Executive Functioning

More Than Just Attention

Tera Sumpter, M.A., CCC–SLP

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SLP & BUSINESS OWNER

14 years experience in speech-language pathology
Growing Cleveland area private practice--Seeds of
Learning LLC--with two locations

AUTHOR & COMMUNITY ADVOCATE

Author of: *Seeds of Learning: A Cognitive Processing Model for Speech, Language, Literacy, and Executive Functioning*
Host and instructor for Seeds of Learning Mighty Networks Community

Who am I?

TERA SUMPTER

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Background as medical SLP

Taught A&P at CSU

Mom to the world's best kids

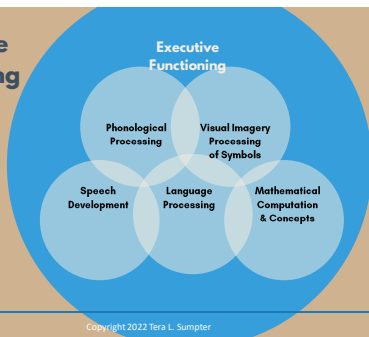Copyright 2022 Tera L. Sumpter

Neuroplasticity & Metaplasticity

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My Goal for Today...

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Cognitive Processing Model

Executive Functioning

Phonological Processing

Visual Imagery Processing of Symbols

Speech Development

Language Processing

Mathematical Computation & Concepts

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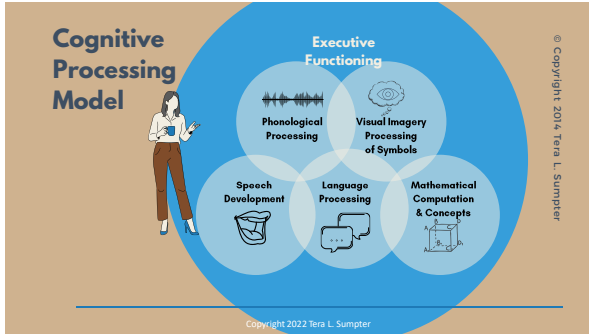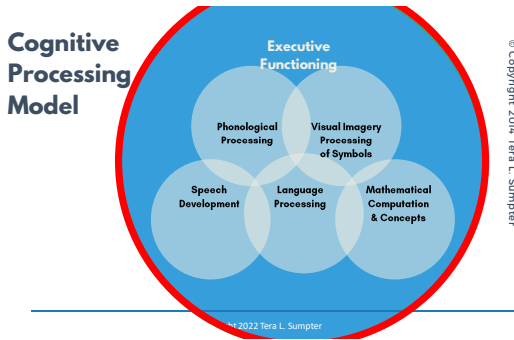
Executive Functions

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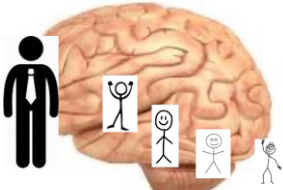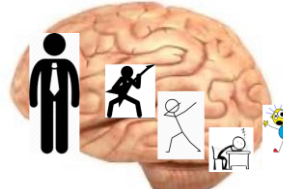

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Executive Function Skill Clusters (McCloskey 2015)

ATTENTION	OPTIMIZATION	INQUIRY	ENGAGEMENT
Perceive	Monitor	Anticipate	Energize
Focus	Modulate	Guage	Initiate
Sustain	Balance	Analyze	Inhibit
	Correct	Estimate time	Stop
		Compare	Pause
			Flexible
			Shift

EFFICIENCY	MEMORY	SOLUTION
Sense time	Hold	Generate
Pace	Manipulate	Associate
Sequence	Store	Prioritize
Execute	Retrieve	Plan
		Organize
		Decide
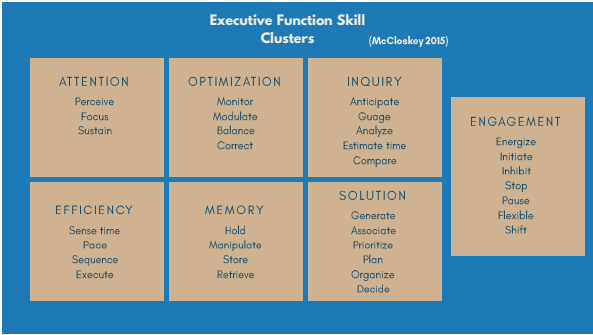
Attention

