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University of Missouri

Supporting Executive Functioning Deficits for Students with Autism

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Agenda

- 9:00-10:30: Supporting Executive Functioning
  - Defining and assessing deficits
  - Goal writing and programming for EF

- 10:30-10:45: Break

- 10:45-12:00: Supporting Social Interaction Skills
  - Teaching perspective taking and emotion regulation
  - Self-monitoring and utilizing peers

Defining the Executive Functions

What are the Executive Functions (EF)?

An umbrella construct that includes a collection of functions responsible for **regulating** (guiding, directing and managing) **cognitive, emotional** and **behavioral** functions during an active problem-solving situation (Gioia et al, 2015).

These functions often go unnoticed **unless there are deficits.**

- The ability to accurately adjust your morning commute time and route to accommodate new knowledge that freezing rain and three inches of snow fell on the roads overnight. (C)

- The ability to select an appropriate emotional reaction to constructive feedback provided by your supervisor. (E)

- The ability to NOT say the first thing that comes to your mind when Aunt Meg asks what you thought of her lime Jello, carrot, walnut and mayonnaise salad. (B)

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EF Domains

Cognitive Regulation Domain: ability to control and manage thinking/decision processes and problem solve effectively

Emotional Regulation Domain: ability to regulate emotional responses, including in response to changing situations

Behavior Regulation Domain: ability to regulate and monitor behavior effectively

EF Cognitive Domain

- *Initiation:* ability to begin a task or activity and to independently generate ideas, responses, or problem-solving strategies.

- *Working Memory*: capacity to hold information in mind for the purpose of completing a task.

- *Plan/Organize*: ability to manage current and future-oriented task demands.

- *Task-Monitoring:* ability to notice minor errors in work output, and pay attention to detail.

- *Organization of Materials*: ability to impose order on work, play, and storage spaces.

EF Emotional Domain

- *Shift:* ability to move freely from one situation to another and to think flexibly in order to respond appropriately to the situation at hand.

- *Emotional Control*: ability to modulate emotional responses by bringing rational thought to bear on feelings.

EF Behavioral Domain

- *Inhibition*: ability to stop one's own behavior at the appropriate time, including stopping actions and thoughts. The flip side of inhibition is impulsivity; if you have weak ability to stop yourself from acting on your impulses, then you are "impulsive."

- *Self-Monitoring:* ability to monitor one's own performance and to measure it against some standard (e.g., people around you; teacher expectations; societal norms) of what is needed or expected.

Identify that EF Deficit

- may blurt things out
- may do unsafe things without thinking it through
- start an activity before listening to instructions
- difficulty staying in line when moving around the school
- interrupting others
- needing more adult supervision and structure

- have difficulty with planning and prioritizing
- difficulty knowing how to start a task
- may come across as procrastinating, but may be overwhelmed
- needs to be told to start a task, even if willing to do it
- ready to start a task, but doesn't know where to begin
- may not take initiative in tasks or homework

Identify that EF Deficit

Inhibit/Inhibition*

- may blurt things out
- may do unsafe things without thinking it through
- start an activity before listening to instructions
- difficulty staying in line when moving around the school
- interrupting others
- needing more adult supervision and structure

Initiation

- have difficulty with planning and prioritizing
- difficulty knowing how to start a task
- may come across as procrastinating, but may be overwhelmed
- needs to be told to start a task, even if willing to do it
- ready to start a task, but doesn't know where to begin
- may not take initiative in tasks or homework

Identify that EF Deficit

- difficulty accepting negative feedback

- may overreact to little injustices

- may struggle to finish a task when something upsets them

- may exhibit outbursts or sudden/frequent mood changes

- tend to be emotionally reactive, with periods of excessive emotional upset

- produces sloppy work

- written work is poorly organized

- makes frequent careless errors

- poor handwriting

- fails to check work for mistakes

- misses math operational signs   (e.g., + , - , x , ÷)

Identify that EF Deficit

Emotional Control

- difficulty accepting negative feedback

- may overreact to little injustices

- may struggle to finish a task when something upsets them

- may exhibit outbursts or sudden/frequent mood changes

- tend to be emotionally reactive, with periods of excessive emotional upset

Task Monitoring

- produces sloppy work

- written work is poorly organized

- makes frequent careless errors

- poor handwriting

- fails to check work for mistakes

- misses math operational signs   (e.g., + , - , x , ÷)

