CAN’T vs. WON’T: Executive Functioning and It’s Effect on Behavior: Assessment and Treatment Theory and Practice
David Gotthelf, Ph.D., NCSP

Defining Executive Functioning
- There is no universal definition of Executive Functioning.
- These aspects of behavior are not easy or straightforward to observe, measure, or define.
- Disability Categories you may see used:
  - Neurological
  - Learning Disability
  - Emotional
  - Health (ADHD)

Why look at Executive Functioning?
- Children we see with various disorders also exhibit executive dysfunction, which may help define and explain problematic behaviors.
- Is there a behavioral component that might suggest an attention or some other disorder?
- Executive Functioning may explain behavior not easily measurable.

Executive Functioning is Critical to Human Development
- “Crowning achievement of human development”
- Separates us from animals
- Allows us to think about ourselves, social relationships, and what future may bring
- Allows for planning and delayed gratification

Executive Functioning: Developmental Aspects
- Executive functioning unfolds as we mature, (Denckla), resulting in:
  - Increasing Independence
  - Maturation of Self-Regulation
  - Development of Self-Generated Productivity
  - Managing Emotional Influences

ASPECTS OF EXECUTIVE FUNCTIONING
Executive Functioning: Memory

- Short term
- Working
- Delayed
- Long term
- Recognition

- Simple
- Complex
- Semantic
- Contextual
- Conceptual

Executive Functioning: Attention

- Effortful Control
- Auditory response control
- Visual response control
- Sustained auditory attention
- Sustained visual attention
- Impulse control

Executive Functioning: Behavior Regulation

There is a strong connection between the frontal cortex and the amygdala.

- Ability to inhibit behaviors
- Ability to shift easily from one task to another
- Emotional control
  - Anxiety management
Executive Functioning: Metacognition

- Ability to initiate tasks independently
- Working memory
- Planning and organization of assignments
- Organization of Materials
- Self-monitoring of progress on a task

What conditions may be at risk for Executive Dysfunction?

- ADD/ADHD
- Anxiety Disorders
- Autism Spectrum Disorders (ASD)
- Traumatic Brain Injury
- Central Auditory Processing Disorder
- Language Processing Disorder
- Specific Learning Disability

And what situations often result in Executive Dysfunction?

- Computer and Computer/Phone Usage
- Gaming
- Poor Sleep Hygiene
- Substance use: marijuana
- Multitasking

Let’s look at each of these:

Computer and Computer/Phone Usage

- We need to address this as a major problem in its own right.
- The challenge is the novelty of computer games and social media overwhelms tasks and activities that require sustained attention to fewer stimuli and stimuli that do not change frequently, e.g. Reading vs. YouTube
- The screen itself
  - The blue underlying color of screens
  - All color as a stimulating factor.

Computer Addiction as Defined by the World Health Organization

- The WHO (World Health Organization) has put “Gaming Disorder” in its latest diagnostic manual
- It’s important to note that the existence of a gaming disorder does not mean doctors are saying games are inherently bad or dangerous.
- Video games can be an effective learning tool, and they can also just be fun.

Gaming Disorder (ICD-11 June 2018) Defined Behaviors:

- Impaired control over the onset, frequency, intensity, duration, termination, or context of gaming
- Increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities
- The continuation or escalation of gaming despite the occurrence of negative consequences
Sleep Hygiene

- Sleep hygiene is a major problem for young adults, teens and younger students.
- Lack of sleep significantly affects executive functioning and learning.
- Causes:
  - Computer usage and Texting: Going to bed with one's phone is a major problem.
  - Longer and more demanding schedules of students: academic day, sports, and other activities are affecting sleep.

Marijuana Use

- Now that marijuana is legal for recreational use, we must give this additional concern.
- Research indicates that marijuana has a significant negative effect on working memory/executive functioning, particularly in growing brains.
- This means anyone under 25 should NOT use marijuana.

Multitasking: Is it possible?

