What Is Executive Dysfunction? Sign and Symptoms of EFD

Janice Rodden :: 2/17/2017

What is Executive Dysfunction?

Executive dysfunction is a term used to describe the range of cognitive, behavioral, and emotional difficulties which often occur as a result of another disorder or a traumatic brain injury. Individuals with executive dysfunction struggle with planning, problem-solving, organization, and time management.

Children and adults with executive functioning problems struggle to organize materials, regulate emotions, set schedules and stick with tasks. They misplace papers, reports, and other school materials. They might have similar problems keeping track of their personal items or keeping their bedroom organized.

For children, behavior modification programs like token systems and daily report cards generally work well, however kids with ADHD get bored with token systems unless they collaborate on creating them. Similarly, daily report cards, while initially helpful, may end up making them feel bad about themselves when they don't succeed, thus creating a negative reinforcement loop.

What Is Executive Functioning?

Broadly speaking, executive functioning refers to the cognitive and mental abilities that help people engage in goal-directed action. They direct actions, control behavior, and motivate us to achieve our goals and prepare for future events. People with executive dysfunction struggle to organize and regulate their behavior in ways that will help them accomplish long-term goals.

Attention deficit disorder (ADHD or ADD) and executive functions are tightly linked, but far from synonymous. We all have executive functioning strengths and challenges that affect the attention, learning, work, and relationships. However, for those with ADHD, EF challenges are more severe and more numerous than for those without it.

The seven major types of self-regulation associated with executive functioning are as follows:

- 1. Self-Awareness: commanding self-directed attention
- 2. Self-Restraint: inhibiting yourself
- 3. Non-Verbal Working Memory: holding things in your mind to guide behavior
- 4. Verbal Working Memory: retaining internal speech
- 5. Emotional: using words and images along with self-awareness to alter how you feel about things
- 6. Self-Motivation: motivating yourself to do things when no outside consequences exist
- 7. Planning and Problem Solving: finding new approaches and solutions

How Do Executive Functions Develop?

The abilities associated with executive functioning don't all develop at once, but rather in a sequence — one skill building atop the next. All of the executive functions interact with each other, and impact how individuals regulate their behavior to create positive future outcomes.

Executive functions begin developing by age two, and are fully developed by age 30. People with ADHD often are 30 to 40 percent delayed in development, which makes them more likely to act motivated by short-term rather than longer-term goals.

The back of the brain is where you store information that is already learned. The front part of the brain is where you use this information to be socially effective and succeed in life. This prefrontal cortex mediates executive functioning and it contains four major circuits.

- The "what" circuit controls working memory, helping you execute plans, goals, and specific steps needed to complete a project.
- The "**when**" circuit helps you organize the order in which you complete activities, and address timelines.
- The "why" circuit controls emotions what you think about, and how you feel.
- The fourth "how" circuit controls self-awareness of your feelings and experiences.

People with executive functioning challenges and/or ADHD may experience impairments in one or more of these circuits and, therefore, their symptoms may touch memory, planning, emotional regulation, and/or social skills.

Read on to learn more about executive functions, and what therapies and interventions can help strengthen them. Consult with a physician if you recognize the symptoms below in your or your child.

Executive Dysfunction Symptoms

People with EF difficulties may experience the following symptoms:

- time blindness, or an inability to plan for and keep in mind future events
- difficulty stringing together actions to meet long-term goals
- trouble organizing materials and setting schedules
- trouble controlling emotions or impulses
- difficulty analyzing or processing information

Executive functions allow people to do the following:

- 1. Analyze a task
- 2. Plan how to address the task
- 3. Organize the steps needed to carry out the task
- 4. Develop timelines for completing the task

- 5. Adjust or shift the steps, if needed, to complete the task
- 6. Complete the task in a timely way

When a person has weak executive functions in certain areas, he or she may have trouble analyzing, planning, organizing, scheduling, and completing tasks. People with executive dysfunction and/or ADHD commonly lack the ability to handle frustration, start and finish tasks, recall and follow multi-step directions, stay on track, self monitor, and balance tasks (like sports and academic demands). Remediating the area of deficit reduces academic or work difficulties.

Executive Function and ADHD

ADHD is a biologically based disorder and a developmental impairment of executive functions – the selfmanagement system of the brain. While most people with ADHD will experience many areas of executive function impairment, people can have executive dysfunction without ADHD.

The following six clusters of executive functions tend to be impaired in individuals with ADHD:

- 1. Activation: organizing tasks and materials, estimating time, getting started
- 2. Focus: finding, sustaining, and shifting attention as needed
- 3. Effort: regulating alertness, sustaining motivation and processing speed
- 4. Emotion: managing frustration and modulating feelings
- 5. Memory: using working memory and accessing recall
- 6. Action: monitoring and regulating physical activity

Russell Barkley, Ph.D., who has been at the forefront of exploring the relationship between executive dysfunction and ADHD, says, "It is not that the individual does not know what to do. It is that somehow it does not get done."

Executive Dysfunction Causes

Executive dysfunctions can be the result of heredity, especially in ADHD but they can also result from damage to the prefrontal cortex, in vitro exposure to substance use, trauma or severe neglect. A study found that people with disorders, diseases, or injuries that damage that area of the brain are more prone to difficulties with executive functioning¹.

Evaluating Executive Function Difficulties

An executive function evaluation typically begins by ruling out other conditions with similar symptoms. The most common evaluation is the **Behavior Rating Inventory of Executive Function** (BRIEF), a written survey that kids/young adults, parents, and teachers complete to assess executive functioning. It comprises 86 questions designed to pinpoint the biggest area of difficulty. Additional evaluations include:

• Conners 3: a rating scale that evaluates ADHD and EF using parent, self, and teacher reports

- Barkley Deficits in Executive Functioning Scale (BDEFS) for Adults: assesses EF using self and other reports
- Comprehensive Executive Function Inventory (CEFI): compares a person to a norm group using parent, teacher, and self-report assessments

Executive functions are typically taxed during the transitions to 6th and 9th grade, when school structures and schedules change dramatically, and academic expectations increase. Parents and teachers often don't understand why kids can't work independently on an assignment, and assume they'll "pick up" the necessary skills. It's important to start helping kids with executive dysfunctions early, and to acknowledge the associated problems so that kids don't feel stupid or lazy.

The following is a list of Executive Function Skills. These are abilities that allow a student to be successful. Please mark any of the behaviors below that apply to your student. Only mark items that are comparatively worse than other students his or her age.

SUSTAINED ATTENTION: Ability to maintain attention despite distractibility, fatigue, *or* boredom.

- □ Distractibility
- □ Inconsistent performance
- □ Forgetfulness
- □ Zoning out/daydreaming
- □ Making careless mistakes
- □ Difficulty following directions
- □ Difficulty completing assignments
- □ Poor *note* taking skills
- □ Off task behaviors (i.e., talking to neighbors, playing with items in desk)

WORKING MEMORY: Holding information in mind while performing complex tasks.

- $\hfill\square$ Gets confused when too much information is presented
- □ Has trouble remembering things (i.e., phone numbers)
- □ May lose track of what they are doing as they work
- $\hfill\square$ May forget what they need to retrieve when sent on an errand
- □ May frequently switch tasks or fail to complete tasks
- □ Has difficulty keeping up with classroom lessons
- □ Has difficulty remaining attentive and focused for appropriate length of time
- □ Has difficulty sequencing math word problems
- □ Extreme difficulty solving problems mentally (i.e., mental math)
- □ Has poor reading comprehension
- □ Has difficulty summarizing
- Demonstrates inconsistent performance
- □ Has difficulty following directions
- □ Has difficulty keeping track of a lot of information

FLEXIBILITY: To move freely from one situation to another and to think flexibly in order to respond appropriately to the situation.

- □ Has difficulty making transitions
- □ Has difficulty starting a new task before the first task is complete
- □ Has difficulty switching gears (addition and subtraction problems on same page)
- Demonstrates perseverative behaviors
- □ Gives the same answers to different questions
- □ Has difficulty switching to a new topic or new subject
- □ Is inflexible
- □ Has difficulty with problem solving and conflict resolution
- □ Fails to comply with task instructions

Checklist for Executive Function Skills – Elementary Level

INHIBITION: The ability to stop one's own behavior at the appropriate time, including stopping actions and thoughts

- □ Has difficulty waiting
- □ Interrupts and disrupts group activities
- □ May call out
- □ Touches things or people
- Makes careless mistakes
- Displays hyperactivity
- □ Acts on auto-pilot without reflection
- □ Perseverates
- □ Has many false starts
- Dives right into problems without pausing, reflecting, developing a strategy or game plan
- □ Talks excessively
- □ Is unlikely to reflect or self-monitor
- □ Misinterprets directions

ORGANIZING/PLANNING/INITIATING: The ability to impose order on work, play, and storage spaces. The ability to manage current and future oriented task demands. The ability to begin a task or activity and to independently generate ideas, responses, or problem-solving strategies.

- □ May forget homework assignments/materials
- □ Can be unprepared and not be able to find materials or has a messy desk/workspace
- □ May get "stuck"
- □ Appears to be daydreaming
- □ Has difficulty completing assignments in a timely manner (may underestimate the time needed)
- □ Has difficulty organizing and expressing ideas in oral and/or written form
- □ Approaches tasks in a haphazard fashion
- □ Has difficulty responding to open-ended questions
- □ Performs better with multiple choice questions
- □ Has difficulty making decisions
- □ Has difficulty starting an assignment independently
- □ Has difficulty generating ideas, responses and problem solving
- □ Has difficulty with multi-step problem solving

EMOTIONAL CONTROL: The ability to modulate emotional responses by bringing rational thought to bear on feelings.

- □ Emotional reactions are out of sync with the situation (Small events trigger big emotional responses)
- □ May laugh hysterically or cry easily with little provocation
- □ Has temper tantrums or explosive outbursts
- □ Is bossy
- □ Is easily upset/overly sensitive
- Demonstrates aggressive behavior
- □ Is rigid/inflexible in thinking
- Demonstrates rapid mood changes without apparent cause)
- □ Has a low tolerance for frustration
- □ Is socially immature
- □ Appears insensitive to others' perspective and/or feelings

SELF-MONITORING: The ability to monitor one's own performance and to measure it against some standard of what is needed or expected.

- □ Makes careless mistakes
- □ Rushes through work
- □ Appears to lack pride in work
- □ Is disorganized
- □ Exhibits undesired classroom behavior
- □ Has difficulty checking over work/proofreading
- □ Produces sloppy work
- □ Acts without thinking things through
- □ Is unaware of behavior and impact on others
- □ Has difficulty with time management
- □ May have difficulty monitoring volume of voice
- □ Has difficulty with pragmatic skills
- □ Has difficulty empathizing
- □ Procrastinates
- □ Misses deadlines
- □ Has difficulty completing work

ABSTRACT REASONING/CONCEPT FORMATION/SALIENCY DETERMINATION: The ability to make connections, synthesize and categorize information.

- □ Has difficulty with perspective taking
- $\hfill\square$ Has difficulty with social problem solving
- $\hfill\square$ May ask the same questions repetitively
- □ Is a concrete, literal learner
- □ Has difficulty understanding what cannot be seen, heard or touched
- □ Has difficulty sorting/organizing information
- □ Has difficulty with abstract concepts
- □ Has difficulty with reading comprehension
- □ Has difficulty understanding the most important thing to focus on during lessons
- □ Has difficulty summarizing information
- □ Focuses on details and misses the "big picture"
- □ Has difficulty determining what is irrelevant versus relevant
- □ Has difficulty making inferences
- □ Performs better during structured tasks (answering specific concrete questions)
- □ Struggles in unstructured tasks when not given much direction (write a story)
- □ Has difficulty reading between the lines or "catching on"

The following is a list of Executive Function Skills. These are abilities that allow a student to be successful. Please mark any of the behaviors below that apply to your student. Only mark items that are comparatively worse than other students his or her age.

INHIBITION: Ability to stop one's own behavior at the appropriate time, including inappropriate actions and thoughts.

- □ Calls out during lessons
- □ Touches objects/peers
- □ Invades others' personal space
- □ Interrupts conversations
- □ Makes careless errors- written & verbal
- □ Struggles with directions: not reading directions or misreading directions
- □ Misinterprets text
- □ Attempts to solve problems without planning
- □ Starts & stops tasks repeatedly

FLEXIBILITY: Ability to move from one situation to another and to think flexibly. The ability to stop an old behavior and start a new one.

- □ Perseverates on a topic, idea or activity
- □ Repeats the same behavior after the task has changed
- □ Is driven by routine and consistency
- □ Needs the same seat
- □ Wears the same color
- □ Eats the same foods
- □ Has difficulty transitioning class to class, weekend to school, one activity to another,...
- □ Is unable to tolerate changes in schedule
- □ Has difficulty with transitioning within conversation

EMOTIONAL CONTROL: Ability to manage emotions in order to achieve goals and complete tasks.

- □ Tantrums
- □ Cries
- □ Laughs inappropriately
- Calls out
- □ Makes irrational statements ("Teacher hates me," "Someone's laughing at me")
- Demonstrates aggressive behavior, physically or verbally

Checklist for Executive Function Skills – Middle School Level

PLANNING, ORGANIZING AND INITIATING: Ability to plan, begin and manage a task or activity independently.

- Doesn't begin tasks (i.e. sits and stares)
- □ Has messy desk/notebooks/locker/backpacks
- □ Has difficulty with unstructured tasks
- □ Is often off task (i.e. looks lost)
- □ Has difficulty understanding what to do
- □ Has difficulty with time management
- □ Is overwhelmed by large amounts of information
- □ Has difficulty retrieving information spontaneously or answering open ended questions
- □ Has difficulty handing in assignments in a timely fashion

WORKING MEMORY: Ability to hold information in one's mind for the purpose of completing a task.

- □ Has difficulty keeping up with information to complete a task
- □ May look like poor attention
- □ Misses important pieces of information
- Gets confused when too much information is presented at once or too quickly (i.e. information overload)
- □ Has difficulty taking notes from lectures
- □ Has extreme difficulty solving problems mentally (i.e. mental math)
- □ Has difficulty keeping up with and maintaining conversation
- □ Frequently asks questions
- □ Has difficulty sequencing

SELF-MONITORING: Ability "to monitor one's own performance and "to measure against some standard of what is needed or expected.

- □ Has difficulty with perspective taking
- □ Has difficulty understanding someone else's point of view
- □ Is often unaware of his own behavior or its impact on others
- □ Has difficulty with empathy
- □ Has difficulty knowing what to say and when to say it

SUSTAINED ATTENTION: Ability to notice information and maintain focus over a long period of time.

- Demonstrates poor attention
- Zones out
- Deomonstrates inconsistent performance
- □ Has difficulty with note-taking
- □ Is distractible
- □ Pays attention to everything, not just target activity
- □ Struggles to stay on task
- □ Asks questions that were just answered

ABSTRACT REASONING/CONCEPT FORMATION/SALIENCY: Ability to see relationships, make connections and categorize information.

- □ Has difficulty forming theories and problem solving
- □ Has difficulty understanding what he/she cannot hear, see or touch
- □ Has difficulty understanding figurative language
- □ Has difficulty understanding ambiguous language
- □ Has difficulty understanding multiple meaning words, similes and metaphors, humor and sarcasm
- □ Has difficulty synthesizing information
- □ Has difficulty determining relevant vs. irrelevant details
- □ Has difficulty determining main idea
- □ Has difficulty determining related concepts
- □ Has difficulty "reading between the lines"
- □ Misses the "Big Picture"

The following is a list of Executive Function Skills. These are abilities that allow a student to be successful. Please mark any of the behaviors below that apply to your student. Only mark items that are comparatively worse than other students his or her age.

INHIBITION: The ability to stop one's own behavior at the appropriate time, including stopping actions and thoughts.

- □ Calls out during lessons
- Does not follow directions
- □ Has inconsistent test performance
- □ Touches things/ other people
- □ Is restless
- □ Demonstrates over-active behaviors

FLEXIBILITY: The ability to move freely from one situation to another and to think flexibly in order to respond appropriately to the situation.

- Perseverates on previous and current tasks
- □ Is often not prepared for next activity
- □ May just sit and stare
- Does not participate

EMOTIONAL CONTROL: The ability to modulate emotional responses by bringing rational thought to bear on feelings.

- Often calls out in class without consideration of others
- □ Lacks emotional regulation
- □ Has difficulty redirecting and refocusing once the child exhibits the lack of emotional control (e.g., temper tantrums, cursing, crying, extreme laughter, etc.)
- □ Exhibits unpredictable emotional responses that are out-of-sync with the situation

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

- □ Sits with a blank page
- □ Exhibits task avoidance behaviors such as leaving the classroom
- □ Gives excuses on a consistent basis

WORKING MEMORY: The capacity to hold information in mind for the purpose of completing a task.

- □ May appear as poor attention
- Only obtains part of the information and gets confused when too much information is presented in quick manner
- □ Has significant difficulty solving problems mentally
- □ Has poor reading comprehension
- □ Has difficulty sequencing information

Adapted from: Public Schools, Jericho. "Executive Functioning: A Handbook for Grades K-12." (n.d.): n. pag. Jericho Schools. Aug. 2012. Web. 10 Mar. 2015. http://www.jerichoschools.org/.

Checklist for Executive Function Skills – High School Level

PLANNING/ORGANIZATION: The ability to manage current and future-oriented task demands.

- □ Lacks follow through with assignments or projects
- □ Inconsistently meets of deadlines and completes homework
- □ Has messy backpack and/or folders

ORGANIZATION OF MATERIALS: The ability to impose order on work, play, and storage spaces.

- □ Lacks checklist(s)
- Demonstrates inefficient use of space
- □ Has disorganized desk and/or locker
- □ Is often missing materials needed for class (e.g., writing utensils, paper)

SUSTAINED ATTENTION: The ability to hold attention in one spot and to maintain focus over a prolonged period of time.