Perceive
Focus
Sustain

Engagement

Energize
Initiate
Inhibit
Stop
Pause
Flexible
Shift

Optimization

Monitor
Modulate
Balance
Correct

Efficiency

Sense time
Pace
Sequence
Execute

Memory

Hold
Manipulate
Store
Retrieve

Working Memory: Baddeley & Hitch's Model

Phonological Loop

Verbal working memory
Self-talk/Inner Voice

*ability to hold sounds in our mind

Visuospatial Sketchpad

Non-verbal working memory
Mind's eye/imagination

*ability to hold symbols & pictures in our mind

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Working Memory: LANGUAGE APPLICATION

EX:
Drage

VERBAL

PHONOLOGY

sounds
words
phrases
sentences

NONVERBAL

SEMANTICS

meaning
concepts
ideas

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Working Memory Deficits We See in Language

VERBAL

- Difficulty with word recall
- Difficulty with phonological processing/phonemic awareness
- Difficulty remembering words: "I know what it is but I just can't think of the word!"
- Difficulty following directions

NONVERBAL

- Difficulty with comprehension
- Difficulty remembering events and information
- Difficulty generating novel ideas
- Difficulty with thought organization
- Difficulty following directions

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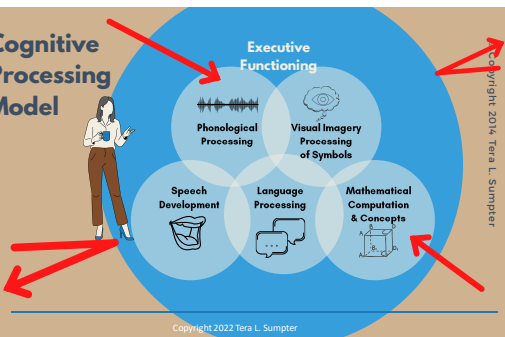
Inquiry

Anticipate
Gauge
Analyze
Compare/Contrast

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Solution

Generate
Associate
Prioritize
Plan
Organize
Decide

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Cognitive Processing Model

Executive Functioning

Phonological Processing

Visual Imagery Processing of Symbols

Speech Development

Language Processing

Mathematical Computation & Concepts

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PERFORMANCE (producing) DIFFICULTIES

Knowing WHEN vs. knowing how

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Common misconceptions of EF dysfunction

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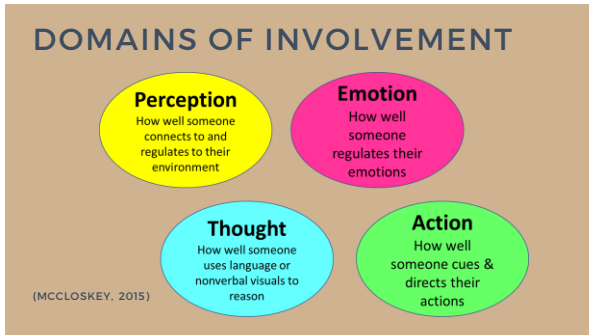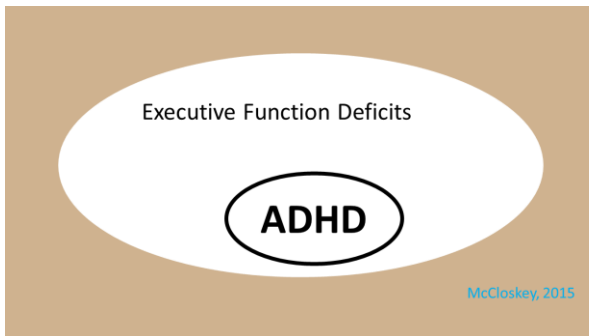**SOCIAL PRAGMATICS**

- PERCEPTION
- FOCUS
- ATTENTION
- INHIBITION
- SELF-MONITORING
- WORKING MEMORY

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DOMAINS OF INVOLVEMENT

Perception
How well someone connects to and regulates to their environment

Emotion
How well someone regulates their emotions

Thought
How well someone uses language or nonverbal visuals to reason

Action
How well someone cues & directs their actions

(MCCLOSKEY, 2015)

Executive Function Deficits

ADHD

McCloskey, 2015

EXECUTIVE FUNCTIONING CONTROL
is slow, effortful,
not automatic
**and requires a lot**
of energy to activate!