- Most neuroscience research notes the brain doesn’t really do tasks simultaneously but rather switches quickly between tasks.
- There is some validity to multitasking regarding doing an automatic and an explicit task, e.g. walking and talking.
- But doing two school related tasks, e.g. using the computer and listening to the teacher at the same time is for all practical purposes impossible.

Assessing Executive Functioning

How should we assess Executive Functioning?

- Classroom Observations
- Parent and Teacher Questionnaires
- Behavior Rating Scales
- Standardized Diagnostic Testing

Let’s look at each of these:

Classroom Observation

- Only required for determining SLD eligibility but...
- It can be an important component for assessing Executive Functioning.
- Even if you don’t have to do the classroom observation, you should do it anyway.
Questionnaires

- Teachers are required to complete a student questionnaire as part of a special education evaluation. The state has a form to use, but it can be revised and made more comprehensive.
- Parent questionnaires can be very helpful, but they are not legally mandatory.

Examples of Items from Teacher and Parent Questionnaires:

- Resists or has trouble accepting a different way to solve a problem with schoolwork, friends, chores, etc.
- Becomes upset with new situations.
- Acts upset by a change in plans.
- Is disturbed by a change of teacher or class.
- Resists change of routine, food, places, etc.

More Examples of Items from Teacher and Parent Questionnaires:

- Does not think before doing.
- Interrupts others.
- Is impulsive.
- Gets out of seat at wrong times.
- Gets out of control more than friends.
- Acts too wild or “out of control.”
- Has trouble stopping or attenuating his/her actions.

More Examples of Items from Teacher and Parent Questionnaires:

- Does not bring home homework assignments sheets, materials, etc.
- Has good ideas but cannot get them on paper.
- Forgets to hand in homework, even when completed.
- Gets caught up in details and misses the big picture.

EF Rating Scales: The BRIEF2

- Rates executive functions at home and in school.
- Specific versions for parents, teachers, and students.
- Very helpful in breaking down EF into clear and understandable groupings.
- Be aware: The BRIEF2 doesn’t cover all possible factors that may result in behaviors resembling EF.

BRIEF2 Indexes and Scales

- **Behavior Regulation**
  - Inhibit
  - Self-Monitoring of behaviors
- **Emotion Regulation**
  - Ability to shift from one activity to another
  - Emotional Control
- **Cognitive Regulation**
  - Initiate
  - Working Memory
  - Plan/Organize
  - Organization of Materials
  - Task-Monitoring
**Rating Scales Specific to ADHD**

- Connors ADHD Scale
- Brown ADD Scale
- ADHD IV Scale

These scales focus on behaviors associated with ADHD, although the first two also cover behaviors associated with executive functioning.

**BASC-3: Another scale you might use.**

- Addresses a greater number of clinical behaviors, including attention and hyperactivity.
- Covers a broader range of behavioral functioning than the BRIEF and other scales.
- Not as comprehensive as the BRIEF in covering executive functioning, but:
  - The BASC-3 may uncover emotional factors influencing executive functioning.

**Questions to consider:**

- Classroom observation? Who will do it?
- Which scales should be given to parents, to teachers, and to para-professionals; And how many scales should be given?
- Will school staff and parents complete rating questionnaires and rating scales in a timely manner?

**Standardized Testing: Do we need it?**

- If questionnaires and rating scales are completed, is there a need for diagnostic standardized testing? "No" vs. "Yes":
  - **No**: Testing is redundant and may not always identify reasons for behaviors.
  - **Yes**: Rating scales are subjective, while standardized tests give a more accurate diagnostic profile, and schools may want it for legal coverage.

**Testing Considerations**

- Standardized tests are done in a structured situation, arguably not a high demand environment for executive functions, so behavioral problems related to E.F. may not be observed.
- There is no singular disorder of Executive Dysfunction, so the tests may not specifically determine this.