- □ Has poor attention; is easily distractible
- □ "Zones Out"
- □ Is inconsist-The student knows what was covered when s/he was paying attention and does not know what was covered when s/he was not paying attention
- □ Has difficulty beginning activities
- □ Has difficulty remaining on task until activity is finished
- Pays attention to everything; however, does not filter relevant from irrelevant information

SELF-MONITORING: The ability to monitor one's own performance and to measure it against some standard of what is needed or expected.

- □ Is unaware of how behaviors impact their learning environment and the learning environment of others
- □ Lacks time management skills
- □ Fails to check work and makes careless mistakes
- □ Rushes through work and often overlooks directions and task requirements

Executive	Skills	Checklist
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Below, you will find a list of common school challenges. Please rate each one on a scale of 1 (not a problem) to 5 (a big problem). Your answers will help your teachers provide the best tools and supports possible!

Na	me:_			Date:
Re	spo	nse	Inhi	ition
1	2	3	4	5Rushing through work just to get it done
1	2	3	4	5Not having the patience to produce quality work
1	2	3	4	5Giving up on a homework assignment when I encounter an obstacle
1	2	3	4	5Avoiding or not completing homework when there are more fun things to do
Working Memory				
1	2	3	4	5Writing down instructions without enough detail to understand later
1	2	3	4	5Forgetting to take home necessary materials or take materials to class
1	2	3	4	5Forgetting to hand in homework
1	2	3	4	5Forgetting long-term projects or upcoming tests
1	2	3	4	5Not paying attention to classroom instructions/task directions
1	2	3	4	5Trouble remembering multiple directions or multiple problem steps
1	2	3	4	5Losing materials
1	2	3	4	5Forgetting to complete assignments
1	2	3	4	5Forgetting to check agenda/assignment book
1	2	3	4	5Not recording when an assignment is due

Emotional Control				
1	2	3	4	5Getting really irritated when a homework assignment is hard or confusing
1	2	3	4	5Finding it hard to get started on assignments because of perfectionism or fear of failure
1	2	3	4	5Freezing when taking tests and doing poorly despite studying long and hard
1	2	3	4	5Not seeing the point of an assignment and finding it hard to motivate myself to do it
Ta	sk Ir	nitia	tion	
Pro	ocrast	tinati	ng/av	oiding tasks due to
1	2	3	4	5not knowing how to get started
1	2	3	4	5believing the task will "take forever"
1	2	3	4	5believing my performance won't meet expectations
1	2	3	4	5seeing the task as tedious, boring, or irrelevant
1	2	3	4	5Finding other things to do rather than starting homework
1	2	3	4	5Difficulty getting back to work after breaks
Su	stai	ned	Atte	ention
1	2	3	4	5Taking frequent breaks when working
1	2	3	4	5Taking breaks that are too long
1	2	3	4	5Internally distracted – thoughts, states, moods, daydreams. Please specify:
1	2	3	4	5Externally distracted – sights, sounds, technology such as phone, computer, TV, video games. Please specify:

ADDITUDE

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Sustained Attention (Continued)				
1	2	3	4	5Rushing through work—sloppy/mistakes
1	2	3	4	5Not knowing limits (e.g., how long I can sustain attention) or when the best study time is
1	2	3	4	5Not recognizing when I'm off-task
Pla	anni	ng/I	Prio	ritization
1	2	3	4	5Not making a study plan (may not know how)
1	2	3	4	5Can't break down long-term projects into smaller tasks and timelines
1	2	3	4	5Having difficulty taking notes or studying for test because I can't distinguish important from non-important
1	2	3	4	5Not using or not knowing how to use agenda/assignment book
1	2	3	4	5Spending too much time on less important elements – can't put the most important parts or most important assignments first
1	2	3	4	5Planning unrealistically (e.g., fail to take into account obstacles to the plan)
	1.12212			
Fle	exibi	lity		
1	2	3	4	5Struggling with assignments that require creativity or are open-ended
1	2	3	4	5Getting stuck on one solution or one way of looking at a problem
1	2	3	4	5Having trouble coming up with topics or ideas of things to write about
1	2	3	4	5Having difficulty coming up with "Plan B" if the first attempt didn't work
•				
Or	gan	zati	on	
1	2	3	4	5Not using or knowing how to design an organizational system
1	2	3	4	5Not being able to find things in notebooks or backpacks
1	2	3	4	5Losing assignments or important papers
1	2	3	4	5Not having neat study area
1	2	3	4	5Losing electronic data—forget where work is stored or what name it's filed under

ADDITUDE

Executive Skills Checklist

Ti	Time Management			
Ca	n't es	timat	te ho	w long a task will take-due to
1	2	3	4	5not knowing how to get started
1	2	3	4	5overestimating how long it will take to do a task (therefore never getting started)
1	2	3	4	5underestimating how long it will take to do a task (therefore running out of time)
1	2	3	4	5Chronically late (for school, tutoring, other appointments, and obligations)
1	2	3	4	5Difficulty juggling multiple assignments and responsibilities because I can't judge time involved
1	2	3	4	5Overcommitted juggling too many obligations (and I think I can pull it off!)
1	2	3	4	5Lacking a sense of time urgency (doesn't appreciate that deadlines are important)
1	2	3	4	5Relying on deadline as activator or motivator
Goal-Directed Persistence				
1	2	3	4	5Not having a long-term goal
1	2	3	4	5Having a long-term goal but lacking a realistic plan to achieve the goal
1	2	3	4	5Not seeing how daily actions impact goal attainment
1	2	3	4	5Not having a long-term goal
1	2	3	4	5Not seeing studying as important and making minimal effort as a result
1	2	3	4	5Giving up in the face of an obstacle
1	2	3	4	5Having a "good enough" mentality that gets in the way of producing quality work
1	2	3	4	5"Not on the radar" — seeing work as not relevant or not important enough to do

ADDITUDE

Metacognition				
1 2 3 4 5 Can't acc past perfe or acader	curately evaluate skills (e.g., expect to do well on tests in spite of poor ormance; expect to go to a college or get a job without requisite skills mic record)			
1 2 3 4 5Can't ider	ntify appropriate study strategies			
1 2 3 4 5 Can't plan	n or organize a writing assignment			
1 2 3 4 5Can mem choice te	norize facts but missing the larger context (I do better on multiple- sts than essay questions)			
1 2 3 4 5Having a content a	hard time understanding more abstract concepts (math as well as rea subjects)			
1 2 3 4 5 Having di idea, read	fficulty making inferences, drawing conclusions, grasping the main ling between the lines			
1 2 3 4 5Failing to	check work/proofread			

Executive Functioning Checklist: Where does your child fall?

M thehomeschoolresourceroom.com/2020/10/24/executive-functioning-checklist

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Broadly speaking, executive functioning is a name given to a family of brain processes that all work together to help you remember, plan, and do daily activities. When someone manages to wake up on time, eat breakfast, get dressed, gather necessary supplies, handle a cut while shaving, and leave for work on time, they're using all eight executive functions.

The eight executive functions exist with some overlap (as you'll see in the checklist), but are usually categorized as follows:

- Response inhibition (aka impulse control)
- Planning & prioritizing
- Emotional control
- Mental flexibility
- Working memory
- Task initiation
- Self-monitoring
- Organization

All children will likely struggle with some aspect of executive functioning (which then is frequently called an executive *dysfunction*) at some point in their lives. This is because children's brains develop at different rates, and they mature in fits and spurts. If you don't believe me, first find me a child who walked out of the womb understanding how to get to bed on time!

The Executive Functioning Checklist

Response inhibition (aka impulse control)

- Makes careless mistakes just to get work 'done'
- Gives up as soon as they encounter a problem or challenge
- Blurts out answers instead of raising hand
- Does all the fun parts of an assignment first to avoid the hard parts
- Starts work before teacher finishes giving directions
- Engages in 'risky' behavior
- Avoids or doesn't complete homework
- Struggles to take turns
- Interrupts others while they're talking

• Touches others bodies or possessions without permission

Planning & Prioritizing

- Can't chunk larger assignments into smaller pieces
- Doesn't know where to start on a project or assignment
- Gets 'stuck' easily
- Often turns in assignments late because they underestimated complexity
- Prefers multiple choice questions to open-ended responses
- Struggles to take notes since everything seems equally important
- Has difficulty making decisions
- Struggles with strategizing and/or multi-step problem solving

Executive Functioning Checklist: Mental flexibility

- Can become fixated on aspects of a routine (wants to sit in the same place, eat the same food, wear the same clothes, etc)
- Struggles with transitions: between classes, activities, home/school, weekend/weekday, etc
- Copes poorly when schedules or routines change
- Can become 'hyperfocused' on one topic, idea, activity, etc
- Struggles to switch gears

Working Memory

- Really struggles to take notes from lectures (writing and listening at the same time)
- Experiences 'information overload' easily when too much is presented too quickly
- Finds mental math especially challenging
- Struggles to remember multi-step directions and follow them out
- May frequently forget what they were planning to say after raising hand or starting to speak
- Might need to read text passages (especially dense or long-winded ones) over and over to fully comprehend meaning
- Struggles with tracking the flow of conversations and participating appropriately

Emotional Control

- Can have angry outbursts at slight provocations
- Quick to call things 'unfair'
- Struggle to persevere through difficulties in homework
- Overreacts to negative situations (when disciplined, getting a bad grade, losing a game)
- May unexpectedly laugh hysterically or burst into tears
- Seems to have rapid mood changes

• Appears not to care about others' feelings

Executive Functioning Checklist: Task Initiation

- Doesn't know where to start on an assignment or project, even if directions were just given
- Has trouble focusing again after a break
- Procrastinates starting work until the last minute
- Finds other things to do instead of work (frequently going to the bathroom, sharpening pencil, being on phone, etc)
- Frequently seen with their head down during work time
- Asks for help all the time, even when you know they understand the material and are capable of the work

Self-Monitoring

- Unaware of how much effort they do or don't put into their work
- Think of grades somewhat magically, and confused/surprised by poor grades
- Doesn't recognize when their behavior negatively affects others
- Talks too loudly or quickly
- Might need to be told to sit down, stop touching that, put that down, etc, multiple times
- Doesn't think to check around them to gauge appropriate social behavior
- Might unknowingly exhibit "annoying" repetitive behaviors like pencil tapping, kneebouncing, or the like, even when others complain.

Organization

- Frequently loses assignments, supplies, library books, important messages, etc
- Doesn't change behaviors, even if they seem to want to/see consequences for disorganization
- Doesn't use planners, even if given one
- Has a disastrous-looking backpack, bedroom, and/or work space and has trouble finding anything
- Loses electronic files/emails because they can't remember where they stored them, or under what file name

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<u>Hillary Swetz</u>

by Sarah Ward, MS, CCC-SLP, and Kristen Jacobsen, MS, CCC-SLP

FTER RECESS, as part of the daily routine, the class reconvenes on the rug. Jackson runs from the back of the room where he has been playing with the class hamster to his cubby and slips off his jacket. It drops to the floor. He kicks off one boot. The teacher calls stragglers to join the others on the rug, so he hops to the circle wearing one boot and plops down. The teacher shares the agenda for the afternoon, which includes reviewing the science homework. Looking alarmed, Jackson pops up, and races back to his cubby while kicking off his other boot.

He pulls out his backpack, removes a homework folder, and grabs his assignment. Leaving the backpack open and boots scattered, he races to the homework bin. Realizing his name is not on the assignment, he zooms back to his desk to grab a pencil and sits back down on the rug with the rest of the class.

As the teacher gives instructions for the next activity, Jackson slips his homework underneath him and sits on it. The class is dismissed to their desks, and Jackson, talking excitedly to the boy next to him, stands up and follows the boy to his desk. His nameless homework is left on the floor. When he gets to his desk, his morning work folder and silent reading book are on the floor with assorted bits of paper. As the class starts the next activity, Jackson does not have the materials he needs. Again, he needs to walk about the class to get ready.

Anne has a music lesson Saturday morning at 9:00. Her mom wakes her at 7:30; Anne rolls over and groans, "Ten more minutes." Mom returns ten minutes later and tries again to wake Anne. After two more rounds of "Ten more minutes," Anne finally gets out of bed and heads for the shower. She showers for twenty minutes. Mom knocks on the door to announce the time. She encourages Anne to hustle so they can leave the house in thirty minutes. Anne gets out of the shower, puts on a robe, plops herself on the living room couch, flips open her laptop, and checks her social media sites. Mom reminds her to get ready for music. Ten minutes later, Anne saunters into her room and stares at a land mine of clothes trying to decide what to wear. She sits on her bed and starts to remove her nail polish.

Mom hollers a reminder, "Get dressed!" Finally, ten minutes later, Mom exclaims anxiously, "We have to go...!" Anne responds to this seemingly sudden pressure and shouts, "I'm coming!" She heads into

the bathroom in her bathrobe to blow dry her hair. Patience waning, Mom asks about her instrument and sheet music; Anne directs her to the basement. Finally finished with her hair, Anne heads to the kitchen for something to eat.

Exasperated, Mom, who is standing at the door holding Anne's instrument, music sheet, and breakfast bar, exclaims, "We need to go now. We are late!" Anne yells back in frustration, "I told you to wake me up earlier!"

As adults, we joke about "senior moments." That moment when you have imagined an item you are going to retrieve and then when you finally

that room to get it you draw a blank. "What did I come in here for?" Ack. A senior moment.

What do a student zigzagging about the classroom, a slow-paced teen, and a senior moment all have in common? Challenging executive function skills.

Weak executive function skills

Individuals with strong executive function skills stay a beat ahead. In contrast, teachers and parents describe individuals with weak executive function skills as being "a beat" or—as Jackson's teacher sighs—"twenty-two beats behind." How do executive skills enable us to stay a beat ahead? Strong executive function skills enable us to imagine and plan a "dry run" of the task in our mind before we begin to carry out the plan. If a task is planned in a different space than where the task will be carried out, then we create an image of the future space in our minds. For example, when a child hears the direction, "Get ready for lacrosse," he might be downstairs in the family room and imagine walking upstairs into the bedroom, heading over to the dresser, opening the third drawer, and retrieving their uniform. Then he might envision a transition from the bedroom to the mudroom and then the garage, where cleats and gear bags are stored.

The imagery is a mental anchor that allows the child to better resist distractions and maintain a pace so as to reach a goal. When forethought guides children's actions, they can carry out tasks more successfully. Small glitches, such as looking for a missing item, can also be

> handled more smoothly. However, when children with weak executive function skills hear the instruction "get ready," they hear the words, but do not pre-imagine the task or the steps to be ready. Even if they respond, "Okay," they do not initiate any actions to move toward their goal. When these children finally enter their rooms, because they have not pre-imagined the task, they are only starting to ask themselves, "Okay, what am I doing?" Without the vision of an outcome in mind, they are open to distraction. When these children go into their bedrooms and see books, Legos, and a laptop, they easily disengage from the goal of getting ready. They are

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ORGANIZATION & FOLLOWING DIRECTIONS: A basic map of a bedroom or a classroom can be used with a pointer to plan out directions and rehearse routines. This strategy can improve the use of mental imagery and self-talk, which are two skills that support a child's ability to carry out tasks and routines.

now a beat behind. Likewise, a senior moment is simply the loss of this pre-imagined intention.

Developing strong executive function skills

So, what can we do to develop a child's capacity to be a beat ahead and successfully carry out intentions in the future? According to Russell Barkley, in order to develop strong executive function skills, individuals "need to repeatedly practice: self-monitoring, self-stopping, seeing the future, saying the future, feeling the future, and playing with the future so as to effectively 'plan and go' toward that future."

Our natural inclination might be to provide checklists. While this strategy can sometimes work, it is limited. Checklists made by adults are not that helpful in creating mental imagery for children. For example, as adults, we might make a list of items to buy at the market. While making this list, we create, if only for a brief moment, a mental image of the supermarket, our dinner table, or shelves in our cabinets. These images help us navigate the market and remember items even if the list is left at home. When we hand children a checklist we've made, they have not used imagery to create the list and may find it hard to create imagery after the fact.

A better technique, when giving directions, is to use words that create mental imagery. For example, rather than asking a child, "What do you have for homework tonight?" pose a question such as: "When you walk into class tomorrow, what do you see yourself handing to your science teacher Mr. Jenson?" Instead of directing your child to get ready for soccer, try asking, "If you were standing at the door ready to go to soccer what would you look like? What does 'ready' look like?" To improve the effectiveness of your instruction to go upstairs and get dressed, try saying, "What drawer do you see opening to find your sport clothes?"

Visuals are also helpful in teaching kids to get ready and organize themselves. It's often a struggle to get children out the door in the morning. Multiple prompts and checklists might get your child out the door, but the process is likely to be difficult. Instead, try snapping a quick photo of your child when he is ready for school and standing by the door with his coat, clothing, shoes, backpack, and lunch. The next morning, show your child the photo, and simply say, "This is what 'ready' looks like." Ask him to imagine a plan that enables him to "match the picture." Once children remember the images in these photos, they can use their mental imagery and the photos no longer need to be shown.

In the classroom, cue students to imagine their actions before they transition. For example, when students are transitioning from recess, as they line up, say: "Imagine yourself at your cubby. What do you look like? What do you see yourself doing?" For younger students, ask them to describe how they will prepare for an activity. They can use a pointer to point to the space they will go to and pre-imagine themselves in



What does 'ready to start the lesson' look like? You need 5 minutes before your lesson actually starts at 4:30 to prepare so that you are ready when the lesson starts. This 5 minutes gives you time to take your instrument out of the case, open the sheet music to the practice warm-up page and to be seated in front of the music stand.



Working backwards to shade in the time needed, what does the travel time look like? 5 minutes to walk through the parking lot, 15 minutes to drive to the music lesson.

Shading in 5 minutes to gather your instrument and sheet music and 10 minutes to dress and brush your hair and teeth, you can see that you need to start getting ready for your 4:30 music lesson at 3:50.

that space carrying out the expected actions, "I am going to go to the back of the room and get a worksheet, then I am going to walk to the counter under the windows and get my text book, then I am going to sit at my desk and take out my pencil."