Identify that EF Deficit

- lack self-awareness
- can't tell if their strategies are working
- may be surprised by a bad grade or negative feedback
- difficulty assessing their own performance
- difficulty assessing what works and what doesn't work
- difficulty recognizing and keeping track of the effect their behaviors have on others

- may not know how to plan a project
- may have difficulty seeing the main idea
- may underestimate time to complete a task
- waiting to the last minute to begin a big project
- mixes up the steps involved in a project, or in any multi-step sequence
- loses track of homework assignments

Identify that EF Deficit

Self-Monitoring

- lack self-awareness
- can't tell if their strategies are working
- may be surprised by a bad grade or negative feedback
- difficulty assessing their own performance
- difficulty assessing what works and what doesn't work
- difficulty recognizing and keeping track of the effect their behaviors have on others

Plan/Organize*

- may not know how to plan a project
- may have difficulty seeing the main idea
- may underestimate time to complete a task
- waiting to the last minute to begin a big project
- mixes up the steps involved in a project, or in any multi-step sequence
- loses track of homework assignments

Identify that EF Deficit

- difficulty with multi-step tasks
- difficulty remembering directions, taking notes or understanding something you've just explained
- "I forgot what I was going to say."
- difficulty remembering things (phone numbers, instructions)
- losing track of what they're doing
- forgetting the purpose of an errand
- frequently failing to stick to an activity (poor sustained attention)

- think in very concrete ways
- don't see other options or solutions
- find it difficult to change course in the middle of things
- may become panicky and frustrated when they are interrupted
- difficulty changing tasks, places, difficulty tolerating change (like a substitute teacher, or a change in a planned activity)
- black and white thinking, difficulty letting go of thoughts or ideas

Identify that EF Deficit

Working Memory

- difficulty with multi-step tasks
- difficulty remembering directions, taking notes or understanding something you've just explained
- "I forgot what I was going to say."
- difficulty remembering things (phone numbers, instructions)
- losing track of what they're doing
- forgetting the purpose of an errand
- frequently failing to stick to an activity (poor sustained attention)

Shift*

- think in very concrete ways
- don't see other options or solutions
- find it difficult to change course in the middle of things
- may become panicky and frustrated when they are interrupted
- difficulty changing tasks, places, difficulty tolerating change (like a substitute teacher, or a change in a planned activity)
- black and white thinking, difficulty letting go of thoughts or ideas

School-based Measures of EF

- Behavior Rating Index of Executive Function (BRIEF)

- Child Behavior Checklist (CBCL)

- Behavior Assessment System for Children, Third Edition (BASC-3)

- NEPSYII (Korkman, Kirk, Kemp, 2007)

- Cognitive Assessment System (Naglieri Das, 1997)

School-based Measures

Behavior Rating Index of Executive Function (BRIEF), 2nd Edition:

- Teacher and Parent rating forms
- Provides standardized scores for all Executive Function subdomains
- Most widely used in school settings

