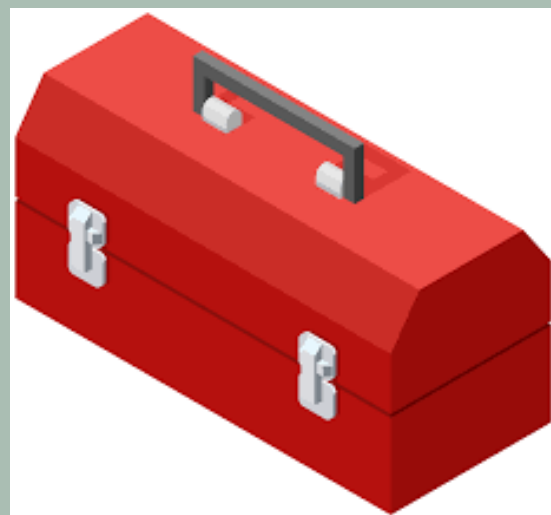
<https://www.smartkidswithld.org/getting-help/executive-function-disorder/principles-for-improving-executive-skills/>

- Highlights key principles to guide parents and teachers to improve important executive skills

TIPS FOR PARENTS

Websites:

1. <https://www.aetonline.org/index.php/parents/tips-for-parents>
2. <http://www.davidsongifted.org/search-database/entry/a10822>



How to intervene effectively with children with executive function challenges?

Checklist:

<https://www.additudemag.com/download/executive-function-worksheet/>

- A parent-friendly checklist of executive function challenges
- Parents can check off interventions that they think have been effective and talk over the strategies with the child's teacher

Manual: Executive Function 101 (The National Center for Learning Disabilities)

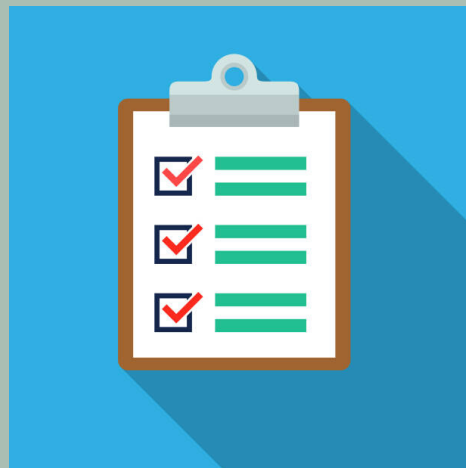
<https://www.understood.org/~/media/040bfb1894284d019bf78ac01a5f1513.pdf>

- Defines executive function
- Provides a checklist that parents or teachers can use to recognize executive function difficulties in their student/child
- Provides tasks that focus on the different executive functioning skills

Manual: Executive Functioning and Cognitive Control (Joseph Falkner, MST/CCC-SLP)

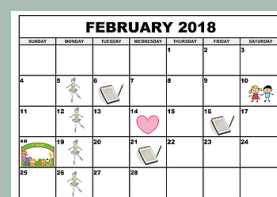
https://www.flexiblemindtherapy.com/uploads/6/5/5/2/65520823/executive_functioning_and_cognitive_control_manual.pdf

- This manual includes an extensive background on executive functioning including theories, definitions and resources.
- The resources included in the manual will help S-LPs with assessing (assessments, checklists, etc.) executive function challenges
- Includes a list of speech therapy software, apps, games, assistive technology, alternative approaches, and helpful websites



Tips for Planning and Organizing:

1. Picture Calendar



2. Agenda



3. Behavioural Tracking

4. Use Timers



5. Reward System

6. Movement Breaks



Activities

APPS

https://www.neurodevelop.com/APPS_for_Executive_Functioning

- Includes information on the following apps:
 - Mindjet Mapping
 - Evernote
 - Evernote Peek
 - WritePad
 - IdeaSketch

<https://www.beyondbooksmart.com/executive-functioning-strategies-blog/the-top-3-executive-function-apps-in-my-coaching-toolbox>

- Google Keep
- ToDoist
- Habit List

<https://www.beyondbooksmart.com/executive-functioning-strategies-blog/5-great-apps-for-improving-executive-functioning-in-children>

- Planning: 30/30
- Working memory app: Quizlet
- Organization app: YouNote!
- Organization app: Google Calendar
- Time Management app: InClass

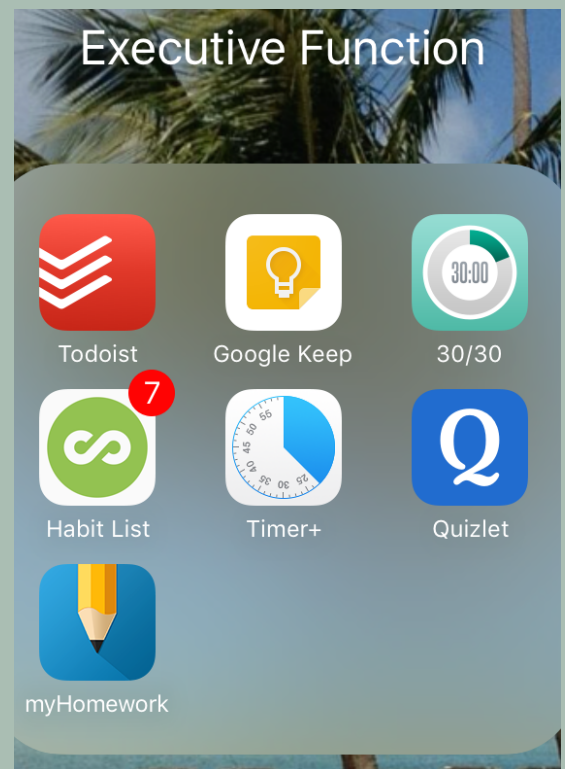
https://chadd.org/wp-content/uploads/2018/06/ATTN_12_14_APPSforEFChallenges.pdf

- Things to consider when selecting apps to assist executive function challenges

Activity Guide: Enhancing and Practicing Executive Function Skills with Children from Infancy to Adolescence

<https://developingchild.harvard.edu/resources/activities-guide-enhancing-and-practicing-executive-function-skills-with-children-from-infancy-to-adolescence/>

- Describes a variety of activities and games that represent age appropriate ways for adults to support and strengthen various executive function skills



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