Take this technique a step further. Ask the student to draw a blueprint of the classroom or their house. Tape this blueprint to a clipboard, so the child can 'tap out their plan' before a task. Use a pencil or pointer to tap on the blueprint while encouraging them to pre-imagine and verbalize their plan; this method will foster an important skill—self-talk. For example: "I am going to walk into the bathroom, brush my teeth, then go across the hall to my bedroom. Next, I'll go to my closet, get my shoes, then walk downstairs to the front hall to get my backpack."

Use an analog clock

Children may still have difficulties using an appropriate pace even if they have a mental image of the directions. If their pace is slow, then they are vulnerable to distractions. What helps children to imagine carrying out a plan within a particular time frame? An analog clock.

As adults, we often strategize times before verbalizing the plan to children. We say, "You need to start getting ready at 3:45." However, this direction is given after we have thought, "Dance starts at 4:30, so we need to leave the house at 4:00." Try asking children to work backwards from an end time. Many children benefit from seeing how time fills up on an analog clock. A dry erase marker can be used to shade "slices" of time and write actions when planning backwards on a glass analog clock. See the example of backwards planning for estimating the time to prepare and travel to a music lesson (*see graphic above*). Students can also use the clock to visually plan their time for homework or in-class assignments.

Another advantage of drawing on the clock is building self-awareness. Students can see visual markers of the time that has passed, and then determine if they have used time effectively or had any "time robbers" such as daydreaming or getting distracted by the television or Internet. To stay a beat ahead, students must monitor how closely their outcomes match the future plan they had imagined.

Ask students to plan checkpoints when they can stop and determine if they are on track with their plan. Students set a midpoint timer to stop and check how well they are working towards completing an assignment. The purpose of the timer is to improve self-monitoring and an awareness of how time is used, but not how quickly they can complete an assignment. Students who set timers for the end of a task frequently experience more stress, whereas a timer set for check-ins midway through a task provides opportunities for problem solving. Overall, when students are given guidance to plan and self-monitor while using mental imagery, they often experience independence and a better sense of self-control. Try it!

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20 Tips to Help De-escalate Interactions With Anxious or Defiant Students

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Katrina Schwartz 🍏 Apr 21, 2016

Mind Shift

Students' behavior is a form of communication

and when it's negative it almost always stems from an underlying cause. There are many reasons kids might be acting out, which makes it difficult for a teacher in a crowded classroom to figure out the root cause. But even if there was time and space to do so, most teachers receive very little training in behavior during their credentialing programs. On average, teacher training programs mandate zero to one classes on behavior and zero to one courses on mental health. Teacher training programs mostly assume that kids in public schools will be "typical," but that assumption can handicap teachers when they get into real classrooms.

A National Institute of Health study found that 25.1 percent of kids 13-18 in the US have been diagnosed with anxiety disorders. No one knows how many more haven't been diagnosed. Additionally between eight and 15 percent of the school-aged population has learning disabilities (there is a range because there's no standard definition of what constitutes a learning disability). Nine percent of 13-18 year-olds have been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) (although the number one misdiagnoses of anxiety is ADHD), and 11.2 percent suffer from depression.

'We are 50% of every interaction with a child, so we have a lot of control over that interaction.'

"So basically we have this gap in teacher education," said Jessica Minahan, a certified behavior analyst, special educator, and co-author of *The Behavior Code: A Practical Guide to Understanding and Teaching the Most Challenging Students*. She spoke to educators gathered at a Learning and the Brain conference about strategies that work with oppositional students.

Minahan is usually called into schools to help with the most challenging behavior. She finds that often teachers are trying typical behavioral strategies for a group of kids for whom those strategies don't work. However, she says after teachers learn more about why kids are behaving badly there are some simple strategies to approach defiant behavior like avoiding work, fighting, and causing problems during transitions with more empathy.

ANXIETY

Anxiety is a huge barrier to learning and very difficult for educators to identify. "When anxiety is fueling the behavior, it's the most confusing and complicated to figure out," Minahan said. That's because a student isn't always anxious; it tends to come and go based on events in their lives, so their difficulties aren't consistent. When we are anxious our working memory tanks, making it very difficult to recall any salient information.

Researchers surveyed a group of first graders none of whom had any reading or math disabilities. Those who had been diagnosed with an anxiety disorder were eight times more likely to be in the lowest achieving group in reading, and two-point-five times more likely to be in the lowest quartile in math achievement by the spring.

"Anxiety is a learning disability; it inhibits your ability to learn," Minahan said. But it isn't usually recognized as a learning disability and there is almost never a plan for how to address it in the classroom. "For kids with anxiety, the 'can'ts fluctuate," Minahan said. "When they're calm they can. When they're anxious they can't. And that's very deceiving."

Anxiety isn't about ability, it's about interference, which means that traditional rewards and consequences don't often work with this group of learners.

"Rewards and consequences are super helpful to increase motivation for something I'm able to do," Minahan said. But an anxious person's brain has shut down and they aren't able in that moment to complete the task being asked of them. The best way to combat this tricky problem is to try to prevent anxiety triggers and build up students' social and emotional skills to cope with the moments when anxiety sets in.

When kids are in the throes of bad behavior they have poor self-regulation skills, often get into negative thinking cycles that they can't stop, have poor executive functioning, become inflexible thinkers and lose social skills like the ability to think about another person's perspective. That's why kids can seem so unempathetic when teachers ask, "how do you think that made Sam feel?" At that moment, the student acting out has no ability to take Sam's perspective, but a few hours later or the next day, he might be able to show the remorse educators want to see.

ALL BEHAVIOR HAS A FUNCTION

Bad behavior is often connected to seeking attention, and when kids act out, they can see the results.* "Negative attention is way easier to get and hands down easier to understand," Minahan said. "It's much more efficient." Adults tend to be unpredictable with attention when a student is doing what she is supposed to do, but as soon as there's a dramatic, obvious tantrum, the student has the teacher's attention. And negative attention is powerful - one student can hijack a whole classroom.

A common teacher response to low-level negative attention seeking is to ignore the student. The teacher doesn't want to reward bad behavior. "I want to caution you about ignoring someone with anxiety because their anxiety goes up," Minahan said. Ignoring an already anxious student can accidentally convey the message that the teacher doesn't care about the student, and worse might escalate the situation. Perhaps a teacher can ignore a student tapping his pencil or banging on his desk, but threatening behavior can't be ignored. And the student learns exactly what level of behavior he must exhibit to get attention.

TIP 1: Instead, "what you need to do is make positive attention compete better," Minahan said. She often suggests that teachers actively engage the most difficult student at the beginning of class saying something like, "I can't wait to see what you think of this assignment. I'm going to check on you in 5 minutes." When the teacher actually comes back in five minutes, validates the student's progress, and tells her another check-in is coming in ten minutes it sets up a pattern of predictable attention for positive behavior. And while it might seem unfair to take that extra time and care with one student, it ultimately saves instruction time when a teacher doesn't have to deal with a tantrum that sends the student out of the room.

TIP 2: Often in an attempt to form a positive relationship with a student teachers will publicly praise positive behavior. That can backfire, especially with anxious kids who don't want any extra attention from peers. Private or non-verbal praise is often better. Minahan recommends pulling students aside at the beginning of the year to ask how teachers can best tell them they're proud. "It's a gift to your February self if you can figure out a system now, otherwise you'll get stuck on the negative attention scale," Minahan said.

Tip 2.1: She also recommends fact-based praise as opposed to general praise. Vague praise is easy to dismiss.

ANTECEDENTS TO BAD BEHAVIOR

Many kids have predictable anxiety triggers like unstructured time, transitions, writing tasks, social demands or any unexpected change. Similarly the antecedents of negative behavior are fairly predictable: unfacilitated social interactions, interaction with an authoritative adult, being asked to wait, when demands are placed, being told no, writing, and transitions.**

Tip 3: "Teach waiting now," Minahan said. "When you are anxious, despite your age, it's very hard to wait." She was asked to observe a boy who constantly disrupted class. Minahan soon noticed the boy often did his work, but if he finished early or there was downtime in the class, he would start causing trouble. When Minahan pointed this out to him he had no idea what "wait time" was. She had to spell out to him that when he finished a task he should apply a strategy, like turning over the paper and doodling appropriately on the back. After this small intervention the student's behavior was so improved that his teacher thought he'd gone on medication.

'You can have really bright, able children whose anxiety is interfering so much.' with anxiety, there are a

number of strategies teachers can employ. The first is not to take any student behavior personally. The student isn't trying to manipulate or torture the teacher, his behavior is reflecting something going on internally. Often a short movement break can help relieve anxiety, but not the way they are commonly given.

For kids

Minahan described a seventh grade girl who was recovering from an eating disorder. The girl was scraping her arms so badly they would bleed. After lunch, predictably, the behavior was worse, so her teachers were letting her color and draw to relieve her anxiety. Another common break is to tell a student to go get a drink of water down the hall. The coloring break wasn't working for this seventh grader and Minahan soon figured out why. "We accidentally left her alone to fester in her anxious thoughts," she said.

Tip 4: Leaving class doesn't give the student a break from internal negative thoughts like "I'm fat," or "I'm not smart enough," which paralyze thinking. But a break paired with a cognitive distraction does offer respite from the "all or nothing" thinking that's so common with anxious students. An older student might take a break and record herself reading a book out loud for a younger student with dyslexia. It's impossible to read out loud and think another thought. Other distractions could include sports trivia, sudoku or crossword puzzles. Little kids might do a Where's Waldo or look through a Highlight magazine for the hidden picture.

Tip 5: When teachers want to wrap up a task they often use a countdown. "Silent reading time is going to be over in five minutes." But counting down doesn't support a high achieving anxious child who feels she must finish. And it takes a lot of executive function skills and cognitive flexibility to fight the urge to keep going after the time is up. So instead of counting down, a teacher might walk over to that student and say, let's find a good stopping point. She may stop a minute later than the rest of the class when she reaches the designated point, but it won't escalate into a tug-of-war.

Transitions are another common time for kids to act out. Younger students often don't want to come in from recess, for example. But when a teacher says, "Line up. Recess is over. It's time for your spelling quiz," it's no wonder the student doesn't want to go from something he loves to something he hates.

Tip 6: The teacher can give students an in-between step to make the transition more palatable. Go from recess, to two minutes of coloring, to the spelling quiz. The intermediary step gives that non-compliant student behavioral momentum. He's already sitting down, quiet, with pen in hand, so the jump to spelling isn't as jarring.

For middle and high school students, school is all about being social, but the only times students get to see their friends are in the two to five minute passing periods between classes. Again, the transition is from something they love to something they hate, so don't make that transition extra hard by collecting homework as they come in the door. The toughest kids are probably already not doing well in the class, and a reminder of the homework exacerbates feelings of inadequacy.

Tip 7: One high school geometry teacher started playing two minute YouTube videos about geometry as students came into class. It got students from the hallway into the classroom without thinking negatively and her class started to run more smoothly. She didn't have the same interruptions she used to, which made the lost two minutes seem worth it.

Tip 8: Minahan also likes some of the biofeedback tools that are now available, like the EmWave. A wound up student puts a sensor on his finger and calming down becomes a game. He might start out with a picture of a black and white forest, but as he calms down (and the sensor monitors his heart rate) the colors start to pop in. It can take as little as two to five minutes to completely calm a kid down when they can see the feedback so clearly.

"I like it because it's so concrete," Minahan said. A student with high functioning autism might not even know what a teacher means by "calm down," but with the biofeedback device she can see what it means.

WORK AVOIDANCE

Minahan says it's very common for students to have trouble initiating work, persisting through work and asking for help, but there are strategies to help kids build the skills to get better in these areas.

"You can have really bright, able children whose anxiety is interfering so much," Minahan said. The anxiety isn't coming from nowhere; it's coming from prior experiences of feeling frozen and stupid. In that moment the child's working memory isn't working, so teachers need to find ways to bypass it until the anxiety passes.

Tip 9: One way is to let students preview the work for the day. In the morning, an elementary school teacher might work on the first few problems with the anxious child so she knows she can do it. Then, when it's time for that work later in the day, that child receives the sheet she's already started and can go from there.

Tip 9.1: In high school, teachers can give students with trouble initiating the preview as homework. Students can start at home without any pressure and continue at school. "Fight or flight is the worst when they first see it," Minahan said, so try to bypass that moment and prevent a breakdown.

Tip 10: At the same time, when the teacher names the strategies a student is employing, he is helping the student build a toolbox that can be used independently. Strategies might include, asking a teacher to help her start when she feels frozen, or asking to preview the homework. For perfectionist students, difficulty starting can stem from a fear of messing up. Give those students dry erase boards, where the mess ups can be easily erased. It helps when teachers treat the difficulty starting as a small problem and say something like, "Looks like you're not initiating. What strategy are you going to use?"

'When I shift the reinforcement to skills, I've noticed the skills go up and that's what makes the difference for the kids who have mental health difficulties.'

Tip 11: Some strategies to build persistence include skipping the hard ones and doing the ones a student knows first, working with a buddy, and double checking work on problems that have been completed.

Giving help in class is often a tricky balance, especially if a student is too embarrassed to ask vocally. Instead of acting out because she can't do the work, the student might raise her hand, pass the teacher a note or make eye contact. Then the teacher has to be careful not to give too much help. "We accidentally create dependency because we help so much," Minahan said.

That goes for academics as well as behavior. Often a teacher will notice a student becoming agitated and dysregulated and tell him to take a short walk. But ultimately the student will be better served if he can learn to monitor himself and implement strategies when he notices early signs of agitation. "Kids have to learn how to catch themselves on the way up and calm down there," Minahan said, because that's when the strategies work. But kids need to be taught how to recognize the signs.

Tip 12: Teach kids how to do a body check. With younger students a teacher can describe the signs of agitation as they are happening so the student starts to recognize them. With older students, ask them where in their body they feel anxious, for example, "in your belly?" "Give them the data every day," Minahan said. "This is your body on the way up." After the groundwork has been laid, a teacher can just say "body check, please" to let a student know it's time to check in with themselves and start using a strategy.

But what can you do when a kid is already exploding? Minahan says, not much because the child will have a very hard time reacting in a reasonable way once he or she is riled up.

Tip 13: What educators can do is anticipate those moments and rehearse self-calming strategies when the child is calm.

In one case, Minahan knew an elementary student she was working with was going to have a traumatic change in her life. The child's mom was giving her up to foster care and the date had been set. To prepare for what would undoubtedly be a moment when the student couldn't control herself, Minahan had her practice self-calming in the social worker's office, where she would probably go on the day. Twice a day for five minutes she rehearsed a self-calming routine when she was already calm so her working memory was available and she was learning the strategies.

When the day came and the child did freak out, Minahan quickly got her into the office with very little touching or verbal interaction which might further set her off. Once there, the girl got into her routine, and started singing to herself as a cognitive distraction. "The rehearsal allowed for automaticity and did not require cognition or working memory in that moment," Minahan said.

Tip 14: Rehearse replies to confrontations. Minahan worked with a high school student who constantly got in fights. If he felt disrespected he'd start swinging. Together they rehearsed over and over him saying, "I don't have time for this," and walking away. During the rehearsals, Minahan gave him something to hold in his hands as he said this. And soon, he stopped getting in fights. It gave him the moment he needed to make a decision not to use his fists and a go-to automatic reply.

Tip 15: Use data to disprove negative thinking. Writing is a common barrier for kids with anxiety, Minahan said. But one way to begin getting students past this hurdle is to ask them how hard a task will be before they start and again after they've completed it. Almost always the perception of the task is worse than the actual task. With several weeks of data you can show students the pattern in their responses.

Minahan worked with a girl who hated writing so much that she was skipping school twice a week. She would often say that writing was torture to her. Minahan broke writing down into component parts with corresponding strategies for getting started on each part. When the student worked on a writing task Minahan would ask her how many strategies she employed. Often the girl didn't use that many strategies, which didn't fit with her own conception of herself. "We reframed her whole thinking and she felt more empowered to solve her problems," Minahan said.

INTERACTION STRATEGIES

In any interaction with students teachers can only control their own behavior, but that's actually a lot of power. "We are 50% of every interaction with a child," Minahan said. "We have a lot of control over that interaction."

Tip 16: If a teacher gets off on the wrong foot with a student early in the year, try randomly being kind to the child, rather than only giving positive attention based on his or her behavior. This kind of noncontingent reinforcement helps the child to see the teacher likes him for who he is, not because he does math well or reads perfectly, Minahan said.

Tip 17: In areas where the difficult student is competent, give her a leadership role. Maybe let her take a younger child to the nurse or start an activity club. This helps change the child's perception of herself and also her relationship to the teacher.

Tip 18: When demanding something of a student, don't ask yes or no questions and teach kids not to ask yes or no questions. In that scenario, someone has a 50 percent chance of being disappointed with the answer. By changing the question, the teacher opens the door for the answer to be diffusing, rather than an escalation of defiance. For example, if a student asks, "Can I work with Jack?" The teacher can reframe the question: "Oh, did you want to know when you could work with Jack? You can ask: When can I work with Jack." The student might not like the answer, but it likely won't produce the same explosive reaction as getting an outright "no."

Tip 19: Give kids time and space. If a student is prone to arguing, eye contact and physical proximity can escalate potential protests.*** For example, if a kid is humming in an annoying way, a typical teacher move might be to make eye contact with the child and shake your head to get him to stop. But in this situation eye-contact is non-verbally asking the child for a response, which he may be incapable of giving at that moment. Instead, calmly walk over and put a note on his desk that says, "please stop humming." Then run away and do not make eye contact with that student for a few minutes.

"The initial reaction is not pleasant and you have to wait for them to de-escalate before they can comply," Minahan said. Sometimes the mere presence of the teacher prevents that de-escalation.

Tip 20: Reward practice or strategy use, not performance. "When I shift the reinforcement to skills, I've noticed the skills go up and that's what makes the difference for the kids who have mental health difficulties," Minahan said. Ultimately, educators are teaching kids the skills and strategies that they can then use throughout their life when they're anxious, so rewarding practice makes sense.

The more teachers can empathize with students, teaching skill building and focus on preventing challenging behavior, the smoother the classroom will run. Often that means learning about the student in order to identify triggers and design new ways of interacting with even the most challenging students. *An earlier version of this post overstated the connection between bad behavior and seeking attention.