Profile of BRIEF®2 T Scores

Note: Male, age-specific norms have been used to generate this profile.
For additional normative information, refer to Appendixes A–C in the BRIEF®2 Professional Manual.
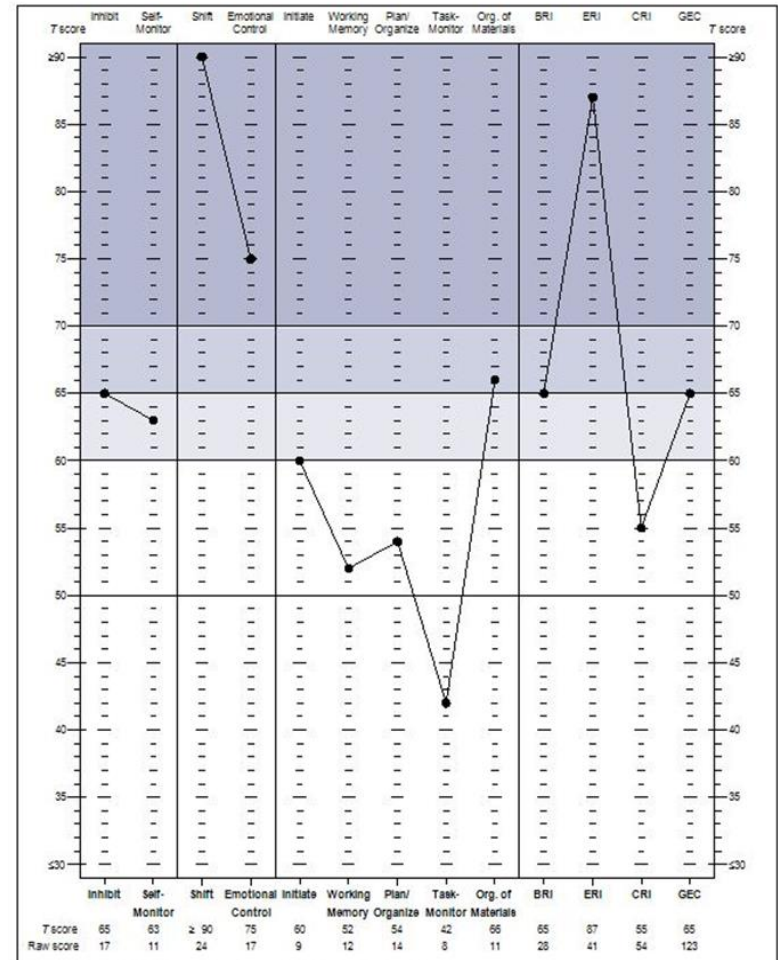
Behavior Rating Inventory of Executive Function, Second Edition®
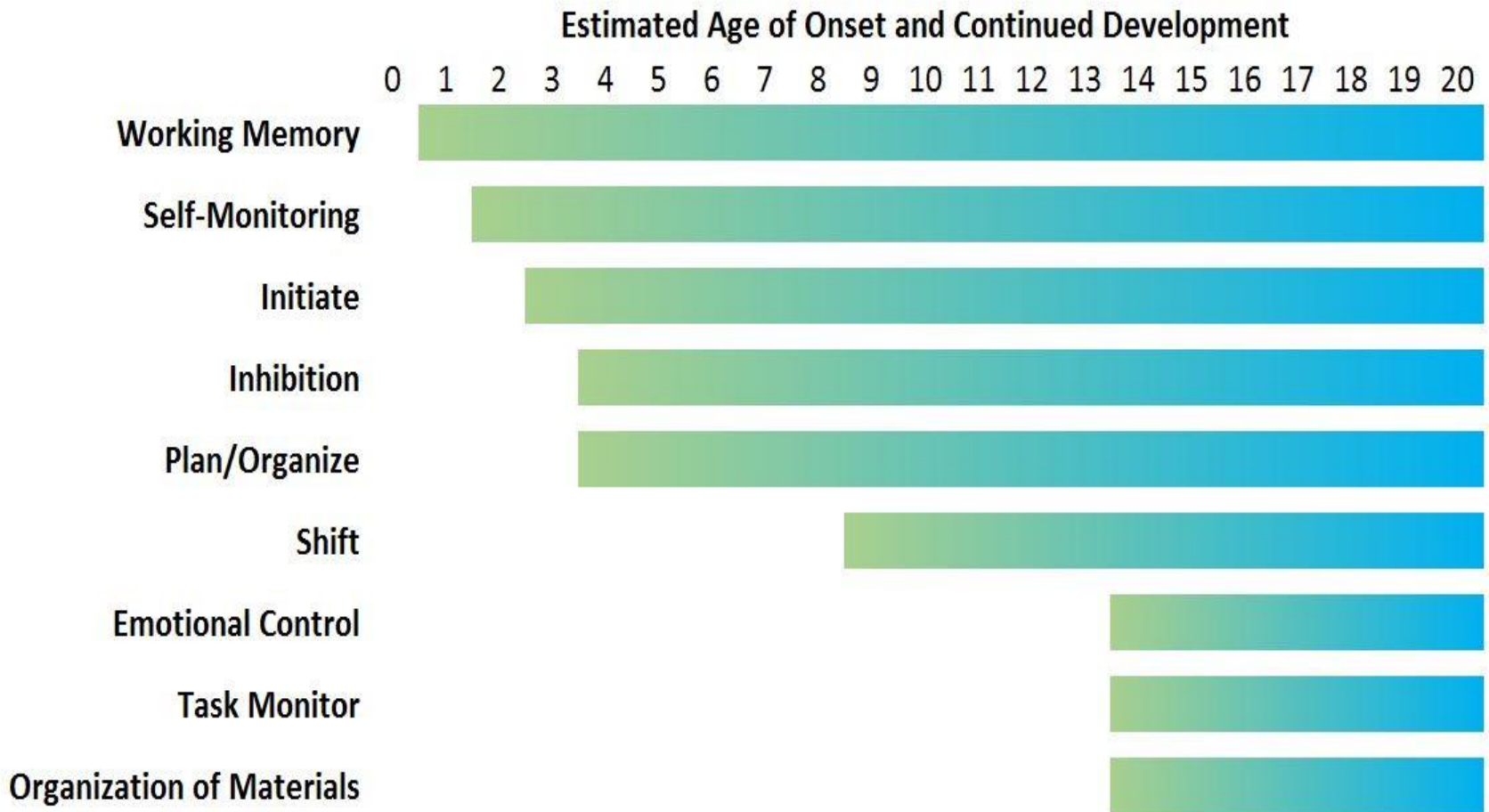
What is a T-score and how is it interpreted?