ASSESSMENT

MUST BE DYNAMIC

"Barkely (2012b) has offered a multipronged critique of psychometric tests as measures of executive functioning. He points out that these tests have been shown to have only low to moderate reliability." -Dawson & Guare, 2018

"Best practice in the assessment of executive function must extend beyond the use of formal standardized measures."
-Dawson & Guare, 2018
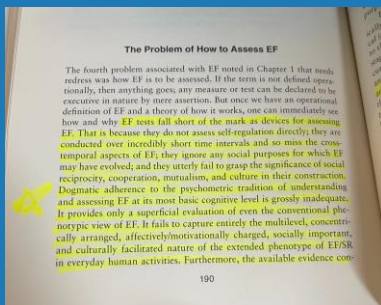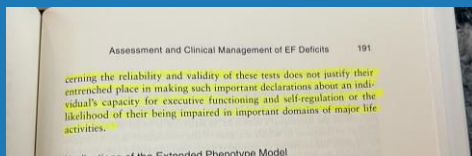
Executive Functions: What They Are, How They Work, and Why They Evolved. Russell A. Barkley. 2012

FORMAL MEASURES

- PSYCHOMETRIC EVALUATIONS
- PARENT/TEACHER/SELF-REPORT RATING SCALES SUCH AS THE MEFS, BRIEF, CEFI

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INFORMAL MEASURES

- CASE HISTORY
- INTERVIEW
- OBSERVATION: Patterns of Processing
- PARENT/TEACHER QUESTIONNAIRES
- WORK SAMPLES
- EF TASKS (ALPHABETIZING, CROSSING OUT)

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INCONSISTENCY

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Receptive/Expressive language inversion
- EF heads up!

Executive functioning is required for every test.

The CELF-5 Through an EF Lens

Word Classes
- can't retain 4 words (verbal working memory demand)
- doesn't know vocabulary
- can't determine relationship between words (nonveral working memory)

Formulated Sentences
- Difficulty holding onto word and manipulating words to create sentence (working memory demand)

The CELF-5 Through an EF Lens

<u>Recalling Sentences</u>
- Verbal working memory demand
- Replaces words with synonym (using nonverbal working memory)

<u>Understanding Spoken Paragraphs</u>
- High EF demand: sustained attention & working memory

If we are not assessing EF, then we must support EF during the assessment process.

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Student A

- "in his own world"
- unaware of his mother when she talks to him.
- parents were concerned early on that he might be deaf since he didn't respond to his name or other verbalizations.
- does not observe other children when they are playing or communicating.
- happy to be left alone to do his own thing.
- speech and language are both significantly delayed.

Student B

- happy, curious little boy
- loves playing with toys and exploring his yard
- typically plays with one toy for just a few minutes before moving onto the next one
- only completes one of several given directives
- often lost and does not understand the tasks that need to be completed at school
- teacher has to repeat directions multiple times
- spends most of the time looking around the room or playing with his shoe during story time
- often doesn't remember the story once it's finished

Student C

- Teacher reports:
  - Inconsistent performance
  - Lazy, needs to try harder on work
  - Doesn't following directions
  - Turns in poorly completed work with lots of mistakes
- CELF-5 results: WNL on all subtests except USP (below average)
- Reading accuracy: below average
  - Read very quickly, unaware of mistakes, did not fix any errors
  - Been in reading intervention for years
- Reading comprehension: below average
- Been in speech therapy for years due to poor generalization

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Female, 8-yo: narrating Buddy story

WHAT CAN WE DO?

- INCREASE AWARENESS
- VISUALIZE
- PLAN
- SELF-EVALUATE

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INCREASE AWARENESS

1

we cannot change that of which are unaware, nor can we repeat what we've done well if we are not aware of how we accomplished it in the first place.