**An earlier version of this sentence highlighted only one type of negative behavior -- fighting.

*** This section was updated to include the situations under which eye contact could make a situation worse for a student. We regret these errors.

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and when it's negative it almost always stems from an underlying cause. There are many reasons kids might be acting out, which makes it difficult for a teacher in a crowded classroom to figure out the root cause. But even if there was time and space to do so, most teachers receive very little training in behavior during their credentialing programs. On average, teacher training programs mandate zero to one classes on behavior and zero to one courses on mental health. Teacher training programs mostly assume that kids in public schools will be "typical," but that assumption can handicap teachers when they get into real classrooms.

A National Institute of Health study found that 25.1 percent of kids 13-18 in the US have been diagnosed with anxiety disorders. No one knows how many more haven't been diagnosed. Additionally between eight and 15 percent of the school-aged population has learning disabilities (there is a range because there's no standard definition of what constitutes a learning disability). Nine percent of 13-18 year-olds have been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) (although the number one misdiagnoses of anxiety is ADHD), and 11.2 percent suffer from depression.

'We are 50% of every interaction with a child, so we have a lot of control over that interaction.'

"So basically we have this gap in teacher education," said Jessica Minahan, a certified behavior analyst, special educator, and co-author of *The Behavior Code: A Practical Guide to Understanding and Teaching the Most Challenging Students*. She spoke to educators gathered at a Learning and the Brain conference about strategies that work with oppositional students.

Minahan is usually called into schools to help with the most challenging behavior. She finds that often teachers are trying typical behavioral strategies for a group of kids for whom those strategies don't work. However, she says after teachers learn more about why kids are behaving badly there are some simple strategies to approach defiant behavior like avoiding work, fighting, and causing problems during transitions with more empathy.

ANXIETY

Anxiety is a huge barrier to learning and very difficult for educators to identify. "When anxiety is fueling the behavior, it's the most confusing and complicated to figure out," Minahan said. That's because a student isn't always anxious; it tends to come and go based on events in their lives, so their difficulties aren't consistent. When we are anxious our working memory tanks, making it very difficult to recall any salient information.

Researchers surveyed a group of first graders none of whom had any reading or math disabilities. Those who had been diagnosed with an anxiety disorder were eight times more likely to be in the lowest achieving group in reading, and two-point-five times more likely to be in the lowest quartile in math achievement by the spring.

"Anxiety is a learning disability; it inhibits your ability to learn," Minahan said. But it isn't usually recognized as a learning disability and there is almost never a plan for how to address it in the classroom. "For kids with anxiety, the 'can'ts fluctuate," Minahan said. "When they're calm they can. When they're anxious they can't. And that's very deceiving."

Anxiety isn't about ability, it's about interference, which means that traditional rewards and consequences don't often work with this group of learners.

"Rewards and consequences are super helpful to increase motivation for something I'm able to do," Minahan said. But an anxious person's brain has shut down and they aren't able in that moment to complete the task being asked of them. The best way to combat this tricky problem is to try to prevent anxiety triggers and build up students' social and emotional skills to cope with the moments when anxiety sets in.

When kids are in the throes of bad behavior they have poor self-regulation skills, often get into negative thinking cycles that they can't stop, have poor executive functioning, become inflexible thinkers and lose social skills like the ability to think about another person's perspective. That's why kids can seem so unempathetic when teachers ask, "how do you think that made Sam feel?" At that moment, the student acting out has no ability to take Sam's perspective, but a few hours later or the next day, he might be able to show the remorse educators want to see.

ALL BEHAVIOR HAS A FUNCTION

Bad behavior is often connected to seeking attention, and when kids act out, they can see the results.* "Negative attention is way easier to get and hands down easier to understand," Minahan said. "It's much more efficient." Adults tend to be unpredictable with attention when a student is doing what she is supposed to do, but as soon as there's a dramatic, obvious tantrum, the student has the teacher's attention. And negative attention is powerful - one student can hijack a whole classroom.
A common teacher response to low-level negative attention seeking is to ignore the student. The teacher doesn't want to reward bad behavior. "I want to caution you about ignoring someone with anxiety because their anxiety goes up," Minahan said. Ignoring an already anxious student can accidentally convey the message that the teacher doesn't care about the student, and worse might escalate the situation. Perhaps a teacher can ignore a student tapping his pencil or banging on his desk, but threatening behavior can't be ignored. And the student learns exactly what level of behavior he must exhibit to get attention.

TIP 1: Instead, "what you need to do is make positive attention compete better," Minahan said. She often suggests that teachers actively engage the most difficult student at the beginning of class saying something like, "I can't wait to see what you think of this assignment. I'm going to check on you in 5 minutes." When the teacher actually comes back in five minutes, validates the student's progress, and tells her another check-in is coming in ten minutes it sets up a pattern of predictable attention for positive behavior. And while it might seem unfair to take that extra time and care with one student, it ultimately saves instruction time when a teacher doesn't have to deal with a tantrum that sends the student out of the room.

TIP 2: Often in an attempt to form a positive relationship with a student teachers will publicly praise positive behavior. That can backfire, especially with anxious kids who don't want any extra attention from peers. Private or non-verbal praise is often better. Minahan recommends pulling students aside at the beginning of the year to ask how teachers can best tell them they're proud. "It's a gift to your February self if you can figure out a system now, otherwise you'll get stuck on the negative attention scale," Minahan said.

Tip 2.1: She also recommends fact-based praise as opposed to general praise. Vague praise is easy to dismiss.

ANTECEDENTS TO BAD BEHAVIOR

Many kids have predictable anxiety triggers like unstructured time, transitions, writing tasks, social demands or any unexpected change. Similarly the antecedents of negative behavior are fairly predictable: unfacilitated social interactions, interaction with an authoritative adult, being asked to wait, when demands are placed, being told no, writing, and transitions.**

Tip 3: "Teach waiting now," Minahan said. "When you are anxious, despite your age, it's very hard to wait." She was asked to observe a boy who constantly disrupted class. Minahan soon noticed the boy often did his work, but if he finished early or there was downtime in the class, he would start causing trouble. When Minahan pointed this out to him he had no idea what "wait time" was. She had to spell out to him that when he finished a task he should apply a strategy, like turning over the paper and doodling appropriately on the back. After this small intervention the student's behavior was so improved that his teacher thought he'd gone on medication.

'You can have really bright, able children whose anxiety is interfering so much.' with anxiety, there are a

number of strategies teachers can employ. The first is not to take any student behavior personally. The student isn't trying to manipulate or torture the teacher, his behavior is reflecting something going on internally. Often a short movement break can help relieve anxiety, but not the way they are commonly given.

For kids

Minahan described a seventh grade girl who was recovering from an eating disorder. The girl was scraping her arms so badly they would bleed. After lunch, predictably, the behavior was worse, so her teachers were letting her color and draw to relieve her anxiety. Another common break is to tell a student to go get a drink of water down the hall. The coloring break wasn't working for this seventh grader and Minahan soon figured out why. "We accidentally left her alone to fester in her anxious thoughts," she said.

Tip 4: Leaving class doesn't give the student a break from internal negative thoughts like "I'm fat," or "I'm not smart enough," which paralyze thinking. But a break paired with a cognitive distraction does offer respite from the "all or nothing" thinking that's so common with anxious students. An older student might take a break and record herself reading a book out loud for a younger student with dyslexia. It's impossible to read out loud and think another thought. Other distractions could include sports trivia, sudoku or crossword puzzles. Little kids might do a Where's Waldo or look through a Highlight magazine for the hidden picture.

Tip 5: When teachers want to wrap up a task they often use a countdown. "Silent reading time is going to be over in five minutes." But counting down doesn't support a high achieving anxious child who feels she must finish. And it takes a lot of executive function skills and cognitive flexibility to fight the urge to keep going after the time is up. So instead of counting down, a teacher might walk over to that student and say, let's find a good stopping point. She may stop a minute later than the rest of the class when she reaches the designated point, but it won't escalate into a tug-of-war.

Transitions are another common time for kids to act out. Younger students often don't want to come in from recess, for example. But when a teacher says, "Line up. Recess is over. It's time for your spelling quiz," it's no wonder the student doesn't want to go from something he loves to something he hates.

Tip 6: The teacher can give students an in-between step to make the transition more palatable. Go from recess, to two minutes of coloring, to the spelling quiz. The intermediary step gives that non-compliant student behavioral momentum. He's already sitting down, quiet, with pen in hand, so the jump to spelling isn't as jarring.

For middle and high school students, school is all about being social, but the only times students get to see their friends are in the two to five minute passing periods between classes. Again, the transition is from something they love to something they hate, so don't make that transition extra hard by collecting homework as they come in the door. The toughest kids are probably already not doing well in the class, and a reminder of the homework exacerbates feelings of inadequacy.

Tip 7: One high school geometry teacher started playing two minute YouTube videos about geometry as students came into class. It got students from the hallway into the classroom without thinking negatively and her class started to run more smoothly. She didn't have the same interruptions she used to, which made the lost two minutes seem worth it.

Tip 8: Minahan also likes some of the biofeedback tools that are now available, like the EmWave. A wound up student puts a sensor on his finger and calming down becomes a game. He might start out with a picture of a black and white forest, but as he calms down (and the sensor monitors his heart rate) the colors start to pop in. It can take as little as two to five minutes to completely calm a kid down when they can see the feedback so clearly.

"I like it because it's so concrete," Minahan said. A student with high functioning autism might not even know what a teacher means by "calm down," but with the biofeedback device she can see what it means.

WORK AVOIDANCE

Minahan says it's very common for students to have trouble initiating work, persisting through work and asking for help, but there are strategies to help kids build the skills to get better in these areas.

"You can have really bright, able children whose anxiety is interfering so much," Minahan said. The anxiety isn't coming from nowhere; it's coming from prior experiences of feeling frozen and stupid. In that moment the child's working memory isn't working, so teachers need to find ways to bypass it until the anxiety passes.

Tip 9: One way is to let students preview the work for the day. In the morning, an elementary school teacher might work on the first few problems with the anxious child so she knows she can do it. Then, when it's time for that work later in the day, that child receives the sheet she's already started and can go from there.

Tip 9.1: In high school, teachers can give students with trouble initiating the preview as homework. Students can start at home without any pressure and continue at school. "Fight or flight is the worst when they first see it," Minahan said, so try to bypass that moment and prevent a breakdown.

Tip 10: At the same time, when the teacher names the strategies a student is employing, he is helping the student build a toolbox that can be used independently. Strategies might include, asking a teacher to help her start when she feels frozen, or asking to preview the homework. For perfectionist students, difficulty starting can stem from a fear of messing up. Give those students dry erase boards, where the mess ups can be easily erased. It helps when teachers treat the difficulty starting as a small problem and say something like, "Looks like you're not initiating. What strategy are you going to use?"

'When I shift the reinforcement to skills, I've noticed the skills go up and that's what makes the difference for the kids who have mental health difficulties.'

Tip 11: Some strategies to build persistence include skipping the hard ones and doing the ones a student knows first, working with a buddy, and double checking work on problems that have been completed.

Giving help in class is often a tricky balance, especially if a student is too embarrassed to ask vocally. Instead of acting out because she can't do the work, the student might raise her hand, pass the teacher a note or make eye contact. Then the teacher has to be careful not to give too much help. "We accidentally create dependency because we help so much," Minahan said.

That goes for academics as well as behavior. Often a teacher will notice a student becoming agitated and dysregulated and tell him to take a short walk. But ultimately the student will be better served if he can learn to monitor himself and implement strategies when he notices early signs of agitation. "Kids have to learn how to catch themselves on the way up and calm down there," Minahan said, because that's when the strategies work. But kids need to be taught how to recognize the signs.

Tip 12: Teach kids how to do a body check. With younger students a teacher can describe the signs of agitation as they are happening so the student starts to recognize them. With older students, ask them where in their body they feel anxious, for example, "in your belly?" "Give them the data every day," Minahan said. "This is your body on the way up." After the groundwork has been laid, a teacher can just say "body check, please" to let a student know it's time to check in with themselves and start using a strategy.

But what can you do when a kid is already exploding? Minahan says, not much because the child will have a very hard time reacting in a reasonable way once he or she is riled up.

Tip 13: What educators can do is anticipate those moments and rehearse self-calming strategies when the child is calm.

In one case, Minahan knew an elementary student she was working with was going to have a traumatic change in her life. The child's mom was giving her up to foster care and the date had been set. To prepare for what would undoubtedly be a moment when the student couldn't control herself, Minahan had her practice self-calming in the social worker's office, where she would probably go on the day. Twice a day for five minutes she rehearsed a self-calming routine when she was already calm so her working memory was available and she was learning the strategies.

When the day came and the child did freak out, Minahan quickly got her into the office with very little touching or verbal interaction which might further set her off. Once there, the girl got into her routine, and started singing to herself as a cognitive distraction. "The rehearsal allowed for automaticity and did not require cognition or working memory in that moment," Minahan said.

Tip 14: Rehearse replies to confrontations. Minahan worked with a high school student who constantly got in fights. If he felt disrespected he'd start swinging. Together they rehearsed over and over him saying, "I don't have time for this," and walking away. During the rehearsals, Minahan gave him something to hold in his hands as he said this. And soon, he stopped getting in fights. It gave him the moment he needed to make a decision not to use his fists and a go-to automatic reply.

Tip 15: Use data to disprove negative thinking. Writing is a common barrier for kids with anxiety, Minahan said. But one way to begin getting students past this hurdle is to ask them how hard a task will be before they start and again after they've completed it. Almost always the perception of the task is worse than the actual task. With several weeks of data you can show students the pattern in their responses.

Minahan worked with a girl who hated writing so much that she was skipping school twice a week. She would often say that writing was torture to her. Minahan broke writing down into component parts with corresponding strategies for getting started on each part. When the student worked on a writing task Minahan would ask her how many strategies she employed. Often the girl didn't use that many strategies, which didn't fit with her own conception of herself. "We reframed her whole thinking and she felt more empowered to solve her problems," Minahan said.

INTERACTION STRATEGIES

In any interaction with students teachers can only control their own behavior, but that's actually a lot of power. "We are 50% of every interaction with a child," Minahan said. "We have a lot of control over that interaction."

Tip 16: If a teacher gets off on the wrong foot with a student early in the year, try randomly being kind to the child, rather than only giving positive attention based on his or her behavior. This kind of noncontingent reinforcement helps the child to see the teacher likes him for who he is, not because he does math well or reads perfectly, Minahan said.

Tip 17: In areas where the difficult student is competent, give her a leadership role. Maybe let her take a younger child to the nurse or start an activity club. This helps change the child's perception of herself and also her relationship to the teacher.

Tip 18: When demanding something of a student, don't ask yes or no questions and teach kids not to ask yes or no questions. In that scenario, someone has a 50 percent chance of being disappointed with the answer. By changing the question, the teacher opens the door for the answer to be diffusing, rather than an escalation of defiance. For example, if a student asks, "Can I work with Jack?" The teacher can reframe the question: "Oh, did you want to know when you could work with Jack? You can ask: When can I work with Jack." The student might not like the answer, but it likely won't produce the same explosive reaction as getting an outright "no."

Tip 19: Give kids time and space. If a student is prone to arguing, eye contact and physical proximity can escalate potential protests.*** For example, if a kid is humming in an annoying way, a typical teacher move might be to make eye contact with the child and shake your head to get him to stop. But in this situation eye-contact is non-verbally asking the child for a response, which he may be incapable of giving at that moment. Instead, calmly walk over and put a note on his desk that says, "please stop humming." Then run away and do not make eye contact with that student for a few minutes.

"The initial reaction is not pleasant and you have to wait for them to de-escalate before they can comply," Minahan said. Sometimes the mere presence of the teacher prevents that de-escalation.

Tip 20: Reward practice or strategy use, not performance. "When I shift the reinforcement to skills, I've noticed the skills go up and that's what makes the difference for the kids who have mental health difficulties," Minahan said. Ultimately, educators are teaching kids the skills and strategies that they can then use throughout their life when they're anxious, so rewarding practice makes sense.

The more teachers can empathize with students, teaching skill building and focus on preventing challenging behavior, the smoother the classroom will run. Often that means learning about the student in order to identify triggers and design new ways of interacting with even the most challenging students. *An earlier version of this post overstated the connection between bad behavior and seeking attention.

**An earlier version of this sentence highlighted only one type of negative behavior -- fighting.

*** This section was updated to include the situations under which eye contact could make a situation worse for a student. We regret these errors.

Helping Anxious Students Move Forward

Strategic accommodations can help students with anxiety develop persistence and independence.

Jessica Minahan

itting across a graffitied desk from me, an exasperated 9th grade English teacher says, "We've given him every chance!" She's talking about Jeremy, a basketball star by all accounts, who is bright but getting little to no homework or schoolwork done and spending more time in the bathroom than in his classes. "Basketball is his only love, and many of us hope it is his ticket out of the inner city," the teacher tells me. The teacher also explains that Jeremy has a diagnosis of generalized anxiety disorder and has been struggling with academic performance and work engagement since elementary school.

The school's guidance counselor told Jeremy that unless his grades improved, he wouldn't be allowed to play basketball. Unfortunately, his grades did not improve and Jeremy was kicked off the team in January. He ended the school year failing all but one course.

Anxiety disorders are extremely prevalent among children and adolescents in the United States. With 31.9 percent of adolescents having had an anxiety disorder at some point in their lifetime, anxiety is the number one mental health concern that educators and counselors face (Merikangas et al., 2010). Yet most teacher preparation programs only mandate one course (or none at all) in behavior and mental health principles. Overwhelmed teachers like Jeremy's are trying, but lack the training to help their students adequately.

Work Avoidance Is *Not* an Issue of Motivation

In my work as a behavior analyst and consultant, I see work avoidance at all grade levels: a 1st grader staring at the wall during reading group, a 5th grader asking to see the nurse when she's called on in class, an 8th grader putting his head down and disengaging during independent math work. Many people might think this behavior indicates a lack of motivation, especially when attempts at incentivizing the student don't work. That's what it *looks* like.