How do I know which of this student's EF categories are problematic enough to suggest intervention?

BRIEF-2 Results

Behavior Rating Inventory of Executive Function, Second Edition

Index/Scale	T-Score	Range
Global Executive Composite	65	Potentially Clinically Elevated
Behavioral Regulation Index	65	Potentially Clinically Elevated
Inhibit	65	Potentially Clinically Elevated
Self-Monitor	63	Mildly Elevated
Emotion Regulation Index	87	Clinically Elevated
Shift	90	Clinically Elevated
Emotional Control	75	Clinically Elevated
Cognitive Regulation Index	55	Average
Initiate	60	Mildly Elevated
Working Memory	52	Average
Plan/Organize	54	Average
Task-Monitor	42	Average
Organization of Materials	66	Potentially Clinically Elevated

BRIEF-2 Score Categories:

< 59	Average
60-64	Mildly Elevated
65-69	Potentially Clinically Elevated
> 70	Clinically Elevated

Profile of BRIEF®2 T Scores

	Inhibit	Self-Monitor	Shift	Emotional Control	Initiate	Working Memory	Plan/Organize	Task-Monitor	Org. of Materials	BRI	ERI	CRI	GEC
T score	65	63	≥ 90	75	60	52	54	42	66	65	87	55	65
Raw score	17	11	24	17	9	12	14	8	11	28	41	54	123

Note: Male, age-specific norms have been used to generate this profile.
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EF Development through Young Adulthood
(McCalla, 2016)

Estimated Age of Onset and Continued Development

Characteristics of ASD

- Deficits in social communication and interaction
  - Social-emotional reciprocity
  - Nonverbal communication
  - Developing, maintaining and understanding social relationships
- Restricted, repetitive patterns of behavior or interest
  - Stereotyped or repetitive movements, use of objects, or speech
  - Insistence on sameness, inflexible adherence to routines, rituals
  - Highly restricted, fixated interests that are unusual in intensity
  - Intense or absent reactivity to sensory input or sensory environment

EF Deficits in Students with ASD

Executive Function deficits seen in individuals with Autism Spectrum Disorder (ASD) are typically associated with the core symptoms of ASD:

- Impaired social interaction and communication
- Restricted areas of interest
- Repetitive behaviors

While EF deficits in all subdomains have been found in children with ASD, predominant EF deficits were identified in earlier studies related to a need for sameness, a difficulty switching attention, a tendency to perseverate and a lack of impulse control (Baddeley and Wilson, 1988).

* Multiple studies have reiterated prevalent EF deficits in the areas of **Plan/Organize**, mental flexibility (**Shift**) and **Inhibit/Inhibition** (Hill, 2004).

