Improving Executive Functions: Strategies to Change the Brain and Change Behavior

Presented by

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“Reliable information on how to minimize cognitive decline with age... I highly recommend.” – JANE BRODY, THE NEW YORK TIMES

Staying Sharp

9 KEYS for a YOUTHFUL BRAIN through MODERN SCIENCE and AGELESS WISDOM

HENRY EMMONS, MD,
Author of The Chemistry of Joy and The Chemistry of Calm,
and DAVID ALTER, PhD
HIGHER CORTICAL FUNCTIONS IN MAN

ALEKSANDR ROMANOVICH LURIA

PREFACES TO THE ENGLISH EDITION BY
HANS-LUKAS TEUBER
AND
KARL H. PRIBRAM

Second Edition, Revised and Expanded

3
Assessment of the Use or Disuse of Executive Functions Hinges on Careful Observation of Behavior.
Behavior Observation and Inferences about Brain Function

What’s the difference between a Similarities Scaled Score of 12 (75th percentile) …

…and a Similarities Scaled Score of 12 (75th percentile)?
Task Performance is directed by Executive Functions or an Executive Functions substitute.

The neural networks used to perform a task depend on perceptions about how the task should be done.
Most of what a teacher, therapist, or work supervisor says to student, client, or worker is intended to activate specific neural networks within that person’s brain.
The more specific the language used by a teacher, therapist or supervisor the more likely it is that the student, client or worker will be activating the brain networks needed for effective performance.
The Wisdom of Kurt Lewin

“There is nothing more practical than a good theory.”

Known for his *field theory of behavior* that posits that human behavior is a function of an individual’s psychological environment.
EF as the Conductor of the Brain’s Orchestra or CEO of the brain (i.e., EF as “g”)

[Diagram showing a central figure with lines extending to various labels, indicating a hierarchical structure.]

EF
What are executive functions?
Key Concept

Executive Functions:

- Directive capacities of the mind
- Multiple in nature, not a single capacity
- Part of neural circuits that are routed through the frontal lobes
- Cue the use of other mental capacities
- Direct and control perceptions, thoughts, actions, and to some degree emotions
Executive Functions Are Not a Unitary Trait

Appropriate Metaphors for Executive Functions:

- The conductor and section leaders of the mind’s Orchestra
- The management structure of a multinational mind corporation
- The coaching staff of team mind
The Management Structure within a Holarchical Model of EF

Trans-Self Integration

Self-Generation

Self-Determination

Self-Realization

Self-Activation

Self-Regulation

Activation
**Domains of Functioning Directed by Executive Functions**

**Action**  
Executive control of modes of output including behavior in the external world and storage and retrieval of internal representations.

**Cognition**  
Executive control of thoughts and thought processing.

**Perception**  
Executive control of modes of perceptual input including external sensory stimuli (visual, auditory, kinesthetic) and internal (representational) stimuli.

**Emotion**  
Executive control of moods, feelings, and the processing of emotions.
The Management Structure within a Holarchical Model of EF

- Trans-Self Integration
- Self-Generation
- Self-Determination
- Self-Realization
- Self-Regulation
- Self-Activation
Management Structure within a Holarchical Model of EF

Trans-Self Integration
Self-Generation
Self-Realization
Self-Determination
Self-Regulation
Self-Activation

Perceive
Focus
Sustain
Energize
Initiate
Inhibit
Stop
Interrupt
Flexible
Shift
Modulate

Plan
Evaluate/Compare
Decide
Sense Time
Pace
Sequence
Execute
Generate
Associate
Organize
Prioritize

Retrieve
Store
Manipulate
Hold

Goal setting
Long-range Planning & Foresight

Self-Awareness
Other-Awareness
Self-Analysis

Monitor
Correct
Balance
Gauge
Anticipate
Estimate Time
Analyze

Activation
Key Concept

It is important to distinguish between Executive Functions and Executive Skills.
Executive Functions involve the part of the executive network that is used to become aware of the need for the use of executive skills and other mental capacities and used to cue and direct the use of the needed executive skills.
Executive Skills are responsible for cueing the specific areas of the brain needed to perform specific tasks (e.g., attending, inhibiting, modulating, planning, organizing, associating).
Executive Functions develop Holarchically across levels rather than Hierarchically.
Holarchy vs Hierarchy

Hierarchy

Holarchy
Key Concept

Executive Functions cue and direct in different ways at different levels.
EF Tiers within the Holarchical Model of Executive Functions

Trans-Self Integration
Self-Generation
Self-Realization
Self-Determination
Self-Regulation
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Perceive
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Self-Awareness
Other-Awareness
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Goal setting
Long-range Planning & Foresight

Activation
Self Activation

Initiation and “ramping up” of basic executive functions related to an awakened state of mind and to overcoming sleep inertia.