And yet if we consider Jeremy's plight, we see this isn't true. Despite his anxiety, Jeremy couldn't have been more motivated to play basketball. Yet that wasn't enough. Why?

Though extremely motivated and academically capable, Jeremy lacked four crucial executive functioning and emotional skills:

• Accurate Thinking: The ability to look at an assignment or situation and accurately judge its difficulty, the time it will take to complete, and one's own ability to engage in and complete it.

■ *Initiation*: The ability to organize one's thoughts and start engaging in a task.

• *Persistence*: The ability to sustain effort, even when faced with a mistake or difficulty (perceived or real).

• *Help-Seeking*: The ability to ask for help when difficulties arise (rather than avoid the task or feel defeated).

Penalties and incentives don't teach these skills and are unlikely to improve students' behavior. Instead, they often leave students like Jeremy feeling misunderstood and rejected. What is more helpful for students with anxiety is to teach them *how* to engage in work and to develop these skills.

Teaching Skills for Work Engagement

When we teach our children to ride a bike, we give them training wheels. Similarly, we should provide accommodations, such as placing math problems on cards on a key ring so students see one problem at a time instead of a long worksheet, to support students while explicitly teaching work engagement skills. Providing students with accommodations supports their ability to think accurately, initiate, persist, and seek help, allowing them to succeed while they are building these skills. If we remove the supports before students are ready, they'll crash.

Accurate Thinking

Behavior occurs for a reason. Work avoidance behavior-putting your head down on the desk-is the behavior we notice, but it is often precipitated by mild avoidance behaviors and an invisible series of negative thoughts. Students with anxiety or depression are at a particular risk for these kinds of inaccurate thoughts. Students may create an all-or-nothing situation in their minds ("I hate math" versus "I struggle with multiplication"), which can cause defeat before the student even begins. Another common version is catastrophic thinking ("I don't know how to do the third problem, so I'll probably flunk 6th grade"). Because thoughts are invisible, it is important that negative thinking should be measured-not assumed-through data gained from interviews and thought journals.

One approach to turning negative thinking into accurate or positive thinking is to have the student rate the difficulty of a writing assignment before and after the activity (Minahan & Schultz, 2014). Before the activity, the student might rate it "very difficult" due to his anxiety-fueled perception, but an hour after completion, he'll likely have a more accurate perception and assign a lower number. Referring him back to those ratings may shift his mindset for future work.

Another strategy is to create a chart that breaks a task into parts (Minahan, 2014). Make a list of different task parts, mixing in neutral items (writing lower case letters, using punctuation), favorite things (drawing, telling a friend about my idea), and some aspects they dislike (spelling). Then have students categorize each of the items into one of three columns: "I like it," "It's OK," and "I don't like it." Show the chart to the student when she makes an all-or-nothing statement such as, "I hate writing!" You can reframe by saying, "Actually it seems you *like* writing. Are you having trouble thinking of an idea? That's a small problem. I can teach you how!"

These strategies give the student a realistic view of tasks and isolate the exact skill that's a challenge. Combined with reframing language, it reduces the student's all-or-nothing thinking, empowering both student and teacher (Chambers, 2017).

Initiation

Have you ever asked a student to start work, only to realize a few minutes later that she is staring into space? If you offer help at that point, you may find that the child has already been wallowing in negative thoughts and is on the verge of shutting down. It isn't realistic to ask negative-thinking, anxious students who lack initiation skills to begin work independently. Instead, we must help them start and then ask them to continue on their own.

If teachers can assist the student within the first 30 seconds of assigning materials, they can help dissuade negative thinking (Minahan, 2014). Another helpful strategy is to look at the assignment together earlier in the day—or even the day before: "This is the math sheet we'll be doing later. Let's start the first and second problem together."

Chunking (breaking work into smaller pieces) can also help students with low initiation skills. Give them one sheet at a time instead of the whole packet, or tell them to do only the even-numbered problems. If a student still doesn't engage, teachers can give the student a math sheet that Have you ever asked a student to start work, only to realize a few minutes later that she is staring into space?

is completed except for the last few problems and ask the student to finish it. This is actually more effective than giving them a blank sheet and asking them to do only the first five because the sheet *looks* almost finished and easier to complete. It gives the student a sense of completion and gratification and can bypass negative thinking.

For a writing assignment, try filling in the first sentence and first half of the second. Stopping in the middle of a word, mid-sentence, is a great way to get the student to continue. He can be taught to stop mid-sentence so when he returns to the assignment it'll be easier to keep working.

For students who are risk-averse or perfectionistic, provide a whiteboard for writing. Teachers can also put worksheets in a transparent sleeve and allow students to use a dry-erase marker. In middle or high school, provide a second copy of a paperbased quiz to remind students that mistakes aren't permanent.

Persistence

Teaching and nurturing persistence can be accomplished using psychologist Carol Dweck's growth mindset theory, which teaches students that

FIGURE 1. Self-Monitoring Strategy Sheet

What am I worried about?	What strategy can I use?	Did I use it?
Initiation My thoughts might be This looks difficult. This is going to take forever. I can't do it.	Ask a teacher to help me start. Use a wipe off board instead of paper. Skip the problem I'm stuck on and try another. Change seats so I am away from distrac- tions. Tell myself I only need to do work for two minutes and then I can take a break. Tell myself I only need to do the first five items and then take a break. Use positive self-talk.	
Persistence <i>My thoughts</i> <i>might be</i> This is too hard. I need to stop.	Skip the hard problems and do the easy problems first. Work with a classmate. Check the problems I've completed. Take a quick break. Pair the task with something pleasant (comfy chair, listening to music). Picture the completed product.	
Help Seeking My thoughts might be I don't know how to do this. I forget how to do this.	Raise my hand. Hand the teacher a note. Look in my notebook. Ask a classmate or ask to work with a classmate.	

"every time you push out of your comfort zone to learn hard things, your brain grows new connections and you get smarter" (Dweck, 2006).

Rewarding persistence, not just product, can prevent students who work hard but don't earn great grades from "turning off" and not bothering to try. Do this by focusing part of the grade on *small* evidences of persistence, like, "Did I attempt more problems today than on my last quiz?" "Did I correct an answer?" "Did I attempt one of the challenge problems?" This allows a disengaged student to focus on effort and not be intimidated by a need for correctness.

Help-Seeking

Students with anxiety or depression may lack the initiative to ask for help when they're stuck or overwhelmed by a task, and instead feel defeated and give up (Minahan, 2017). In some students, it could be that they are embarrassed about asking. Pull them aside and decide on a nonverbal or private system they are comfortable with, such as putting a pencil behind their ear when they need help.

Once we get students to ask for help, the next step is to assist the student to reflect on and articulate specifically what they need to reduce dependency. While talking, they may realize there's another strategy available. When a teacher won't accept the nonspecific request for "help," and instead requires students to answer, "What do you need help with and why?", students are forced to look more closely at the challenge. In articulating, "I don't remember the formula," a student may realize the problem is one he can solve himself by looking in his math book. The teacher can then reinforce that independence by saying, "Great! You didn't need help! I'm glad you figured it out."

FIGURE 2. Independent Work Inventory

Input	Output	
Watching a movie	Verbally answering questions	
Listening to a recorded book	Playing content-specific cause/effect games on iPad	
Reading one line	Circling multiple-choice answers	
Reading one paragraph	Circling true/false answers	
Reading two paragraphs	Filling in the blank	
Reading two to three pages	Writing a one-sentence answer to an open-ended question (indicated by one line)	

The flip side of this is that some students respond to anxiety by asking for help too frequently. Jeremy's classmate Monique always asked, "What do I do?" immediately after being given directions. When the teacher asked her, "What were the directions?" she would be able to repeat them perfectly. This type of help-seeking is actually reassurance-seeking, and making this distinction is important to building students' self-awareness. Helping them replace, "I don't know what to do," with "Can I have a check-in with you?" or "Did I understand the directions correctly?" will promote anxious students' more accurate and confident self-concept.

Increasing Independence

When all reminding and prompting attempts have failed, teachers commonly sit with reluctant students and plod through the assignment with them without explicitly teaching strategies. However, working one-on-one or profusely prompting them through each task can cause dependence.

A better strategy is to teach students how to self-monitor. If students can

learn how to assess their own needs and find the strategies to get help, they will not need to overly rely on the teacher. Figure 1 (on p. 47) shows an example of a self-monitoring sheet that visually lists strategies a student can use independently to initiate, persist, and seek help. For students who seek reassurance, teachers can add options such as "Ask the teacher for a check-in," "Ask three classmates before asking the teacher," or "Reread the directions." This type of chart can be made into a class poster for all to reference.

Even with teachers' daily suggestions of strategies to help students solve problems independently, most students still believe that asking the teacher for help is their best tool when they are stuck. For that reason, the teacher needs to be persistent in referring to the self-monitoring sheet when prompting a student to solve problems independently. First, the teacher can label the struggle as one of the small skills, such as, "Looks like you are having trouble initiating." This reframes the student's all-or-nothing thoughts into smaller, easier-to-tackle problems he can solve independently. Teachers can then point to the strategies column on the chart and ask the student which strategy he's going to use to solve his own problem, saying, "Show me the strategy you've chosen to help yourself." The teacher can provide guidance if needed, but the student is gaining independence.

Independent Work

Often, I see a teacher work with students in a small reading group or oneguidance on how to gradually increase students' level of input/output as they show signs of success. For example, students may be intimidated by reading an entire chapter of a book, but might be able to easily listen to an audio book. They may fail fill-inthe-blank quizzes, but be excellent at verbally answering questions in class. If you can identify where they are on the inventory, then you can meet them there and help them succeed independently.

If, however, a student's independent

Penalties and incentives are unlikely to improve students' behavior. What is more helpful for students with anxiety is to teach them *how* to engage in work and to develop these skills.

on-one and then ask them to finish the assignment independently, only to be surprised when the students go off-task or become disruptive. The frustrated teacher often feels a particular student *can* do the work, as evidenced by his earlier production with her, so she assumes that he must be choosing *not* to do work back at his desk.

The teacher does not realize that she was essentially giving the student help without his asking for it, thereby preventing him from developing his initiation and persistence skills. Without the initiation, persistence, and helpseeking skills necessary to tackle the assignment independently, he becomes stuck and avoidant.

So how can she help him? An input/ output inventory (see fig. 2) can help teachers think about where to meet students so they can be successful independently and give teachers work skills are at a lower level than his capability in a supported environment, then we'll likely see work avoidance or disruptive or challenging behavior. Like a helium balloon, if the student is not tied to the structure of work, he'll float aimlessly. Meeting students where they are independently and systematically introducing more difficult methods of showing knowledge is the only way to shape behavior toward success while building work tolerance and skills.

For example, one day in class, Jeremy's teacher asked students to conduct research on the computer and answer two open-ended questions on a sheet of paper. Instead, Jeremy was scrolling through social media and encouraging classmates to join him. The teacher eventually asked him to leave the room. When meeting with Jeremy's team, I asked, "How often does Jeremy complete open-ended writing independently?"

"Never!"

His teachers were overshooting the method of output. Looking at work samples, we found Jeremy wouldn't engage in reading when there were more than two paragraphs on the page. I suggested they accommodate the work, requiring him to read only one or two paragraphs. I also suggested accommodating assignments from open-ended questions to multiple-choice. Jeremy's history teacher agreed to try this, and within five weeks, Jeremy was completing work and beginning to improve toward reading one page of text in a book and completing fill-in-the-blank answers. Jeremy told the principal, "It's like I'm a student! I hand in work and get graded." History was the one class he passed that term.

Simple changes, like increasing the font size of an assignment, can help a student think the task is less difficult. Students sometimes can find pencil-and-paper tasks intimidating, but almost all assignments or concepts have a non-paper equivalent that may be less off-putting (for example, a math game on a tablet or laptop). Being patient and flexible is also keystudents' abilities may fluctuate daily, depending on underlying levels of anxiety. On Monday, they may need to take a step back, while on Wednesday they can continue to move toward more difficult methodology.

Teachers readily reduce or accommodate the way we give assignments to students with dyslexia, dysgraphia, or visual impairment, but we don't always think to make such accommodations for students with anxiety or other emotional disabilities. By meeting students where they are and systematically increasing the difficulty with support—while teaching initiation, persistence, and help-seeking skills—we build independent work tolerance.

To embrace the skill-building approach to work engagement and to expedite the learning of initiation, persistence, or help-seeking skills, recognize and celebrate when students use strategies instead of focusing on whether they did the work. This promotes independence and generalization of the skills, allowing teachers to increase learning time and meet the needs of *every* student.

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Video Extra

In this short interview conducted at ASCD Empower17, behavior analyst Jessica Minahan describes specific and counterintuitive ways teachers can help students who experience anxiety so it doesn't thwart learning. Watch the video at www.ascd.org/el1217minahan.

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Verbal Mediators: The Language of Executive Function

Edited by: Kristen Jacobsen & Sarah Ward, MS CCC-SLP

Declarative Language

Authored by: Linda Murphy

Why is Declarative Language so important in fostering Executive Function Skills?

- 1. Inner Voice: Self-narratives help students develop an inner voice. After the initial language spark is ignited, most of us then go on to develop our own voice that we use to share our thoughts, recap experiences, talk about what we are doing, and talk about what we are thinking. Most of us also then go on to create our own inner voice. This is an important by-product of our language learning. We use our inner voice to problem solve and plan. We remember what we have learned or noticed in the past, and apply it to the here and now. For example, imagine you are getting ready to go to work and you can't find your keys. Your inner voice may say something like, 'Hmmm.... Now when did I last see my keys? Where do I usually put them down? What jacket did I have on yesterday?... Maybe they're in the pocket." Your inner voice helps you think through the problem so you can get started on a plan of action to solve it. Children with Executive Functioning difficulties do not usually develop this inner voice to regulate their thoughts and actions on their own. Just as modeling was important when your child was learning to talk, thoughtful modeling now, in this regard, is equally important. So – talk out loud, think out loud, work through a problem, make predictions, ponder opportunities, consider possibilities, and reflect on past experiences when you are with your child. They will learn from your models, internalize the ideas, and begin to form their own inner voice.
- 2. **Perspective Taking:** Provide a window into another person's perspective. Some children with executive function challenges have difficulty taking perspective. Using declarative language to share your thoughts and feelings provides a student with a regular window into these communication exchanges in an inviting, nonthreatening way. We are providing them information that is critical in a social interaction that we know they may not pick up on their own. When we present declarative language in this way, we are not asking them to provide an answer that may be right or wrong. Rather, we are clueing them into social information and then allowing them to decide what to do with the information. By regularly using declarative language, we are also slowly building episodic memories and awareness that different people have different thoughts, opinions, perspectives and emotions. For example, you say something to your child but he is facing the other way, appearing not to listen. Rather than say to him "turn around!" or "look at me" (both imperatives) share your feelings and perspective with declarative language: "I notice you looking out the window", "What would help me know you are listening to me" or "I feel like you are not listening to me."
- 3. **Big Picture Thinking:** Students can better see the big picture in order to create multiple solutions to a problem. Declarative language can also help students create a visual image of the gestalt and how they would like to see the outcome of a situation in their "mind's eye". Often times when we focus on having students carry out specific detailed directions, we can all lose sight of the big picture. Because some children with executive

function challenges are strong when it comes to details, but weak when it comes to seeing the big picture, it is important to think about the big picture when we present information. Giving very specific directions or questions that have one right answer promotes that focus on details. For example, if we tell a child to "put the book in the book-box" or "line up at the door for music" we are zooming into the details and creating a situation where there's one and only one right answer. However, if we use language instead to comment on what we see in the big picture: "I see a book on the floor" or "what do you look like if you are ready to go to music?" - we are instead encouraging our children to take a step back, <u>notice the context</u> and situation around them, and subsequently form a plan of action that makes sense to them. We are also leaving open the possibility that there may in fact be more than one solution –i.e., maybe the toy could go on a shelf or in the toy box, maybe the students could put away their work, line up by the door, or collect their music instruments and line up by the door.

- 4. **Problem Solving Skills**: Declaratives support students ability to develop problem solving skills rather than merely than just following direction skills. When we direct students as to what to do, ask them to follow directions, or ask them to answer questions with a definitive right/wrong answer, we are honing their receptive language skills. This is not a bad thing, but it may not be what the student with an executive function challenge needs most. In contrast, if we use declarative language to present information about the environment or situation at hand, we are instead inviting her to notice this information and develop a plan of action. We are inviting him or her to have an "aha!" moment where he or she figures out what to do with given information. We are giving students an opportunity to think more independently! Problem solving moments are critical for all students as they learn to see themselves as more independently functioning human beings in the world.
- 5. **Read the Room:** Help your child read what's going on in his environment. We know that it can be difficult for some kids to tune into the social information that is going on around them. Rather than telling them exactly what to do and when to do it, use declarative language to help them notice what is important! For example, if it is time for a transition, instead of telling your child "go to the table for snack" or "put on your coat," direct his attention toward the changes in the environment: "I notice all the kids are at the table" or "I notice all the kids are putting on their coats." This will help internalize the importance of periodically checking in on one's environment; there are visual clues available all the time, and they are important to pay attention to! We want our kids to learn that information is not always going to come to them they have to become active information is coming to them on a regular basis, and they don't have the same need to look around or read the behaviors of others.

Job Talk:

Politicians wanted to increase voter turnout and turned to psychological research for help. It worked! Researchers framed voting as either a personal identity label (e.g. "be a voter") or as a simple behavior (e.g. "voting"). This change in phrasing to a personal identity label significantly increased interest in action and a substantially larger percentage of individuals voted! Research has shown that people want to feel like they are a part of something and take ownership of something rather than being told what to do.