Goal Writing for Executive Functioning

Executive Functioning

Defiance vs. Deficit:

- Executive functioning deficits are often interpreted as defiance
- When a task requires multiple executive skills (thinking or "doing"), a breakdown is more likely

Program Planning

Approach program planning at every stage of the A-B-C Contingency

- **<u>A</u>ntecedent:** Modify the environment to make the desired skill more likely to occur

- **<u>B</u>ehavior:** Systematically and directly teach the skill

- **<u>C</u>onsequence:** Reinforce each step of skill acquisition

Antecedent Modifications

First step in teaching EF skills- start with modifications to the environment

- Make changes to the environment
  - Add visuals
  - Add in self-management supports

- Make changes to the task
  - Shorten length
  - Link to reinforcement

- Make changes in the way you interact with the student
  - Pre-corrects
  - Prompts and prompt fading
  - Attitude

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Antecedent Program Planning: Environmental Modifications
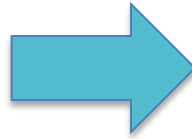
Making decisions on...

- When to modify the environment:
  - Is this specific skill one that will be needed in the future?

- When to provide accommodations:
  - Are there acceptable accommodations adults use for this skill?

- When to teach a new skill:
  - Is the student developmentally ready to learn the necessary replacement skill?

EF Goal Writing: Example 1

Typical Process

What do you want to change?		What is the replacement behavior(s)?
Moaning/whining when presented with work	→	Beginning work when asked

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EF Goal Writing

Improved Process

What do you want to change?
Moaning/whining when presented with work

What is the replacement behavior(s)?
Raise hand to ask for help *(focus on self monitoring)*
Engage in task

Function of Behavior/skill deficit:
To obtain help for task
To gain attention

EF Goal Writing
Improved Process, Continued

What is the replacement behavior(s)?

Raise hand to ask for help
Engage in task

What skills/steps will let you know they are learning the replacement behavior?
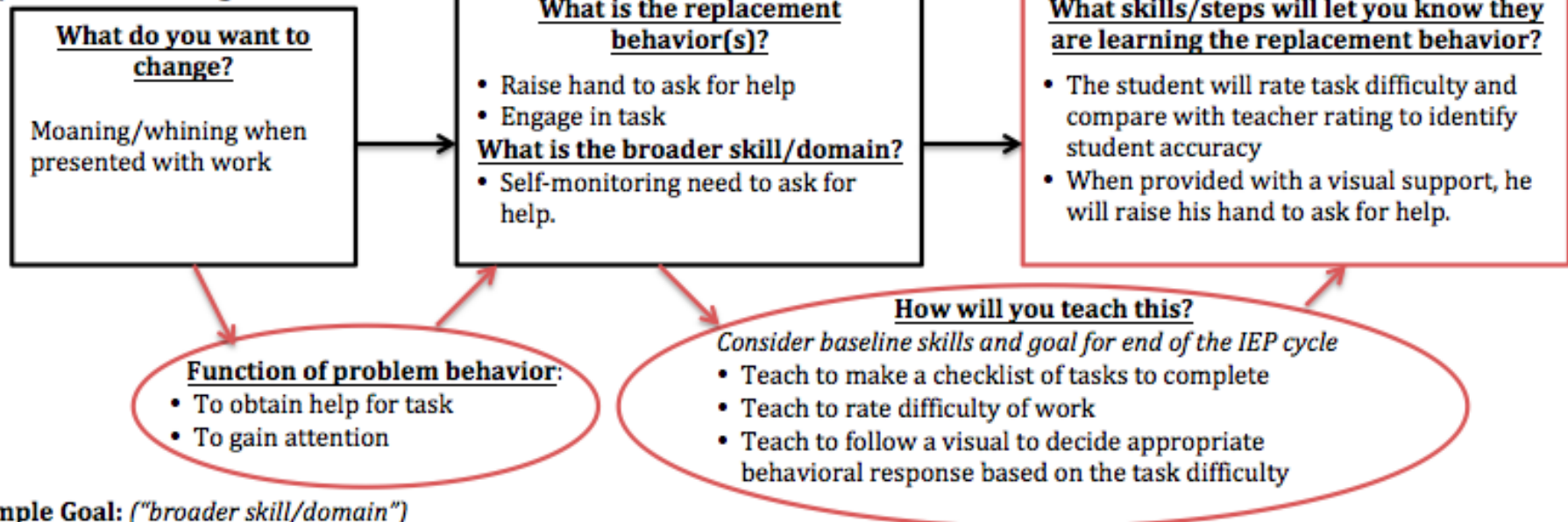
- Learn to accurately rate the difficulty of a task (compared to teacher rating)
- Provided visual support, will raise hand to ask for help