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EX

Respond to the child's response

Guide with questions

Increase awareness to performance

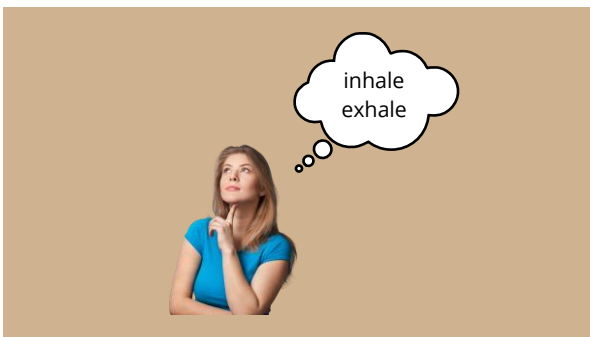**Reflexive Questioning**

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What are your thoughts?
Where should your thoughts be?
Is that what you should be doing?
What should you be doing right now?
Is that important right now?

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How did you do that?

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exhale

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Reflexive Questioning Example

Speech Target /g/. Child says **/d/.**

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Target word:
"splet"

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Target word:
"drays"

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Target sentence:
"She went to the
park."

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Target sentence:
"She took her
dog with her."

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Reflexive Questioning
- **Active vs. passive learning**
- **meet them where they are:** dinner visitor

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VISUALIZE

2

The brain's ability to create mental representations is the foundation for oral and written language comprehension and executive functioning

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Visualization

NONVERBAL WORKING MEMORY

INTERNAL MAP OF THE EXTERNAL WORLD

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Development of the Time Horizon

How Far into the Future can they Anticipate?

2 Years Old: *NOW*
3-5 Years Old: 5-20 Min
K- 1st Grade: Several Hours
3rd -6th Grade: 8-12 Hours
6th-12th Grade Years : 2-3 Days
17-23 Years Old : 2-3 Weeks
23-35 Years Old: 3-5 Weeks

FROM SARAH WARD

Ways to Stimulate Imagery for Comprehension

- Ask the kids to draw a picture of how they imagined a scene from the story
- Tell kids that their imaginations can make better movies than any film maker!
- For story recall: review the pictures that you all saw in your imagination. First we saw Sahara eat breakfast. Then we saw Sahara go to school. Last we saw Sahara go to bed.

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Use Imagery-Rich Language

- *Your words make me picture this. Does that match? Is that what you want me to picture?*
- *When you said that the boy was wearing an oversized shirt, that gave me a great picture in my imagination!*
- *Boys and Girls, as we read the story together, what do you see yourselves doing as I read? "Making a movie in our mind!"*

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Set the Stage for Imagery

"We're going to read a story. Everyone put on their imagination hats! We're going to make a movie in our imagination as we read."

Ask Imagery-Based Recall Questions

- *What did the main character look like in your mind?*
- *What did you see him do first?*
- *What did the scene look like in your imagination?*
- *In your mind, what color was the boy's hair?*
- *What color did you picture the dog?*
- *Show me with your hands how big you pictured the rabbit.*
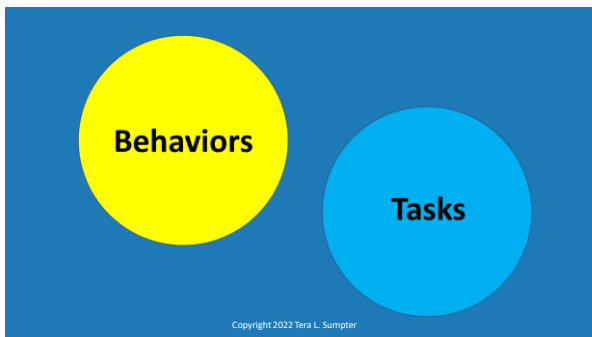
MAKE A PLAN

3

Children with executive functioning deficits may not know how or when to initiate and execute particular plans of action.

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Now, It's Your Turn

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Behaviors

Tasks

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Behaviors

- Plan for Wanting to Touch/Take Something
- Plan for Thinking of an Answer
- Plan for Listening
- Plan for Looking
- Plan for Talking in the Classroom
- Plan for Conversational Turn Taking

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Tasks

- Plan for Completing a Worksheet
- Plan for Using Planner
- Plan for playing Uno
- Plan for reading a word
- Plan for any classroom assignment or therapy activity

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- Go left to right (can start with a tracking plan, if needed)
- Touch each word and say word
- Keep going until you see a period
- Take a breath at the period
- Repeat steps 1-4 until finished

Plan for Reading a Sentence or Story

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- Read one sentence.
- Stop at the period.
- At the period, make a picture in my imagination that matches the sentence.
- Reread sentence, if needed.