Children are no different! Motivation to complete a task is increased by invoking one's sense of self. Subtly manipulating the verb form of a behavior ("Brush your teeth please") to feature a *noun label* (Annie is a toothbrusher!) creates an essential part of one's identity. In other words it creates confidence and a positive sense of self that this is "What I can do!" This subtle change in language can change an occasional behavior of helping around the house ("Please set the table.") into a child who has confidence in their permanent trait or skill (I am

a tablesetter!). When packing for a ski trip, being asked to be a 'packer' is a positive thing and requires the child to imagine in their mind "what does a packer do? What tools will a packer need?". On the other hand just asking a child to "Please pack the car with your warm clothing, boots and poles." Just asks the child to do something, does not invoke their reasoning of what is required and



likely does not fire them into action except perhaps to make excuses for why they can't! Using the declarative noun form (*clothes gatherer*) creates psychological essentialism and develops in children a positive attitude, a strong and stable sense of self and generalizes to how they perceive themselves and their essential role over time.



Sarah Ward, M.S., CCC/SLP and Kristen Jacobsen M.S., CCC/SLP have translated this research into a simple trick to help our children to take ownership of and participate in various tasks. They advise to turn the child's task into a "job" and add "er" to the action that you are asking the child to do which gives them the "job title" such as "Washer", "Wiper", "Tooth brusher", "Listener", etc. Give it a try, it's amazing!

Declarative Job Talk (Noun Form)	Imperative Verb Form	
Please be a handwasher!	Wash your hands.	
Be a counter wiper!	Wipe the counter off.	
Time to be a toothbrusher!	It is now time to go upstairs and brush	
	your teeth.	
You are getting ready to be a	Please take out your homework and start	
mathematician!	your math.	

Resources:

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Cleaning



Clean a Room (8-11 years old)

Develop and maintain a system of organization/cleaning (12-14years old)

Manage Laundry, Keep Dorm/Apartment clean, deep clean at reasonable intervals

Errands

Simple: get your shoes from the bathroom (3-4 years)

2-3 step direction put the placement on the table and then get the napkins (5-7 years)

With a time delay - to and from school w/out reminders (8-11years)

Follow complex school schedule & multiple transitions with teachers and classrooms (12-14 years)

Independently plan and follow school/work and leisure activities, drive own car

Self-regulation

Inhibit unsafe or inappropriate behaviors (3-4 years)

Inhibit behaviors; follow safety rules, use appropriate language (e.g. not swearing or using bathroom language when not appropriate), raise hand before speaking in class, and keep hands to self (5-7 years)

Inhibit/self-regulate behaviors; maintain composure when teacher is out of the classroom; inhibit temper tantrums and bad manners(8-11 years)

Inhibit rule breaking in the absence of visible authority (12-14 years)

Avoid reckless or risky behaviors (e.g. use of illegal substances, sexual acting out, shoplifting, or vandalism) (high school on)



EF Age:



Time



Understand sequence, past/present/future tense, causality (3-7 years)

Independently remember changes in daily schedule including different after school activities (8-11 years)

Follow complex school schedule involving multiple transitions with teachers and classrooms (12-14 years)

Plan time effectively, including after school activities, homework, family responsibilities (12-14 years)

Establish and refine a long-term goal and make plans for meeting that goal; collegiate or other vocational goals. Independently organize leisure time activities, including obtaining employment or pursuing recreational activities during the summer (high school)

EF Age:

EF Age:

Projects/Exams

Plan simple projects: e.g. book report: select book, read book, write report (8-11 years)

Plan and carry out long-term projects, including tasks to be accomplished and a reasonable timeline to follow (12-14 years)

Create, plan and follow timelines for long-term projects, tests, after school activities, family responsibilities

Study for tests, create and maintain learned material for midterms/finals (high school)

Papers

 Bring papers to and from school (5-7 years)

 Bring papers, books and assignments to and from school (8-11 years)

 Track belongings when away from home

Appropriately use a system for organizing schoolwork (12-14 years and beyond)

Homework

Complete -20 min max (5-7 years)

Complete - 1 hour max without assistance (8-11 years)

Manage schoolwork effectively on a day-to-day basis, including completing and handing in assignments on time – 2 hours (middle through high school)

Establish and refine a long-term goal and make plans for meeting that goal; collegiate or other vocational goals (high school)

Work

Simple chore - self care-brush teeth (3-4 years)

Simple chore/self help - make bed, make a bowl of cereal (5-7 years)

Chores 10-30 min in duration; set the table, vacuuming (8-11 years)

Help out with chores around the home, including both daily responsibilities and occasional tasks that may take 60-90 minutes to complete; emptying dishwasher, raking leaves, shoveling snow etc. (12-14 years)

Safely babysit younger siblings (12-14 years)

Part time work: house sit, dog walk, mow lawns Independently obtain employment and or work during the summer (late middle and high school)

Money

How to spend (5-7 years)

Save money for desired objects and plan how to earn money (8-11 years)

Save money to meet a financial obligation (college savings/spending money, car payment/insurance, etc.) (middle and high school)

Chronological Age

EF Age:







A Clinical Model for Developing Executive Function Skills

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Abstract

The purpose of this article is to describe a therapeutic program developed by our clinic that (a) considers the core features of executive control which must be understood in order to effectively implement an executive function treatment model, (b) how we included those features into a treatment program that successfully teaches students to develop independent executive function skills, and (c) demonstrates how the model has been applied across the developmental age span.

Executive Function

Self-regulation is essential for task execution and involves three key components: (a) any action that allows students to stop and direct themselves, (b) how this action results in a change in their behavior, and (c) how this behavior changes the likelihood of future consequences or the attainment of a goal (Barkley, 2012). This mental process of stopping and self-directing behavior is termed mimetic ideational information processing. The individuals essentially "mime the idea" in their minds and can even imagine a "dry run" of their impending actions to mentally simulate several possible future scenarios. In effect, it is a mental "trial and error." Once this mental image is created, using nonverbal working memory, the individuals can then use "self-talk" to direct their actions. In other words, when we ask students to listen and follow directions, we are really asking them to momentarily stop (inhibit) their own actions and thoughts to consider the *what, where* and *when* of the desired future, to compare this future with previous experiences, and to determine the value: why is it important, necessary, or motivating?

Individuals with weak executive functioning (EF) skills exhibit reduced visual imagery to see the future, a weak ability to control and sustain this visual representation over time, limited self-directed talk, disinhibition, a limited or absent ability to pre-experience the emotion of the future, disorganized planning, weak initiation, and reduced sustained attention (Barkley, 2012; Barkley, Edwards, Laneri, Fletcher, & Metevia, 2001). The collective outcome is a reduced ability to plan, organize, and control their behaviors for task completion. Some students may also have difficulty clearly envisioning what their future selves might look like when carrying out a routine in a given context particularly if it is a novel situation, which can also trigger negative

emotional responses (Barkley, 2012). For example, a student who is anticipating his first visit to a Mexican restaurant may not form a mental image of what it might look like, and therefore could become anxious due to the novelty of the situation. The ability to access an episodic memory for the schema of "restaurant" would enable the student to predict the expected core features of an unfamiliar restaurant: hostess station, tables/booths, place settings, menu, kitchen, and décor. This ability to shift from the concrete to the abstract to form pattern perceptions — to abstract the quality of a concept and use this quality in a new context to identify how a future image is the same, but different, from a previous experience — is one of the keys to developing strong executive function skills (G. Caine & Caine, 2006).

According to Barkley (2012), in order to develop or rehabilitate EF skills, individuals "need to repeatedly practice: self-monitoring, self-stopping, seeing the future, saying the future, feeling the future, and playing with the future so as to effectively 'plan and go' toward that future." Temporal capacity describes how far into the future students can consider to envision their goals and how they will use their time to attain their goals. Thus, clocks, calendars, and schedules are only a tiny segment of how students experience time in their lives. There are many hidden dimensions of time, and the language of how time is used to meet an end goal is often complex and abstract. Students need to develop strategies for the comprehension and production of time as it pertains to time management, complex planning, self-regulation/pacing, and temporal reasoning. All of these skills are developed during the daily events of a student's life, such as managing homework, initiating and completing morning and nighttime routines, organizing the steps to "get out the door," and arriving to class on time with the requisite materials. When supporting students through these daily events, we have found our approach helps them to develop the core temporal awareness skills that increase their gradual independence.

A common area of concern for both parents and teachers, and one that our EF treatment model has been designed to address, is a student's ability to initiate and complete tasks in allotted time frames. Some students may exhibit a delayed initiation while others may appear to race through an assignment or task. Students with temporal sequential processing weaknesses present with a poor concept of time, struggle to process temporal prepositions, and are slow to learn how to tell analog time (Wren, 2013). When students visualize and mentally manipulate the temporal sequence of steps in order to meet an end goal, they gain a sense of pace that is necessary for completing the parts and whole of a task. It can be a challenge for them to interpret multi-step directions and to understand complex syntax with temporal markers (e.g., the direction "*Before* you *quickly* go upstairs *first* put your homework away and don't forget to hand it in *after* lunch.") Thus, it was important that the clinical model of executive function present the student with the ability to see and sense a unit of time, as well as the big picture of a task before they executed a multi-step procedure.

Higher order thinking skills are also related to the skills of temporal sequential ordering. Many high-level cognitive functions are sequentially organized, such as understanding cause and effect, problem solving, and using conditional reasoning for inductive and deductive thinking when, in the moment, they are required to temporally organize their thoughts and actions in an online fashion to inhibit impulses, plan ahead, organize their actions, and complete academic/linguistic tasks requiring higher order thinking skills.

Given the above, it is not surprising that Barkley notes that, for a program to be effective to improve the development of EF skills, it is critical to "externally represent" or "remove gaps in time," to "externalize motivation," and to "intervene at the point of performance" (Barkley, 2012). Yet many of the current interventions to improve executive control are checklists/ contracts that focus the student's attention on the immediate or "now" of what they are doing. Although the past decade has led to progress in the research, development and documentation of interventions to improve executive control, there remains a need for evidence-based, effective intervention strategies to improve EF.

Core Components of the Clinical Model of Executive Function

The purpose of the clinical intervention described in this article was to pilot a service delivery model for students that could be used across settings to develop executive function skills in children that captured Barkley's definition that EF is self-regulation to sustain actions across time towards a goal (Barkley, 2012). Thus, our clinical model is an intervention that combines mimetic ideational information processing, situational and intention awareness, elements of temporal sequential ordering and higher order thinking to promote efficient and accurate completion of tasks within allotted time frames.

The Model

The Get Ready*Do*Done Model (GDD) (Figure 1) is a pilot methodology designed to teach students to develop situational awareness, create forethought of an end result, and then integrate all the materials, time and actions to complete a future task. It is based on 6 key principles of executive functioning:

- 1. Students must develop the capacity to use situational awareness and intention awareness to imagine a hypothetical future¹.
- 2. Nonverbal working memory (a private, visual/mental representation of the future) must predate self-speech (verbal working memory).
- 3. "If... then..." conditional reasoning plans must be used to create "distance" between the current "space" and "time" to the future "space" and "time." As a result, students will "see themselves" as agents of the action for the future goal being contemplated, which will provide time for a student to demonstrate self-restraint and impulse control (Gawrilow, Gollwitzer, & Oettingen, 2011).
- 4. Students must develop the ability to see and sense the passage of time.
- 5. Students must develop the capacity to self-monitor and adjust performance towards task completion.

To implement the GDD model (Figure 1) a student is given Get Ready, Do, and Done mats (Figure 2).

¹Situational Awareness (SA), as defined by authoritative expert on situational awareness Mica Endsley, is "the perception of elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Endsley, 1995). Howard took Ensley's definition even further to show that, in order for individuals to successfully demonstrate SA, they must also be able to account for the intentions of the others that share the same situation" (Howard & Cambria, 2013). This is deemed Intentional Awareness (IA).



Figure 1. The Get Ready*Do*Done Model with Steps Labeled

Figure 2. Get Read*Do*Done Mats Without Steps Labeled



The "Get Ready" mat is yellow, the "Do" mat is green, and the "Done" mat is red. The red "Done" mat signals students to imagine what something will look like in the end, and it also helps them visualize when to stop. The green "Do" mat signals students what to do, and it helps to remind the student to pre-plan what to do and then initiate or get them going on the task. The yellow "Get Ready" mat reminds students to slow down and to identify and gather the materials they need. The mats were preprinted and laminated or consisted of colored construction paper placed in plastic sleeve protectors. In this way, the students could use dry erase markers to write/draw on the protected mats and then erase as needed.

The GDD Model Stage 1: Task Planning

Done: What Will it Look Like? The process starts by asking students to put on their "future glasses," to start with the end in mind, and then imagine what they or the task will look like when they are all done. For some students, a pair of silly sunglasses are used and called

"future glasses" to serve as a physical mediator to facilitate and simplify the complex and abstract concept of forethought. Students are asked to sketch out this image, find a photo, or to verbally describe what it/they would look like. Using the visual image as a guide, the clinician coaches the students on how to break the image down from the whole, to the features, to the parts.

Do: What Steps Do I Need to Take to Get it Done? How Long Will Each Step Take? The students then use temporal sequencing skills to identify the steps required to match the future picture. The emphasis is placed on working backwards when planning and using an outcome to determine the relevant steps to achieve the visualized end result. Thus, when teaching the students the process of planning for task execution, it is important to choose therapy tasks that allow them to readily visualize or picture an outcome and, as such, eliminates the need for explicit instructions. In this way, students are responsible for looking at the pictured outcome and then using this visual to problem solve what steps are required to achieve their goals.

Students estimate the time needed for each step. It is important to note that when the time of a therapy session is limited, students can use dry erase markers on a clock (with a glass face) to sketch the total amount of time available and then fill in the time with the individual steps.

Get Ready: What Do I Need to Do? For each step, students use the future picture image and outlined set of steps to determine what materials are needed to complete the task. The planning for the maze project (Figure 3) and poster project (see Figure 4) are depicted below.





What materials do I need to

Figure 4. Poster Project: Task Planning Using the GDD Model



The maze project above included a picture model with the directions, so the picture was used in the "Done" mat. However, the poster assignment did not come with a picture model, which increased the complexity of planning for this task. The students needed to recall their previous experiences viewing and creating posters, and formulate an organized mental template of poster features based on those experiences. This mental template is used metacognitively to create a "future sketch" of the poster assignment. Thus, the student's mental imagery of the basic features of a poster, such as title, pictures, and captions are sketched as a template on the "Done" mat (see Figure 5 on the next page). The elements of the poster are represented as boxes and labeled. This "future sketch" is an external representation of the student's thinking that serves as the foundation for all the steps and materials that will be organized in moving toward that end result.

This is also a great time to pull in the directions and the rubric in order to complete the sketch by labeling all the components that the student will be graded on, as shown below. The completed sketch is then used to plan the specific steps and time for each step on the "Do" mat. It is beneficial for students to anticipate possible obstacles and use "if-then" thinking to consider solutions when engaging in the planning process. The time is then planned directly on the clock. Using a dry erase marker, a line is drawn from the center of the clock outwards to show when the task will begin and another line is drawn when the task is expected to end. A halfway checkpoint is marked on the clock, as well as on the "Do" mat to show which steps ought to be completed when halfway through the task. Continuing to work backwards, the materials that are planned required to do each of the steps on the "Do" mat are then listed on the "Get Ready" mat. Other resources such as parents, teachers, and student partners may also be listed on the mat.



Figure 5. Task Planning for the Poster Project: Elements of the Poster Sketched on the Done Mat

The GDD Model Stage 2: Task Execution

Get Ready. Students are asked to gather the requisite materials that are outlined. It is important to note that in therapy and home-based sessions, students are *not given* the materials. In order to increase spatial awareness, students are required to determine or make smart guesses about where the materials are likely to be kept and found in the given space. They are then instructed to go and gather those materials independently.

Depending upon the skill level of the students, materials are provided in the following hierarchy:

- 1. *Essential materials:* The specific materials needed to achieve the goal are provided in the space but gathered by the student.
- 2. *Irrelevant materials:* The required materials are provided. However, irrelevant materials are also available, requiring the student to use conditional reasoning skills to determine if, when, and how a material would or would not be necessary to achieve the final product. For example, if a student were making the aforementioned maze, the straws, box lid, and construction paper would be provided. In addition, in the materials selection area, irrelevant materials would also be present, such as a small box, wooden dowels (could be used for the maze, but cannot be cut with scissors), ping pong ball (too large), paint, etc.
- 3. *Missing Materials:* To develop problem-solving skills in this third condition, requisite materials are not provided. Students are required to look at the provided materials and problem-solve a material that could be used in place of the missing item. For example, straws may not be provided. Popsicle sticks, dowels, and paper may be present instead. The student must then problem solve the benefits of the Popsicle sticks (wide and easy to glue, but tricky to cut to size) vs. dowels (narrow, but require a small saw to cut) vs. paper (can be rolled and taped to create a cylinder-shaped material similar to a straw and then easily cut to size).
- 4. A key vocabulary concept taught in the "missing materials" condition is the idea of "same" but "different." Students are coached to identify the features of the required core materials and then determine which available materials are similar in feature.

Do. Using a dry erase marker on a clock with a glass face, students sketch the total "pie" or amount of time they estimate they would need to achieve the future picture. This enables students to see the volume of time available. On the clock, students also use the dry erase marker to create time markers: a starting time, an ending time, and midpoint check in. The students also mark in their plans what steps they hope to have achieved at the halfway checkpoint. Prior to initiating the plan, students are asked to use a timer as a mediator to self-monitor the passage of time. Timers can be any tool that counts down a volume of time including egg timers, easy set timers, timers on smart phones, and computer and mobile apps. The students set the timer to count down the amount of time to the halfway point, as opposed to setting the timer for the total amount of time to be spent executing the plan. When the timer is activated at the halfway point, students then have the opportunity to check in and self-monitor their performance. At the checkpoint, students compare their actual performance to their plan. Students are asked to identify whether or not they had any "time robbers" that "stole" their time. They are then coached to "identify and remove time robbers and then re-plan" their actions, time, or plan to sustain their actions towards achieving their future goal. Examples of time robbers would be hunting around in the class/clinic for materials to do an assignment, spending too much time texting or surfing the Internet, not having a clear focus of what an assignment is asking for, etc. By checking in at the halfway point, students are given the opportunity to self-monitor their performance and time. If necessary, they can then self-correct to achieve their plan within the allotted time frame, or they can adjust their time plan and/or expectations toward a more realistic future goal.