How will you teach this?

Need to consider the student's baseline skills and where you want them to be at the end of the IEP cycle

- Teach to make a checklist of tasks to complete
- Teach to rate difficulty of work
- Teach to follow a visual to decide appropriate behavioral response based on the task difficulty

Proposed Goal Writing Process:

What do you want to change?

Moaning/whining when presented with work

What is the replacement behavior(s)?

- Raise hand to ask for help
- Engage in task

What is the broader skill/domain?

- Self-monitoring need to ask for help.

What skills/steps will let you know they are learning the replacement behavior?

- The student will rate task difficulty and compare with teacher rating to identify student accuracy
- When provided with a visual support, he will raise his hand to ask for help.

Function of problem behavior:

- To obtain help for task
- To gain attention

How will you teach this?

Consider baseline skills and goal for end of the IEP cycle

- Teach to make a checklist of tasks to complete
- Teach to rate difficulty of work
- Teach to follow a visual to decide appropriate behavioral response based on the task difficulty

Example Goal: *("broader skill/domain")*
Student will increase his self-monitoring and task engagement by mastery of the following benchmarks.

Benchmarks: *(Skills/steps that let me know they are learning the desired replacement behavior)*

1. Student will accurately rate task difficulty (using three levels of difficulty) with 80% accuracy when compared to teacher rating.
2. When provided a visual cue, Student will raise his hand to ask for help when presented with tasks rated to have the highest difficulty on 70% of opportunities (as measured by the number of times the student raises his hand to request help divided by the total number of times the student whines or raises his hand to request help).

Data Collection:

Benchmark 1:

- Use weekly probe across at least 5 different activities
- Obtain percentage by dividing the number of times the student's independent rating of the task difficulty level agreed with the teacher's rating by the total number of activities probed

**Benchmark 2:**

Obtain 3 probes per week
Obtain percentage of opportunities by dividing the number of times the student raises his hand to request help by the total number of times the student whines or raises his hand to request help).

EF Goal Writing: Let's Try It!

Typical Process

What do you want to change?

Verbal Outburst (sometimes paired with slamming materials)

Refusal to participate in new activity/routine change

→
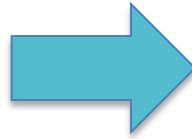
What is the replacement behavior(s)?

Participate in all activities with appropriate voice volume

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Behavior Goal Writing

Improved Process

What do you want to change?
Verbal Outburst (sometimes paired with slamming materials)

Refusal to participate in new activity/routine change

What is the replacement behavior(s)?
What do you think?
Consider calming strategies, returning to task, returning to routine