**Standardized Testing: More issues**

- Neuropsychological Evaluation: Considered necessary by many parents & professionals for the assessment of executive functioning.
- Not all neuropsychological tests are highly correlated to executive functioning. Some tests are better than others. Examples:
  - Rey-Osterrieth Complex Figure (ROCF)
  - Wisconsin Card Sort Test (WCST)
  - D-KEFS: Trails; Verbal Fluency; Color-Word; Twenty Questions; Tower
EXECUTIVE FUNCTIONING WITHIN SPECIFIC CONDITIONS

Attention Deficit Hyperactivity Disorder—Inattentive Type

- May sometimes be overlooked when there is not a high activity level, at least early on.
- Difficulty sustaining attention.
- Working Memory problems resulting in what may appear at first as Comprehension problems.
- Historically has been overlooked in girls, but this has improved.

Color-Word Test: (Effortful Control)

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ADHD: Attention Deficit Hyperactivity Disorder

- Longstanding history of attentional and behavioral control difficulties including hyperactivity, impulsivity, and problems sustaining attention in school.
- Problems may be first noted in kindergarten, becoming more pronounced in second grade, including difficulties with peer relationships.

Severe Executive Dysfunction

- Academic performance declines over time, starting in middle school, and worsening in high school.
- Average to above average intellectual ability, but poor completion of assignments.
- Loses or forgets homework.
- Easily overwhelmed.
Asperger’s Syndrome

- Difficulty with social skills.
- Student may have characteristics of ADHD.
- Anxiety is another concern, e.g. OCD.
- May not always respond to medication.
- Difficulties appear early in life.
- Overly focused on certain subjects.
- May be strong in reading and spelling.

Mood Dysregulation

- Often overreacts to change in routine.
- May have characteristics of ADHD.
- Anxiety is often another concern.
- Overly focused on certain subjects.
- May have strong intellectual and academic skills: The “2E” student.

INTERVENTION AND MANAGEMENT

The Ultimate Goal:

- To establish regular behavioral and cognitive routines to maximize independent, goal-oriented problem solving and performance.

2 Underlying Assumptions:

1. Many students would rather be seen as “bad” rather than “dumb.” This takes the focus off their inability to do the work.
2. The idea underlying being a “coach” is to help students be successful rather than thinking that they are just lazy.

EF: Changing Curriculum Demands

- EF processes underlying most academic work generally begin in the 4th grade.
- At 4th grade on up, there is an increasing need to coordinate multiple sub-processes:
  - Planning time.
  - Organizing and prioritizing information.
  - Distinguishing main from subordinate ideas.
  - Monitoring one’s progress.
  - Ability to reflect one’s schoolwork.
Dimensions of Intervention

- **Personal:**
  - Understand student strengths and weaknesses.
  - Teach strategies in small groups and progress to large groups.

- **Environmental:**
  - Structure situations and assignments, using lists, schedules, visual cues, educational aids.

- **Activity:**
  - Design assignments and activities so that they have a clear organization and structure.

Basic Principles of Intervention

- **Proposed Outcomes:**
  - Demonstrate purposeful, goal-directed activity.
  - Display an active problem-solving approach.
  - Exert self-control.
  - Demonstrate reliable and consistent behavior and thinking.
  - Demonstrate positive self-efficacy.
  - Exhibit an internal locus of control.

Fixed Mindset vs. Growth Mindset

**Two ways of thinking** (Carol Dweck)

- **Fixed Mindset:** Intelligence can't change
  - Challenges: Avoid them.
  - Obstacles: Give up easily.
  - Effort: See effort as fruitless or worse.
  - Criticism: Ignore useful negative feedback.
  - Success of others: Threatened by success of others.
  - The result: We may plateau early and achieve less. It means we can't change.

- **Growth Mindset:** Intelligence is developed
  - Challenges: Embrace change.
  - Obstacles: Persist in the face of obstacles.
  - Effort: See effort as the path to mastery.
  - Criticism: Learn from criticism.
  - Success of others: Find lessons and inspiration.
  - The result: We may reach higher levels of achievement. It means we have much greater free will.