Done. Because students start with the end in mind, they already have a future reference for knowing when to stop and recognize when they have achieved their outcome. When finished, students are instructed to stop and "close out" the task they are working on. This includes throwing out trash, putting away unused and gathered materials, and cleaning their workspace. Depending upon the nature of the project, students can record their completed work in an academic agenda and then place their project or assignment in the appropriate folder or storage space until it has to be graded or turned in. This "Done" phase is also used as a time for the student to review the task, and their actions, and to determine: (a) What worked: these steps could be repeated, and (b) What did not work? What changes could be made to the plan when doing a similar task in the future? The maze project (Figure 6) and poster project (Figure 7) are depicted in the two sets of photos below.

Figure 6. Maze Project: Task Execution Using the GDD Model



Figure 7. Poster Project: Task Management Using the GDD Model



Check the Plan with Outcome When Done.





The last step includes comparing the actual final product with the plan. This student thought the poster was completed early and he was ready to stop and clean up. When he compared the actual poster with his plan, he realized that he was missing some details and he needed to continue working for several more minutes.

The GDD Model Used in the Clinic During a Social Skills Group

3. What Materials do we need?	2. Sequence the Steps What steps do we need to take to be done? How long will each step take? How much time do we Have? How will time fill up?	1. Future Glasses: When group is over, what will we see that we have completed?
 IPad Whiteboard Dry Erase Markers 	 Review the Steps for How to Join a Group. (5 min.) Create a Storyboard for the video. (5 min.) Choose Roles (actors, director and recorder). (2-5 min.) Rehearse action. (5 min.) Video Action. (10 min.) 	We have recorded and are watching a video about how to, and how not to, join a group.
4. Gather Materials	5. Sketch the time, create time markers and ½ way checkpoint. Set timer to alert ½ way point. Check in at the ½ way point and Determine if there are any Time Robbers: Identify/Remove/Replan	6. Know when to Stop. Close out the Task. Review: What worked? What did not work?

Table 1. GGD Model for Social Skills Group Session

Generalization to the Home Setting

To generalize the GDD Model to the home setting, parents are instructed in how the GDD model is implemented in the therapy session. They are then coached on how to support their children using the model at home. When a child needs to complete a task or craft project at home, the parent places on the work surface a piece each of yellow, green, and red construction paper. The parent then coaches the child to start planning with the end in mind by sketching a picture or finding a photo of the future outcome. A representative object could also be used. If, for example, a student were making a sandwich, a picture of a sandwich could be sketched or a photo printed and placed on the red "Done" mat. If the student were making a smoothie, an empty glass could be placed on the red "Done" mat to represent the future outcome (Figure 8).

Figure 8. GDD Model in Home Setting- Making a Smoothie



The child identifies the steps (Do) and materials (Get Ready) to achieve the future outcome and then gathers the necessary materials (Get Ready), sketches or verbalizes the available time, and then executes the steps of the task (Do). Finally, the child closes out the task (Done) by cleaning up the workspace and reviewing/comparing the planned vs. actual outcome.

Get Ready*Do*Done at School. The GDD model has also been successfully adapted to the school setting. Teachers are instructed on how to use the model, but implement it only when students need to focus on and complete an in-class assignment or task. Kindergartners were learning the sound/letter correspondence for the letter "M," so the students participated in a craft project and made a moose out of construction paper (Figure 9).

Figure 9. GDD Model in the Classroom



In a seventh grade special education classroom, co-taught by a speech-language pathologist (SLP), the class needed to complete a worksheet on calculating radius. The GDD model was presented on an active board as a ready reference for the students, and they successfully executed the task within the allotted time frame (Figure 10).

Figure 10. GDD Model in the Classroom—Calculating Circumference, Diameter, and Radius of a Circle



Preliminary Results

Performance results and efficacy of our clinical model are just beginning to be examined. Although our findings cannot be judged by standardized measures, descriptive analysis by clinicians, parents, and teachers suggests that the students who utilized the GDD model demonstrated an increase in task independence and an ability to plan, sense the passage of time, self-monitor, and self-evaluate performance. Students using the GDD model report and demonstrate a confidence in their ability to complete tasks efficiently, a greater feeling of autonomy, and a deeper appreciation for planning and monitoring time.

The GDD model offers clinicians a clinical tool with which to teach the process of task execution. As clinicians who, on the service delivery grid of an individualized education plan (IEP), are asked to consult with classroom teachers or to co-teach in the classroom, SLPs can now use this model as a useful tool to help teachers translate their curricular demands into an executive function intervention that will increase students' planning skills and time spent on-task. For teachers with large class sizes and an increased number of students on IEP's whose goals must be met, the GDD model will likely decrease the amount of one-to-one support a child with poor planning typically requires. For example, teachers using the GDD model report that students more readily initiate, ask fewer questions about what they are being asked to do, complete tasks with greater independence, and quantitatively spend more time on-task.

For clinicians with large caseloads, who typically have limited time with students (often only one hour or less per week, per student), the GDD model helps them to prioritize their interventions. They can now address specific communication goals, while at the same time teach an executive control process that increases a student's ability to attend, follow directions, understand what is being presented, sense the passage of time, and self-monitor.

Summary

For SLPs to teach EF skills in the clinical, school, and home settings, it is critical to understand EF as a self-regulatory process that requires students to demonstrate situational awareness, and then activate nonverbal (visual forethought) and verbal working memory (self-directed talk) in order to achieve a predicted outcome. Preliminary observations, descriptions, and findings suggest that our GDD model is a promising clinical intervention that can be implemented to foster independent task completion within allotted time frames. This model scaffolds for students a method of self-regulation that helps them develop an appreciation for the *complexity* of tasks, while at the same time giving them an understanding of the *simplicity* of task execution when visualizing an outcome and then breaking that forethought into manageable parts.

Based on teacher and clinician feedback in school, therapy, and home settings where this model has been implemented, students have demonstrated a notable increase in self-esteem and autonomy using the GDD model. Programs and methods to develop EF skills are critical, not only when technology is swiftly changing the way students think and behave, but also at a time when the American educational system is increasingly stressing standards-based test performance. Opportunities have plummeted for imaginary play, trial by error learning, and allocated time to do tasks that allow for the students to "plan-execute-review-try again." Paul Pintrich, an educational leader and legacy of research on self-regulated learning, defined self-regulation as "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation and behavior, guided and constrained by their goals and the contextual features in the environment" (Pintrich, 2000). As research has shown that a student's academic skills and abilities do not always account for achievement, integrating explicit instruction in self-regulation and motivation into the core curriculum may mean the difference between mere performance and actual learning. If EF truly is self-regulation, then using the GDD model in the clinic, school, and home settings shows great promise of clinical utility in developing the core EF skills for lifelong achievement in planning, time management, organization, motivation, and metacognition.

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Situational Awareness and Executive Function Skills

How Does a Student go From Intention to Action?

Dismissed from class, John a 7th grader, leisurely walks towards his locker. At the same time, the peers around him are moving quickly towards their own lockers. He tries to catch the attention of his

peers, but many just give a quick dismissive smile and hurry to gather their belongings before the bell rings. Once at his locker, John starts to talk eagerly to the boy next to him, but he does not initiate gathering his class materials. The boy is quickly exchanging one set of binders for another and gives John a few head nods that are clearly sending nonverbal signals that he does not want to talk right now because he is focused on arriving to class on time. Regardless, John keeps talking and then the bell rings. He seems almost startled by the bell and shoves one book in his locker before absentmindedly grabbing another book and spiral notebook. With an unhurried pace, he heads to his next class and is the last to arrive. Other students have out on their desks a textbook, pencil and composition notebook. John walks to the back of the class, flips through the newest science magazine on the teacher's desk, then sits down and drops his books on the floor. Upon being prompted by the teacher to take out his book, he suddenly realizes he does not have the right book with him.

He leaves class to get the correct book. Upon his return, the class has already begun to do a science experiment. Students are preparing slides and looking through microscopes. John sits at the science lab table and when cued hops up to retrieve a slide. He takes the long way around the classroom, finally grabs the slide and returns to his stool. The teacher reminds him he needs to get a water dropper and a coverslip. En route to get the materials he stops and socializes with a peer for a quick moment and then returns with the coverslip but not the dropper. By the time John has gathered all the supplies and prepared his slide, the other students in the class have already begun to sketch their observations into their lab notebooks.

Class ends at 9:50. At 9:45, students are told they need to get ready to leave class. John stays focused looking through the microscope and does not notice his classmates getting up and moving about in the class. Peers start writing down their homework, putting away the microscopes in a cabinet and begin packing up their personal belongings. John did not appear to notice these subtle changes in the pace and movement of the class, and instead, stays focused on his lab notebook. The teacher then announces to the class, "2 minute





warning to finish drawing your observations and store your materials. Then, take out your agenda book." John still does not respond. At this point, all the other students are packed up and ready to go and have agenda books out for the teacher to check off their homework as being recorded. The teacher cues John, "Pack up please." John still does not respond. The teacher approaches his lab table and says, "John you are running out of time." He replies, "UhHuh." However, he does not change his behavior and remains focused on the lab. All of the students have left the classroom. When John finally stops working, he leaves his microscope and lab notebook on the table and walks out of the classroom.

While his overall grades are okay John struggles on almost a daily basis to be on time to class, to have the required materials, to initiate and complete in class work. This prompted a referral for an evaluation. Scores on standardized measures of intelligence were high to above average and John did not qualify for special education services. These high standardized scores demonstrated that when he was in a highly structured test setting with a limited number of factors to attend to, he could hold information in his working memory, process information, and execute effectively. However, when the situational factors, such as peers, environmental cues, materials, and directions, to attend to increased even slightly so he had to integrate and organize these factors as a means to regulate his behavior, his executive control processes dramatically declined. As if often the case, executive function challenges are often not a correlate of IQ.

More often executive function challenges are associated with SQ. SQ? You might have heard of EQ- Emotional Intelligence. But SQ? SQ is Situational Intelligence. There is a wealth of research on Situational Awareness (SA) as it pertains to military operatives, emergency response providers, and medical professionals in high attention demand situations. Yet, there is little research related to SA, task execution, and academic performance. A pioneer in in the field of military situational intelligence, John Boyd, developed the OODA loop to identify the core features of situational awareness: Observe, Orient, Decide, Act. The OODA loop is a process that defines how we react to the stimuli we are bombarded with all day. In the first stage, we Observe or sense the key features in a situation to understand what is happening around us. These are not limited to visual stimuli, but also include kinesthetic (spatial/perceptual/temporal) and emotional information. In the Orient stage, an individual now focuses his or her attention to interpret what he or she has observed or sensed. The next step is to Decide and to determine a course of action based on what has been observed and focused upon. The last step is to Act upon that decision. The "loop" is considered to be what happens between the onset of the stimulus and one's reaction to that stimulus to regulate their behavior towards a future goal.

SA informally as "knowing what's going on" and, more formally, as "the perception of the elements in the environment within a volume of time and space, the comprehension of their

meaning and the projection of their status in the near future." Situational awareness involves both a spatial and temporal component. Time is a critical concept, as SA is dynamic and changes at a speed imposed by the characteristics of the task, the actions of people, and the features of the surrounding environment.

Situational Intelligence includes four specific elements:





1. **Extracts**: the student observes the key information about space, time, objects, and people in the environment to orient themselves and "gets a sense" of what is happening in the specific moment in time to extract the most relevant information while ignoring nonrelevant information. They use this salient information to successfully integrate information with their internal knowledge to create a mental picture of the current situation.

2. **Determines Purpose**: the student uses this mental picture to decide or determine his or her role (status) or purpose within that given volume of time and space of the situation.

3. Predicts: The student comprehends the meaning of the above to anticipate his or her expected behaviors in the near future and to predict the most efficient way to navigate space, sequence actions for goal attainment, gather necessary materials, and coordinate his or her actions with and in consideration of others.

4. Shifts flexibly: In the OODA loop, once the person has observed and oriented to the environment, he or she decides a course of action and then acts. In the classroom "act" presents as the ability to stay on-task and to inhibit those behaviors which impede task completion. In other words to "not act" or exhibit impulse control. Given the ever changing demands of the classroom environment, the student must remain flexible to shift and change their actions to match the dynamic nature of the situation.

To help a student go from Intention to Action and **Do** the task it is imperative to strengthen their Situational Intelligence: to STOP, observe and read a room, orient to the expectation in a moment in time, decide what is required and then act within the allotted time frame.
Executive Function Situational Awareness Observation Tool

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Abstract

John, an 8th grader, is dismissed from class and leisurely walks towards his locker while, at the same time, the peers around him are moving quickly towards their own lockers. He tries to catch the attention of his peers, but many just give a quick dismissive smile and hurry to gather their belongings before the bell rings. Once at his locker, John starts to talk eagerly to the boy next to him, but he does not initiate gathering his class materials. The boy is quickly exchanging one set of binders for another and gives John a few head nods that are clearly sending nonverbal signals that he does not want to talk right now because he is focused on arriving to class on time. Regardless, John keeps talking and then the bell rings. He seems almost startled by the bell and shoves one book in his locker before absentmindedly grabbing another book and spiral notebook. With an unhurried pace, he heads to his next class and is the last to arrive. All of the other students have out on their desks a textbook, pencil and composition notebook. John walks to the back of the class, flips through the newest science magazine on the teacher's desk, then sits down and drops his books to the floor. Upon being prompted by the teacher to take out his book, he suddenly realizes he does not have the right book with him.

Class ends at 9:50. At 9:45, students are told they need to get ready to leave class. Sam stays focused on his worksheet and does not notice his classmates getting up and moving about in the class. Peers start putting away laptops and books in the computer cabinet and class locker and begin packing up their personal belongings. Sam did not appear to notice these subtle changes in the pace and movement of the class, and instead, stays focused on his worksheet. The teacher then announces to the class, "2 minute warning to save, finish up and store your materials. Then, take out your grade sheets." Sam still does not respond. At this point, all the other students are packed up and ready to go and have blue cardstock grade sheets out for the teacher to write on. The teacher cues Sam, "Sam. Pack up please." Sam still does not respond. The teacher approaches his desk and says, "Sam you are running out of time." Sam replies, "UhHuh." However, he does not change his behavior but remains focused on the worksheet, although he is not actually writing on it. All of the students have left the classroom when Sam finally stops working, leaves his worksheet on the desk and walks out of the classroom.

John and Sam, while clearly struggling to meet situational expectations in the classroom, pose a challenge for the speech-language pathologist (SLP) to support as their scores on standardized measures of intelligence and language are high to above average and they both do not qualify for special education services. These high standardized scores demonstrated that when they were in a highly structured test setting with a very limited number of factors to attend to, they could hold information in their working memory, process information, and execute effectively. However, when the situational factors, such as peers, environmental cues, materials, and directions, to attend to increased *even slightly* so they had to integrate and organize these factors as a means to regulate their behavior, their executive control processes dramatically declined.

Parents, teachers, and SLPs alike are frustrated. Parents want services to support their struggling child, teachers feel these students are prompt-dependent and require a significant amount of the teacher's attention, and the SLP often expresses that he or she has tried compensatory strategies, but that they do not generalize to support the student in becoming more independent. This feedback, combined with our own multitude of student observations, led us to consider how we could more carefully distinguish a student's pattern of situational awareness strengths and limitations and, in turn, use this data to create effective and individualized treatment interventions as well as monitor progress toward the development of the core executive control skills.

Executive Function

There has been a steady and rapid rise in the number of students diagnosed with executive dysfunction (Barkley, 2012). While executive-function-based challenges are frequently concomitant symptoms of autism spectrum disorders, traumatic brain injury, attention deficit, and a variety of other neurologic diagnoses such as Tourette's, generalized anxiety disorder, and oppositional defiant disorder, there has been a rapid increase in the identification of executive-function-based challenges in the absence of other diagnoses. The diagnosis of executive function is laden with complexity, as it is not a single skill but rather the collection of multiple cognitive skills that function in a coordinated way to enable an individual to "engage in purposeful, organized, strategic, self-regulated, goal-directed behavior" (McCloskey, 2012, p. 15). Self-regulation is essential for task execution and involves three key components: (a) any action that allows students to stop and direct themselves, (b) how this action results in a change in their behavior, and (c) how this behavior changes the likelihood of future consequences or the attainment of a goal (Barkley, 2012). This ability to stop and direct oneself is deeply tied to a student having strong situational awareness (SA) skills.

There is a wealth of research on SA as it pertains to military operatives, emergency response providers, and medical professionals in high attention demand situations, such as the field of anesthesiology. Yet, there is little research related to SA, task execution, and academic performance. A pioneer in in the field of military situational intelligence, John Boyd, developed the OODA loop to identify the core features of situational awareness: Observe, Orient, Decide, Act. The OODA loop is a process that defines how we react to the stimuli we are bombarded with all day. In the first stage, we *Observe* or sense the key features in a situation to understand what is happening around us. These are not limited to visual stimuli, but also include kinesthetic (spatial/perceptual/temporal) and emotional information. In the *Orient* stage, an individual now focuses his or her attention to interpret what he or she has observed or sensed. The next step is to *Decide* and to determine a course of action based on what has been observed and focused upon. The last step is to *Act* upon that decision. The "loop" is considered to be what happens between the onset of the stimulus and one's reaction to that stimulus to regulate their behavior towards a future goal.

The work of Mica Endsely, "Measurement of Situation Awareness in Dynamic Systems", (Endsley, 1995) has served to be the other seminal work to Boyd in defining SA. Endsley defines SA informally as "knowing what's going on" and, more formally, as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Wickens, 2008, p. 2). Situational awareness involves both a spatial and temporal component. Time is a critical concept, as SA is dynamic and changes at a speed imposed by the characteristics of the task, the actions of individuals, and the features of the surrounding environment. As new information is processed, individuals with strong SA incorporate the ideas into their mental schema and make any necessary changes in their plans and actions to achieve the expected or desired goal of the current context in which they are exhibiting task execution skills. Situational awareness also involves spatial knowledge about the activities and events occurring in a specific location(s). (Endsley & Jones, 2001) Barkley emphasizes the importance of spatial capacity to self-regulation as individuals will purposefully

arrange themselves within their surroundings or organize their physical environment to attain goals (Barkley, 2012).