Self-Activation
Self Activation Interventions

How do you take control of a brain whose control center is not awake?
Executive Functions and Language

- It is important to recognize that language does not necessarily connote consciousness.
- Language can be used by executive functions as a form of conscious expression and as a tool to modify brain function.
System 1 – Fast, effortless, automatic

System 2 – Slow, effortful, non-automatic
Self Activation Interventions

- How do you take control of a brain whose control center is not awake?
- Use behavioral conditioning to create an automatically activated stimulus-response routine (alarm rings, get out of bed, turn on lights, get in the shower)
Self Regulation

- A set of control capacities that cue and direct functioning across the domains of perception, emotion, cognition, and action
- The current model posits 33 self-regulation executive functions
33 Self-Regulation EFs

- Perceive
- Focus
- Sustain
- Energize
- Initiate
- Inhibit
- Stop
- Interrupt
- Flexible
- Shift
- Modulate
- Balance
- Monitor
- Correct
- Gauge
- Anticipate
- Est Time
- Analyze
- Generate
- Associate
- Plan
- Organize
- Prioritize
- Compare/Eval
- Decide
- Sense Time
- Pace
- Sequence
- Execute
- Hold
- Manipulate
- Store
- Retrieve
Key Concept

Self-regulation Executive Functions can be organized into 7 basic clusters.
Self Regulation Executive Function “Clusters”

**ATTENTION**
- Perceive
- Focus
- Sustain

**ENGAGEMENT**
- Energize
- Initiate
- Inhibit
- Stop
- Pause
- Flexible
- Shift

**OPTIMIZATION**
- Monitor
- Modulate
- Balance
- Correct

**EFFICIENCY**
- Sense Time
- Pace
- Sequence
- Execute

**MEMORY**
- Hold
- Manipulate
- Store
- Retrieve

**INQUIRY**
- Anticipate
- Gauge
- Analyze
- Estimate Time
- Compare

**SOLUTION**
- Generate
- Associate
- Prioritize
- Plan
- Organize
- Decide
Tools of the Mind (Bodrova & Leong) is an effective preschool /kindergarten curriculum that helps young children improve self-regulation executive functions.
Bronson & Merryman discuss their observations of the Tools of the Mind curriculum in Chapter 8 Can Self-Control Be Taught?
EF Tiers within the Holarchical Model of Executive Functions

Trans-Self Integration

Self-Generation

Self-Realization
- Self-Awareness
- Other-Awareness
- Self-Analysis

Self-Determination
- Goal setting
- Long-range Planning & Foresight

Self-Regulation
- Perceive
- Focus
- Sustain
- Energize
- Initiate
- Inhibit
- Stop
- Interrupt
- Flexible
- Shift
- Modulate
- Monitor
- Correct
- Balance
- Gauge
- Anticipate
- Estimate Time
- Analyze
- Generate
- Associate
- Organize
- Prioritize

Self-Activation
- Plan
- Evaluate/Compare
- Decide
- Sense Time
- Pace
- Sequence
- Execute
- Hold
- Manipulate
- Store
- Retrieve
Self Realization (of self & others)

- Directs cognitive processes that engage in awareness of self and others, reflection about self and others and self-analysis.
- Cues cognitive processes to access accumulated information about self and apply it in specific situations.
EF Tiers within the Holarchical Model of Executive Functions

Trans-Self Integration

Self-Generation
- Goal setting
- Long-range Planning & Foresight

Self-Realization
- Self-Awareness
- Other-Awareness
- Self-Analysis

Self-Regulation
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- Interrupt
- Flexible
- Shift
- Modulate
- Monitor
- Correct
- Balance
- Gauge
- Anticipate
- Estimate Time
- Analyze
- Generate
- Associate
- Organize
- Prioritize