Function of Behavior/skill deficit:
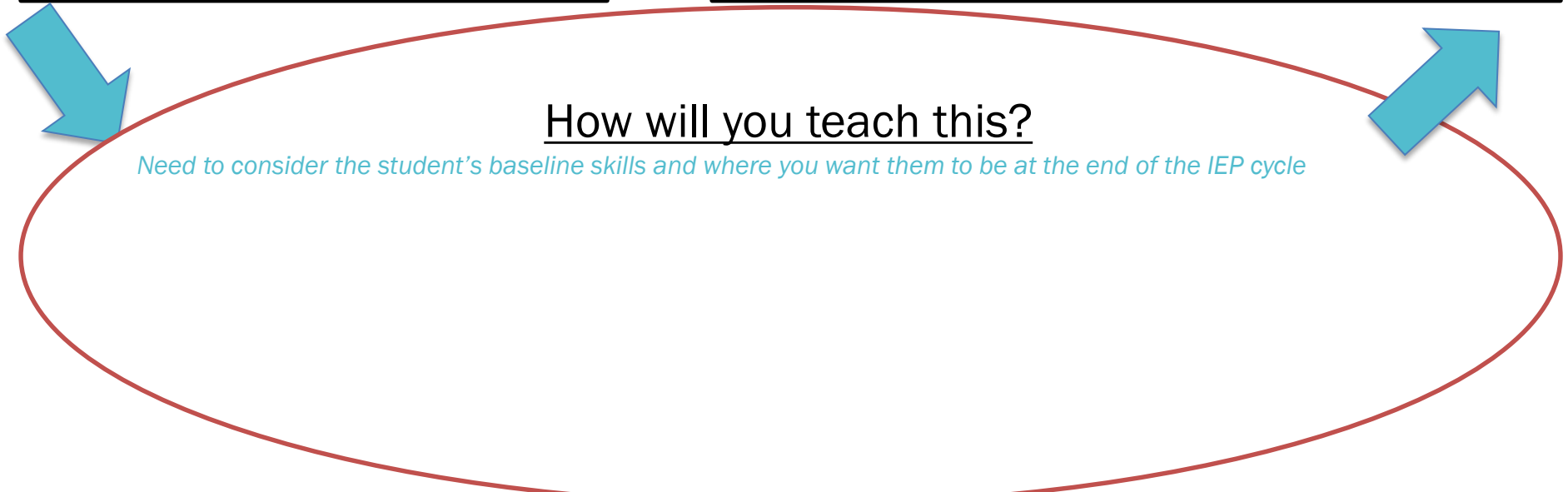EF Flexibility with Changes in Routine

Behavior Goal Writing
Improved Process, Continued

What is the replacement behavior(s)?

What skills/steps will let you know they are learning the replacement behavior?

How will you teach this?
Need to consider the student's baseline skills and where you want them to be at the end of the IEP cycle

Systematic Skill Instruction

When Do I Work on This?

Embed services within pre-existing routines when possible:

- What are the pre-established routines in the class?
- How can the structures this student needs be incorporated into those routines?

Reinforcement is a CRUCIAL part of this process!

All students can benefit from guided practice of executive functioning skills.

Reinforcement

- Should be based on individual preferences of the student
    - For something to be considered reinforcement there must be a record that it has increased the frequency of behavior in the past
    - If the student is not interested in the item, it will not work as reinforcement
- If progress is slow or inconsistent, it is often an issue of reinforcement
    - Often reinforcement is faded too quickly and the adults want to rely on intrinsic rewards for doing well
- Just because you get better at something does not mean you should be reinforced less
    - Think about working for a paycheck: each year, you get better at your job. Would you accept less pay just because you are doing what is "expected"?

Instructional Plan

"A" Antecedents changed	"B" Teach new behavior	"C" Get reinforcement only for appropriate behavior
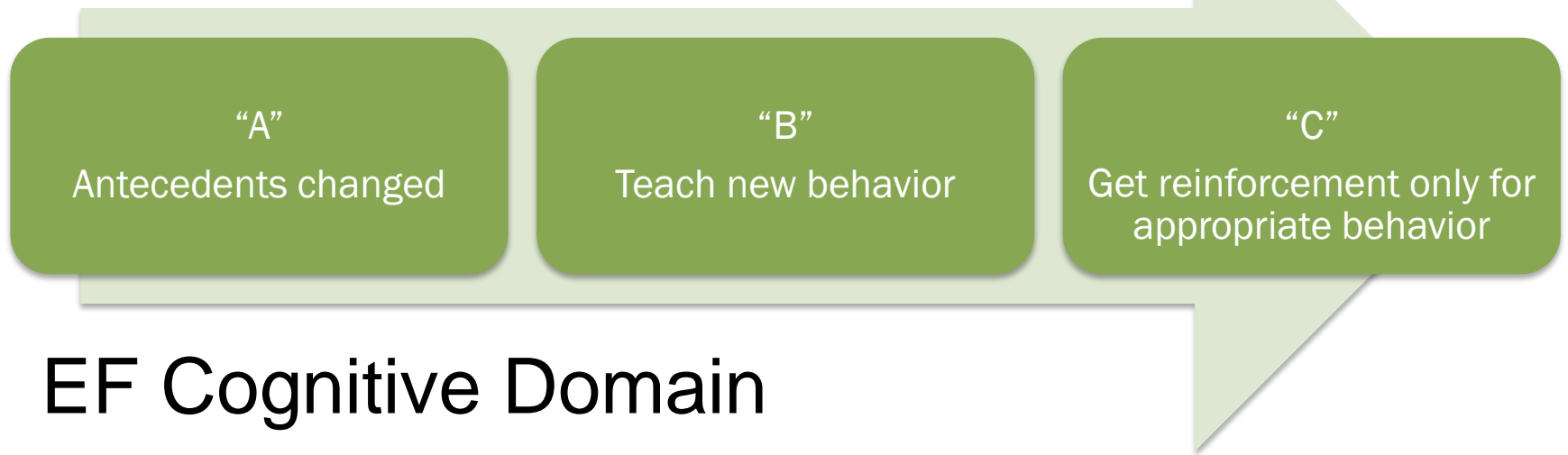
- EF Cognitive Domain
  - Working memory
- EF Emotional Domain
  - Emotional control
- EF Behavioral Domain
  - Response Inhibition