In more recent years, SA teamwork has emerged as a concept by which we assess the extent to which an individual knows and understands what other individuals on their team or who they are working with in their shared environment are thinking about and what goal they are working towards. To what extent do individuals in a situation share the same mental model to interpret each other's actions and or to make accurate projections regarding other's actions? This concept of possessing shared mental models to facilitate coordination of actions and communication in shared settings significantly aligns with the Social thinking[™] concepts developed by Michelle Garcia Winner (Winner, 2007). In team SA research, there is a direct focus on the devices available for sharing situational information amongst individuals to inform about the situation. These can include direct communication (verbal and nonverbal), a shared environment, or shared displays (e.g., visual, audio, or tactile displays). Thus, in addition to the spatial, temporal, and objective components of SA, we now add a social component.

Given the general definition of SA is "the ability to perceive the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Wickens, 2008, p. 2). Dominguez et al. (1994) extended this definition and identified that SA needed to include four specific elements:

- 1. **Extracting** information from the environment;
- 2. **Integrating** this information with relevant internal knowledge to create a mental picture of the current situation;
- 3. Using this picture to **direct further perceptual exploration** in a continual perceptual cycle; and
- 4. **Anticipating** future events.

Taking these four elements into account, SA is now defined as the "continuous extraction of environmental information, the integration of this information with previous knowledge to form a coherent mental picture, and the use of that picture in directing further perception and anticipating future events" (Dominguez, 1994, p. 19).

A review of the research revealed an absence of literature on SA as it pertains to students and their executive function and self-regulatory performance in the classroom. Therefore, we translated these formative definitions of SA into the four core elements of SA a student must exhibit for successful self-regulation and executive control.

- 1. **Extracts**: the student *observes* the key information about space, time, objects, and people in the environment to *orient* themselves and "gets a sense" of what is happening in the specific moment in time in order to extract the most relevant information while ignoring nonrelevant information. They use this salient information to successfully *integrate* information with their internal knowledge base to create a mental picture of the current situation.
- 2. **Determines Purpose**: the student uses this mental picture to decide or determine his or her role (status) or purpose within that given volume of time and space of the situation. Considering the increase in research in teamwork, SA, and the importance of social thinking and communication to the field of speech and language pathology, the student also determines or recognizes the role and communication of others within the situation.

- 3. **Predicts**: The student comprehends the meaning of the above to anticipate his or her expected behaviors in the near future and to predict the most efficient way to navigate space, sequence actions for goal attainment, gather necessary materials, and coordinate his or her actions with and in consideration of others.
- 4. **Shifts flexibly**: In the OODA loop, once the individual has observed and oriented to the environment, he or she decides a course of action and then acts. In the classroom "act" presents as the ability to stay on-task and to inhibit those behaviors which impede task completion. In other words to "not act" or exhibit impulse control. Given the ever changing demands of the classroom environment, the student must remain flexible to shift and change their actions to match the dynamic nature of the situation. As such, this tool effectively captures the dynamic nature of executive function skills in everyday settings.

The Situational Awareness Observation Tool

Our SA Observation Rubric was designed to be aligned with Endsley's Level I model of SA (Wickens, 2008) to easily assess in a specific context a student's ability to perceive the relevant and multiple situational elements in the environment which lead to awareness (objects, events, people, systems, environmental factors) and their current states (locations, conditions, actions). To simplify, we utilized the acronym STOP to capture a student's ability to observe, orient, decide, and act upon the features of *Space, Time, Objects* and *People* in their environment.

Rationale

The importance of:

developing nonstandardized, functional, and context-sensitive assessment is supported by extensive research demonstrating the shortcomings of standardized, office-bound language and neuropsychological testing for individuals with prefrontal dysfunction. (Coelho, Ylvisaker, & Turkstra, 2005, p. 4)

In the area of executive function, considerable conceptual and empirical research has been conducted to interpret standardized measures that impact the executive system as a whole. These are static measures, and yet the ability to execute tasks occurs at a dynamic level in an ever-changing environment (Burgess, 1998). Identified limitations and criticisms of using standardized measures to predict executive functions include (1) standardized scores are frequently not related to the activities and behaviors required in the classroom environment and (2) standard measures typically only reflect a specific skill or behavior that has been assessed at a single point in time and may have been influenced by noncognitive factors such as fatigue or emotions. (Fuchs, 1986; Haywood, 1992; Tzuriel & Samuels, 2000). In a review of the research on the correlation between standardized measures and situational observation of the executive function skills of students in the classroom and home environment, researchers concluded, "the magnitude of these relationships was typically weak" (Coelho et al., 2005, p. 4). The downfalls of test conditions that limited a test's ecological and predictive validity have been well documented. (Coelho et al., 2005; Ylvisaker, 1992; See Appendix A). Coelho et al. concluded from this extensive review of the literature the weak correlation between standardized measures of prefrontal executive control skills and everyday performance that it is

critical that educational and vocational assessments include procedures designed to identify carefully and systematically strengths and weaknesses of the individual's performance in relation to a variety of contextual variables, including settings, people, times of day, activities, materials, instructions, and supports. (Coelho et al., 2005, p. 11) Within the domain of a *dynamic executive function assessment tool*, however, the research being conducted towards instrument development is still emerging. A number of rating scales have been developed to offer a window into the everyday behavior associated with the specific domains of the executive functions and they serve as a screening tool for executive dysfunction. Widely used, the Behavior Rating Inventory of Executive Function[®] (BRIEF[®]), a questionnaire completed by parents and teachers of school-aged children, is designed to provide a better understanding of a child's behavioral regulation and meta-cognitive skills by measuring eight aspects of executive functioning: (a) to select appropriate goals for a particular task, (b) to plan and organize an approach to problem solving, (c) to initiate a plan, (d) to inhibit distractions, (e) to hold a goal and plan in mind, (f) to flexibly try a new approach when necessary, and (g) to check to see that the goal is achieved. Other multi-rater scales that offer a standardized score include the Brown ADD Rating Scales for Children, Adolescents and Adults, the Comprehensive Executive Function Inventory[™] (CEFI[®]) and the Barkley Deficits in Executive Functioning Scale - Children and Adolescents (BDEFS-CA).

Many of these rating scales do predict impairments in daily life activities and can be a valid description of the capacities involved in self-regulation, organization and problem-solving, and time management. There are some acknowledged drawbacks. One challenge is that the scales represent the rater reflecting collectively about many observations of the student against the child's ability to execute in a space/situation in a specific moment in time. Some researchers have found that "BRIEF index scores showed no significant correlation with performance-based EF" (Mahone, 2002, p. 1). As outlined by Wortham, rating scales have been identified as being highly subjective and are prone to rater error and bias. Different interpretations of ambiguous terms (e.g., what does "sometimes" always mean?) may lead to raters being less reliable when considering their collective experiences with the student. Furthermore, raters may not be objective, but may rate the child on the basis of previous interactions or on an emotional basis (Wortham, 2008).

Development of the STOP Observation Tool

Thus, we identified the need for an observational tool that measures student performance in a specific situation, which would lead to a better understanding of, and capture the degree to which, the elements of the physical/spatial, temporal, objects, and social environmental factors act as barriers or facilitators to successful task execution for a student. The tool identifies the core skills of SA that are directly observable. It can be used to record information from one observation from a specific situation. To gain a pattern of strengths and weaknesses, the clinician can also make multiple copies of the checklist and record behaviors from a number of contexts in order to collect specific data and to answer questions about the student's executive function skills across the day and in a variety of situations. The qualitative nature of the tool can also be used to identify areas of need for treatment and to assess student progress.

There are many advantages of the STOP observation tool (Appendix B). It is flexible, as it can be used with a variety of assessment strategies and can be used to observe students at many grade and ability levels. It requires minimal formal training by an SLP, teacher, and/or educational support staff to communicate findings with parents and students. The student's progress in developing the underlying SA skills for successful task execution can be tracked. Scoring errors are minimized as behaviors are clearly described and there are no ambiguous terms to interpret. Behaviors can be recorded frequently and in a variety of familiar and novel contexts to gain a clear and broad picture of the student ability and the internal and external factors that influence SA. The items are comprehensive, but the number of items to rate were limited to prevent the rater from feeling overwhelmed with assessment and record keeping. To use, the clinician identifies the context of the situation, observes the student, and then rates presence or absence of the core features of SA. As the situation itself can influence a student's SA skills, we therefore created a subjective rating questionnaire from the Situational Awareness Rating

Technique (SART; Taylor 1990) specific to the classroom setting. This questionnaire takes into consideration the complexity, variability, novelty, and relative stability of the situation.

Clinical Illustration

The following example of a student we observed demonstrates a profile of executive function challenges that commonly leads to a referral for an observation assessment. The executive functioning skills of this student would be best described using the SA tool. The features of SA appear in brackets.

Matt

Class started at 8:10, but at 8:15, Matt arrives [Time]. He drops his backpack by his desk and hands his teacher a late pass. Instead of walking towards the floor where all the other students are seated for morning meeting [Space], he walks towards the art table in the class room [Space]. Once redirected, he walks to the rug where the morning meeting is occurring, but can't figure out where to sit [Predict Space]. Some students move to make him room, but he does not seem to notice **[People]**. Instead, he walks across the rug in front of the teacher and weaves his way in out and out his classmates, occasionally stepping on someone's finger or coat [Space]. Many students say, "Matt!" in disgust, but he does not respond [**People**]. He then stands near the back of the room and looks inside boxes that are holding spiral notebooks. He remains standing and watches the group **[Time - sequence of actions]**. He has a runny nose and is loudly sniffing. He watches the class and keeps sniffing and trying to clear his nose. Again, peers send many nonverbal signals that they are disgusted [People]. The teacher asks students to move over to make room and Matt is cued to sit. As he sits, the 2 boys next to him appear agitated by his presence, and although Matt is now sitting, he is not oriented to what they are talking about [Purpose in moment in Time and People]. Instead, he lifts a band aid off his knee and shows a boy his scab. A minute later, Matt stands and walks back over the students seated in morning meeting with the intent to find a tissue [Time and Space]. He wanders aimlessly about the class occasionally stopping to pick up and look at an object [Space, Time, Objects]. When asked what he is looking for, he says, "A tissue," and he needs to be directed to its location in the room [Space and Objects].

In considering this is a highly familiar situation that has low complexity, low variability, and high stability, Matt's overall inability to "read a room" and extract the purpose of the space is poor. He shows a primary challenge in the area of space awareness. In the absence of his ability to "read the room" and determine the purpose of what is happening in a given moment in time, he in turn exhibits secondary challenges in his capacity to use the nonverbal communication of his peers to regulate his behavior. Because Matt demonstrates primary difficulties with extracting the features of space, the SLP can now identify the key objective to address in therapy.

Goal 1. When in a small intervention group situation and provided a range of situations to critique, Matt will label the features of space, time, objects, and people in 8 out of 10 trials during the intervention session at the independent level of instruction.

Goal 2. Matt will then use these features beyond the intervention room to "read the room/ situation" in structured classroom settings 60% of the time from his current percentage at 5% for reading the room with carryover rehearsed in the intervention group.

1. Objective 1: When in a small intervention situation and given a declarative statement about a feature of space, time, objects or people, Matt will state an "if...then...therefore" statement to anticipate his actions 60 % of the intervention session. Example, when Matt is told it is "8:45" (a time feature) he can use SA to state, "**If** it is 8:45, **then** my class has morning meeting, **therefore** I need to think about how the class sits in a circle and I need to find my space to sit."

2. Objective 2: Take this skill beyond the intervention setting: Matt is expected to stop and read the room and create an "if...then" statement when asked by teachers or parents ____% of the time.

As perceiving time was a secondary challenge for Matt, he is at risk for struggling with awareness of time in other contexts as well, therefore, example of a time awareness goal and objectives might include:

Goal. Matt will acquire a sense of time and estimate the features of time associated with a task: How long will it take? What can I reasonably accomplish in that amount of time? How long did it take last time? What is coming up? How much time do I need to build in for material management? These skills will improve as documented by the increase in accuracy of time management from current level of being timely less than 10% of the time to goal of 60%.

- 1. Objective 1: Matt will draw on a clock and show a "pie" of time demonstrating comprehension of the sweep and volume of time and estimating how long tasks are likely to take.
- 2. Objective 2: Matt will create time markers on an analog clock as a time guideline for determining interim goals for larger tasks (i.e. the student marks the start time, the stop time and midpoint check in to track how time matches progress towards the goal).
- 3. Objective 3: Matt will set time limits for specific activities and use time-related prompts to maintain awareness of the passage of time.

Conclusion: Clinical Utility

Students with executive-function-based challenges often demonstrate limitations in everyday classroom activities, despite average to above average performance on standardized tests of cognition and language. A functional, context-sensitive, and nonstandardized measure is critical to identify real time classroom performance. While evidence-based practices are favored, the diagnosis of executive dysfunction, and, in turn, the development of executive-function-based interventions by school speech-language pathologists, are just in their infancy. The evidence is spare and surprisingly little research exists on the role of SA in the classroom for effective task execution eventhough extracting and acting on the features of SA are crucial to self-regulation.

Because the SLP is trained in teaching the developing spatial, temporal, sequential, and social concepts, the SLP is the ideal professional to be evaluating a student's awareness and use of these features to demonstrate regulated and goal-directed behavior. Recognizing that "one size does not fit all" when it comes to executive function based treatment, the STOP observation tool enables the clinician to be maximally informed in regards to which features of SA to address in clinical interventions and to see measurable progress in the development of the executive control skills. As research emerges about SA and the executive function skills, the STOP observation tool will continue to change to meet the criterion of being "evidence-based practice". It has yet to be formally researched. The tool is designed to complement, and not be a substitute for, the standardized information provided by rating scales. However, the feedback from school-based SLPs and teachers confirms it is a functional utility and many report how accurately it delineates the observed challenges that students are experiencing in dynamic settings that standardized measures failed to capture.

Successful task execution requires the complex orchestration of a multitude of cognitive linguistic skills. It is at the core of what makes us human and even a subtle delay or impairment in executive control can have an enormous impact on everyday function and classroom performance. The STOP observation tool is a first step in teasing out the complex features of SA that contribute

to executive control in dynamic settings and in helping the school based SLP develop a treatment plan that can support student's in navigating daily learning settings more independently.

Resources

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Appendix A: The Downfalls of Testing Conditions

Our Tests often Compensate for Executive Function Deficits¹

The test environment may be neat, quiet and isolated: the variables are controlled

Compensates for: attention or concentration problems, self-regulation and frustration tolerance

A series of short test sessions

Compensates for: reduced endurance and persistence, capacity to push through fatigue, to endure the 'boring' or 'difficult' moments from tasks which take time to achieve

Clear and Scripted Test Instructions

Compensates for: poor task orientation, mental flexibility and/or lack of initiation in spontaneous problem solving. Very little to NO novel thinking is required of the student.

Examiner acts as the "Executive" and determines the goals and objectives and the order of what how things will occur

Compensates for: an individual's ability to identify a relevant goal, derive a plan and sequence their actions to achieve a goal within a reasonable time frame

Test items do not include real life amounts of information to be processed or the rate of delivery

Compensates for: weak integration and generally reduced efficiency of information processing. Tests fail to elicit the difficulties an individual may have generalizing newly acquired skills to novel contexts

Independent test sessions

Compensates for: weak and long term storage and retrieval of new information "from day-to-day"

A supportive and encouraging examiner

May compensate for: an inability to cope with interpersonal stress or perception of demands

¹Assessment and Treatment of Traumatic Brain Injury with School-age Children and Adults by Mark Ylvisaker

Appendix B: Executive Function Situational Awareness Observation Tool

Space	Space Time Objects		People	
 Extracts : Reads The Room Knows what's going on Purpose: Understands the function of the Space for the situation Predicts: Navigates the space efficiently Flexibility: Can shift and transition between spaces 	 Extracts: Knows the Time Demonstrates expected activity in specific time Purpose: Aware of kind of time and time available Predicts: uses If-then reasoning to envision future moment in time, has sequence of actions and time markers, and anticipates what is coming up Flexibility: Can shift Pace Reduced Initiation On pace Reduced Pace 	 Extracts: Gathers all the expected materials/objects for given situation Purpose: Objects are organized within the personal space based on purpose of the task and functional use of the objects Predicts: Can recognize how same but different objects can be Flexibility: Sees the Necessities and relevancy of objects needed to meet a future goal and can inhibit use of objects that are not related to goal. 	 Extracts: Recognizes Role for the given situation Own Other's roles Purpose: Recognizes and expresses the key purpose of communication exchanges Predicts: Makes inferences about communication and anticipates changes in situation based on communication from others Flexibility: Regulates actions based on awareness of others To Verbal Prompts To Nonverbal Prompts 	

Executive Function Situational Awareness Observation Tool

	Low				High
	1	2	3	4	5
Stability of the situation: How changeable is the situations?		•			
Low stable and straightforward High: likely to change suddenly					
Complexity of Situation: How complicated?					
Low: simple and straightforward High: Complex with many interrelated components	•		•		•
Variability of Situation: How many variables are changing within the situation?					
Low: few variables changing High: large number of variables	·		·		
Arousal: How alert is the student?					
Low: low degree of alertness High: alert and ready for the activity	·	-	•		•
Concentration of Attention: How much is the student concentrating on topic at hand in the situation?					
Low: Absent to limited focus on only one aspect High concentrating on many aspects of the situation			•	-	•
Degree of Distractability: How distracted is the student in the situation?					
Low: focused on only one aspect High: A high degree of shifting attention from stimuli to stimuli	·	·	·	•	·
Spare mental capacity: How much mental capacity does the student have to spare in the situation?					
Low: nothing to spare at all High: sufficient to attend to many variables					
Information Quantity: How much information has the student gained about the situation?					
Low: very little High: received and understood a great deal of knowledge	·	•	•	•	•
Familiarity with the Situation: How familiar is the student with the situation?					
Low: a New situation High: A great deal of relevant experience	1				

Situation Awareness Rating technique (SART) (Adapted from Taylor 1990)