Plan for Reading Comprehension

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Plan for Listening

1. Thoughts on the speaker's words

Plan for Thinking of an Answer

1. Look in my brain for the answer
2. Ask myself, "Is this the right answer?"
3. "Yes" - say answer
   "No" - repeat steps 1, 2, 3, 4

SELF-EVALUATION

4

Success requires learning from our mistakes and creating a new plan for the future.

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Did I use my plan?

Did I follow my plan?

Did my plan work well?

What was my accuracy?

What was my rate?

Do I need to adjust anything?

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Putting It All Together

1. Create plan
2. Visualize plan
3. Execute plan
4. Self-Evaluate plan
*Reflexively question everything!

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Kiddo Case 1
C.A.: 8
Grade: 3rd

Parent Report:
- Hardworking
- Information doesn't "stick"
- Trouble remembering things
- Struggling in all aspects of school

Clinical Observation:
- Phonemic awareness: difficulty remembering target words
- Difficulty repeating chains at the CV/VC level
- Cannot recall CV/VC chains after 5 second pause
- CELF: asks for repetitions on almost every question. CELF: below average range
- Conversation is choppy

Teacher Report:
- Requires near constant reminding of directions
- Struggling in all academic areas
- Disorganized

Dx: (1) executive functioning impairment characterized by deficits in verbal working memory and (2) language disorder, (3) reading impairment

Sample Goals:
1. Child will repeat with no delay a CV/VC+ chain with 90% accuracy to improve phonological processing/verbal working memory for executive functioning and language.
2. Child will repeat with a 2+ second delay a CV/VC+ chain with 90% accuracy to improve phonological processing/verbal working memory for executive functioning and language.
3. Child will identify the order and identity of sounds in a CV/VC syllable with 90% accuracy to improve phonological processing/verbal working memory for executive functioning and language.
4. Child will manipulate sounds in a CV/VC syllable with 90% accuracy to improve phonological processing/verbal working memory for executive functioning and language.
5. Child will initiate a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
6. Child will follow a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
7. Child will self-evaluate a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.

Sample Therapy Plan
1. Repeat CV/VC chains (e.g. "say /ip/, /ap/) with no delay
   - Start task by creating a plan for task & visualizing, self-evaluate plan when done
2. Repeat CV/VC chains with 2 second delay
   - Start task by creating a plan for task & visualizing, self-evaluate plan when done
3. Blocks task (from LiPS)
   - Start task by creating a plan for task & visualizing, self-evaluate plan when done

4. Constant reflexive questioning!

*can take data on all 7 goals from these 3 tasks
*if speech errors were present, I would use target speech sounds in above tasks

Kiddo Case 2
C.A.: 12
Grade: 7th

Parent/Teacher Report:
- Rushes through work
- Doesn't catch mistakes
- Poor performance on most tests because he rushes to finish
- Mom reports he has no sense of time

Clinical Observation:
- Reading assessment: below average range. Rate was very fast. Made lots of errors and did not self-monitor.
- Writing assessment: below average content, punctuation and capitalization errors
- Language assessment: borderline

Dx: (1) executive functioning impairment characterized by deficits in self-monitoring, time sense, and pacing

Sample Goals:
1. Child will estimate how long a self-generated plan will take with 90% accuracy to improve his time sense and pacing skills for executive functioning.
2. Child will initiate a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
3. Child will follow a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
4. Child will self-evaluate a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
5. Child will estimate how long a self-generated plan took with 90% accuracy to improve his time sense and pacing skills for executive functioning.

Sample Therapy Plan
1. Card sorting activity
    1. Have student create a plan for the task: write on board
    2. Visualize plan
    3. Ask student to estimate how long they think it will take to complete
    4. Student executes plan. Clinician times child.
    5. Self-evaluate plan
    6. Ask student how long they think it took to complete
    7. Compare original time estimate to final time estimate to actual time
    8. Constant reflexive questioning!