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Working Memory

"A" Antecedents changed	"B" Teach new behavior	"C" Get reinforcement only for appropriate behavior

• Gain attention (eye contact) before providing information to be remembered
 	
• Keep external stimuli at a minimum
 	
• Use visual supports
   – Checklists
   – Schedules
   – Pictures
	• Task analysis and chaining to teach complex tasks
	
	• "Dora the Explorer" Language
	
	• Teach what to do when cannot remember
		• Reinforce use of strategies and visual tools
		
		• Reinforce completion of multi-step tasks

Emotional Control

"A" Antecedents changed	"B" Teach new behavior	"C" Get reinforcement only for appropriate behavior

• Modify the environment to reduce the likelihood the student's emotions will escalate:
  – Build in daily routines
  – Reduce distractions to avoid over-stimulation (visual, auditory, and olfactory)
• Remind and rehearse what to expect in various situations
	• Social narratives (video modeling) focus on the appropriate behaviors
	• Scripts for student to follow in difficult situations to aide in problem solving
	• Rehearse what the student can do at each "level" of emotional escalation (Incredible 5-Point Scale, "What to do when my worries get too big" & "A 5 is Against the Law"
		• Reinforce for emotional control &/or for using strategies to de-escalate

Response Inhibition

"A" Antecedents changed	"B" Teach new behavior	"C" Get reinforcement only for appropriate behavior
• Identify times when confusion or stress could be heightened • Increase supervision (i.e., when student is over-tired or over-stimulated) • Provide pre-corrects for desired behavior • Rehearse new/replacement skills just before the stressful or difficult situation	• Directly teach to self-monitor • Help student learn to delay gratification • Practice by role-playing: context, consequences, alternative behaviors	• Reinforce IMMEDIATELY for exhibiting response inhibition (small steps too!) • Reinforce accurate self monitoring

Choose one to try to plan for:
Flexibility, Organization, Time Management

"A" Antecedents changed	"B" Teach new behavior	"C" Get reinforcement only for appropriate behavior

Activity

John does not turn in his assignments. The teacher has a row of homework bins (1 for each class period) on her bookshelf. John currently has a failing grade in the class because of missed assignments. Many are crumbled in the bottom of his backpack. His teacher is not concerned because she knows that periodically she can check his backpack and if they are still missing the special educator will help him check his locker to get them turned in for credit.

How would you approach teaching John the skills he is going to need to be successful?

- **Antecedent:** *What environmental changes/modifications can happen to make it more likely that John will be successful? (Remember, this is to support his new skill growth, not to completely replace his need to learn an important skill)*

- **Behavior:** *What strategy or skill will be taught to John? How will it be taught? By who? When?*

- **Consequence:** *How will John be reinforced for using his new skill?*

Thank you! Questions?

All materials reviewed today can be found here!
http://tinyurl.com/TCTEAMEF

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