Self-Awareness

Other-Awareness

Self-Determination
- Goal setting
- Long-range Planning & Foresight

Self-Activation

Activation
Foresight/Long-Term Planning and Goal Generation

Directs the use of cognitive processes to construct visions of the future and plans for action over longer periods of time. Attempts to align daily self-regulation with long-term goals.
Chapter 21
Motivational Interviewing with Adolescents and Young Adults

John S. Baer and Peggy L. Peterson
Motivational Interviewing with Adolescents and Young Adults

Sylvie Naar-King
Mariann Suarez
EF Tiers within the Holarchical Model of Executive Functions

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Goal setting
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Interrupt
Flexible
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Modulate
Monitor
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Gauge
Anticipate
Estimate Time
Analyze
Generate
Associate
Organize
Prioritize

Self-Activation
Activation

Permit
Plan
Evaluate/Compare
Decide
Sense Time
Pace
Sequence
Execute
Hold
Manipulate
Store
Retrieve
Self Generation

- Directs the posing of speculative questions related to the meaning and purpose of life and/or the ultimate source(s) of reality and physical existence, mind-body relationships, spirit, and soul; contemplates existence beyond the physical plane.

- Directs the generation of a philosophy of life used to guide self-awareness, self-realization and the other levels of executive function processes; serves as a basis for an ultimate source of intentional behavior direction.
EF Tiers within the Holarchical Model of Executive Functions

Trans-Self Integration

Self-Generation

Self-Realization
- Self-Awareness
- Other-Awareness
- Self-Analysis

Self-Determination
- Goal setting
- Long-range Planning & Foresight

Self-Regulation
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- Monitor
- Correct
- Balance
- Gauge
- Anticipate
- Estimate Time
- Analyze
- Generate
- Associate
- Organize
- Prioritize

Self-Activation

Activation
Trans-Self Integration

- Directs the engagement of mental processes that enable realization and experiencing of a trans-self state of ultimate or unity consciousness.

- In most spiritual traditions, this state is considered the highest achievement of human consciousness and therefore very different from the maladaptive states characteristic of clinical diagnoses of dissociative states.
Effective use of Executive Functions can vary by Arena of Involvement as well as by Domain of Functioning.
Arenas of Involvement

- **Intrapersonal**: Control of Self in Relation to Self
- **Interpersonal**: Control of Self in Relation to Others
- **Environment**: Control of Self in Relation to Surroundings
- **Symbol System**: Control of Self in Relation to Academics (Reading, Writing, Math)
Executive Functions are developing from birth; maturational delays can cause difficulties.
Some EF-based clinical syndromes, such as ADHD, demonstrate clear patterns of delayed developmental progression. Barkley (1998) estimates developmental delays of about 30% associated with various EF processes such as Inhibit, Manipulate, Shift, Sustain, Time, Monitor, Correct.
Developmental Progression with a 30% Delay
EF Development does not progress by continuous equal intervals
Development does not progress by continuous equal intervals
<table>
<thead>
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<td>Reading</td>
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<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td>ENGAGEMENT</td>
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</tr>
<tr>
<td>Rated 3, 2, or 1</td>
<td>78%</td>
</tr>
<tr>
<td>Rated 0</td>
<td>22%</td>
</tr>
<tr>
<td>ATTENTION</td>
<td></td>
</tr>
<tr>
<td>Rated 3, 2, or 1</td>
<td>78%</td>
</tr>
<tr>
<td>Rated 0</td>
<td>22%</td>
</tr>
<tr>
<td>WORK</td>
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</tr>
<tr>
<td>COMPLETION</td>
<td></td>
</tr>
<tr>
<td>Rated 3, 2, or 1</td>
<td>70%</td>
</tr>
<tr>
<td>Rated 0</td>
<td>30%</td>
</tr>
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Intervention efforts require a therapeutic perspective that emphasizes a Growth Mindset over a Fixed Mindset and a patient belief in the idea that EF difficulties “won’t last forever; but probably longer than you would like.”
Zeno’s Paradox

- An arrow is released at a target.
- At any point in the arrows flight toward the target, the distance between the arrow and the target can be halved.
- Mathematically, the distance between the arrow and the target therefore can be halved infinitely such that the arrow never really reaches the target.
Every intervention starts with an infinitely small step toward positive growth.