*can take data on all 5 goals from this task

Kiddo Case 3
C.A.: 9-5
Grade: 4th

Parent Report:
• Very active/always in motion
• Difficulty completing homework
• Interrupts frequently
• Very loud

Clinical Observation:
• Poor thought organization
• WNL receptive and expressive language
• Writing sample: ideas very unorganized
• Rushed through all activities
• Lots of off-topic conversation

Teacher Report:
• Needs frequent movement breaks
• Difficulty staying on task
• Doesn't raise hand in class
• Frequently talks over teacher and other kids
• Very bright. Has great ideas, but struggles to complete classwork
• Makes lots of careless mistakes

Dx: executive functioning impairment characterized by deficits in inhibition, self-monitoring and self-correcting

Sample Goals:
1. Child will initiate a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
2. Child will follow a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.
3. Child will self-evaluate a 2-3 step concrete plan with 90% accuracy to improve his executive functioning skills.

Sample Therapy Plan
1. Introduce planning & visualization
2. Target main concerns through planning:
   • Inhibiting off-topic conversation
   • Self-regulation of hands/touching/taking
   • Self-modulation of loudness level
3. Reflexively question constantly

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For Inhibiting Touching & Taking Items

1. Create a plan for touching and taking
   1. Keep hands folded/keep hands inside square on table
   2. If I want to touch something, ask Ms. Tera
   3. If Ms. Tera says yes, I can take and touch it
   4. If Ms. Tera says no, keep hands folded/inside square
2. Visualize plan
3. Practice/Role Play
4. Provide feedback with reflexive questions
5. Self-evaluate

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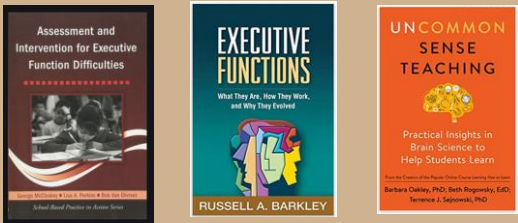**For self-modulating loudness level**

1. Introduce planning & visualization
2. Create a plan for self-modulating loudness level
   1. Quiet voice (library): blue & discuss feeling
   2. Middle voice (most settings): green & discuss feeling/tension
   3. Loud voice (outdoor): red & discuss feeling/tension
3. Visualize plan
4. Practice/Role Play
5. Provide feedback with reflexive questions
6. Self-evaluate

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Group Therapy Session

1. Choose activity for the session that meets the needs of the group
2. Make a plan for that activity before executing
    1. Clinician can make the plan
    2. One student can make the plan
    3. Each student can make one step of the plan
    4. Each student can make their own plan
3. Visualize Plan
• Work all of your speech and language goals here during description
4. Execute activity
5. Self-evaluate
    1. How well did the plan work?
    2. Did Samira's plan work?
    3. Did George have a better plan than Sammy? If so, why?
6. Constant reflexive questioning!

Favorite Books

Assessment and Intervention for Executive Function Difficulties — George McCloskey ◆ Lisa A. Perkins ◆ Bob Van Divner — School-Based Practice in Action Series

EXECUTIVE FUNCTIONS — What They Are, How They Work, and Why They Evolved — RUSSELL A. BARKLEY

UNCOMMON SENSE TEACHING — Practical Insights in Brain Science to Help Students Learn — From the Creators of the Popular Online Course Learning How to Learn — Barbara Oakley, PhD; Beth Rogowsky, EdD; Terrence J. Sejnowski, PhD

Favorite Books

Age of Opportunity — LESSONS FROM THE NEW SCIENCE OF ADOLESCENCE — Laurence Steinberg, Ph.D.

The Seeds of Learning — A Cognitive Processing Model for Speech, Language, Literacy, and Executive Functioning — Tera Sumpter, MA, CCC-SLP

Executive Functioning Educational Community

Seeds of Learning

Tara Glickman, SLP
@constellationspeechtherapy

Being a part of Tera's community has been far and away the most impactful continuing education opportunity I have ever experienced.

Brandy N Stork, SLP
@the_emphasis_project

I've never been so captivated, empowered, impassioned, validated, or energized by any other single training in my career. I can not recommend Tera's community, resources, or trainings enough.

- 5+ modules of executive functioning education
- 32+ hours of recorded Office Hours
- Weekly Live Zoom Office Hours
- Resource libraries
- Ongoing mentorship
- Cohort learning with 270+ SLPs, parents, teachers & other allied professionals from all over the world

**For more information and to join:
seeds-of-learning.mn.co**

How to Find Me

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📷 @Terasumpter_slp

📖 Search "Tera Sumpter" on amazon.com

👥 seeds-of-learning.mn.co for more education

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