The Power of Habit: Creating Good Habits

**Duhigg’s 4 Step Framework**

- Identify the routine:  Cue → Routine → Reward
- Experiment with rewards (Timing is everything)
- Identify and isolate the cue:
  - 1. Location
  - 2. Time
  - 3. Emotional State
  - 4. Immediately preceding action(s)
- Have a plan to make this automatic: When I see a CUE, I will do a ROUTINE, in order to get a REWARD.

Accommodations vs. Modifications

- **Accommodation:** Change in course, standard, or test (prep, location, timing, scheduling, expectations, responses) that allow participation without lowering performance standards.

- **Modification:** A change that does lower standards or expectations.
IEP/504 EF Interventions

- Rather than specific academic curriculum “content,” these goals focus on the development of a learning and/or problem solving “process” designed to enhance the efficient learning and memory of academic information.
- Emphasis of support is on teaching, modeling, and cueing an approach to self-management through active planning, organization, and monitoring of work.

Long Term Goals for an IEP

- “The student will independently employ a systematic learning/problem solving method (Goal-Plan-Do-Review system) for tasks that involve multiple steps and/or require long-term planning.”
- Domain specific goals and objectives are then articulated.
- For younger children, preface with “With directed assistance,…….will…..

One Behavioral Goal Example: Questions every student should ask each day.

1. What assignments do I need to work on and in what order will I do them?
2. Where will I do those assignments?
3. When will I start work on those assignments?
4. About how much time will I need for each one?

Non-Academic Interventions for Executive Functioning and ADHD:

- Medication
- Stress and anxiety management
- Exercise
- Neurofeedback
- Working memory training
- Should these be used in school? If so, when, how, and who is in charge?

Medications: Who prescribes? Who monitors?

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<td>These medications may be prescribed by a variety of practitioners: pediatrician, nurse practitioner, nurse practitioner trained specifically in the area of psychological medications; psychiatrist.</td>
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<td>A major question is whether any of these practitioners have training and experience in working with children with ADHD and/or executive functioning issues.</td>
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<td>Other questions: What about the side effects? Who monitors this in school?</td>
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Stress Management

- The idea is that if we help students with executive functioning challenges better manage their anxiety and stress, they will function better in school.
- Examples:
  - Mindfulness: Slow breathing, Yoga
  - Apps: Calm; Breathe2Relax; HeadSpace; Smiling Mind
Exercise

- Exercise benefits both executive functioning and learning (Ratey, 2008).
- Even short, moderate, regular exercise can be beneficial.
- Consider: Working memory has a limited capacity that can overload if too much information is given at once.

**Question: Whatever happened to recess?**

Neurofeedback

- The hypothesis: Students with executive dysfunction and/or ADHD are not generating appropriate brainwaves associated with sustained attention and other aspects of EF.
- Newton Public Schools pilot study completed at middle school level found improvement in executive functioning and attention following the use of neurofeedback.

Working Memory Training

- The premise is that improvement of working memory will improve general executive functioning and behaviors related to ADHD.
- Examples:
  - Cogmed
  - Lumosity
  - Cogni Fit
  - **Dual N-Back (the best one):** [http://brainworkshop.sourceforge.net/download.html](http://brainworkshop.sourceforge.net/download.html)
- The problem is that the research is not strong in terms of any of these approaches being effective.

The Latest Behavioral Strategy: Virtual Reality

- Virtual Reality can help kids learn attention skills in a "real" environment.
- The immersive environment of Virtual Reality can promote sustained focus and attention, although some kids can get over immersed and have difficulty leaving it.
- Virtual Reality can create "game" scenarios to promote practice in sustaining attention.
- Research is limited but seems positive.

Thinking of the Future: Executive Functioning & College

- How would the issues presented today be manifested at the college level?
- What sort of services and support could and should be offered to students?
- What should professors know and do about executive functioning?

Conclusions

- We need to take a leadership role in both assessing and addressing issues related to executive functioning.
- We can quantify certain behaviors.
- We can determine how well teachers and parents agree on how the student is viewed and how the student views him/herself.
- We can make concrete suggestions for management.
References and Resources

- Bones, Bobby (2018) *Fail Until You Don’t: Fight, Grind, Repeat*, Dei Street Books