Each successive step doubles in impact.

Response to intervention therefore may not be noticeable until long after the intervention has started.

Once positive change is detectable, it seems to increase dramatically in a short period of time.
Virtually all individuals who struggle with psychological disorders exhibit executive function difficulties.
Deficits in PFC [prefrontal cortex, aka frontal lobes] function are evident in every neuropsychiatric disorder (indeed, the term “psychiatric problem” seems synonymous with PFC dysfunction).

Arnsten & Robbins 2002 in Principles of Frontal Lobe Function
Most of the clinical conditions described in the DSM-V reflect some form of Executive Dysfunction.

The DSM-V can be thought of as “A User’s Guide to All the Things That Can Go Wrong With the Frontal Lobes.”
Executive Functions and Clinical Diagnoses

- A sampling of conditions involving EF deficits:
  - Autism Asperger’s Syndrome
  - ADHD and ADD
  - Conduct Disorder
  - Oppositional Defiant Disorder
  - Depression and/or Anxiety
  - Obsessive-Compulsive Disorder
  - Fetal Alcohol Syndrome
All individuals with ADHD exhibit EF deficits but not all individuals that exhibit EF deficits are ADHD.
Executive Functions and ADHD?

All individuals with ADHD have executive functions deficits…

…but not all individuals with executive functions deficits have ADHD.
Executive Functions and ADHD

- EF and ADHD are not synonymous terms; rather ADHD is a condition involving EF deficits in:
  - Focus/Select, Sustain, Inhibit, Modulate
- Nearly all persons with ADHD also have additional self-regulation difficulties; the nature of these additional difficulties is what makes ADHD so variable from one person to the next and what causes confusion in diagnosis.
Executive Functions and ADHD

- Pharmacological treatment of ADHD usually only addresses the problems associated with the EFs specific to ADHD (Inhibit, Modulate, Focus/Select, Sustain)
- Most persons with ADHD will require additional interventions to assist with the additional self-regulation difficulties that persist even when medication is being used effectively to treat the primary ADHD problems.
Producing difficulties are different from learning difficulties; producing difficulties reflect poor use of executive functions.
Executive Function difficulties of a severe nature (especially in the Symbol System Arena) do not result in Learning Difficulties; they result in Producing Difficulties.
A General Model for Conceptualizing Learning and Producing Difficulties

- Learning Difficulties Only
  - Often NOT recognized as a Learning Disability, even when severe, unless an evaluation involving process assessment is done

- Learning Difficulties and Producing Difficulties
  - Recognized fairly quickly as a Learning Disability

- Producing Difficulties Only
  - When severe, typically attributed to lack of motivation, character flaws, or behavior/personality problems
Executive Functions and Intelligence

- The concept of executive functions is not synonymous with the traditional concepts of intelligence or “IQ”
- Executive functions are not directly assessed with standard intelligence tests
Directions for the Wisconsin Card Sorting Test (WCST):

I can’t tell you much about how to do this task. Which of these do you think this one goes with? I’ll tell you if your answer is right or wrong.
Executive Functions and School

The more classroom instruction resembles tests of executive functions like the Wisconsin Card Sorting Test (figure out what we’re learning, I’ll tell you whether you are right or wrong), the more executive difficulties are going to impact classroom learning and performance.
The McCloskey Executive Function Scales (MEFS) assess 33 self-regulation executive functions across multiple domains of function within multiple arenas of involvement.
<table>
<thead>
<tr>
<th>Rating</th>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>AA</td>
<td>Always or almost always does this on his or her own. Does not need to be prompted or reminded (cued) to do it.</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>Frequently does this on own without prompting</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>Seldom does this on own without being prompted, reminded, or cued to do so.</td>
</tr>
<tr>
<td>2</td>
<td>AP</td>
<td>Does this only after being prompted, reminded, or cued to do it.</td>
</tr>
<tr>
<td>1</td>
<td>DA</td>
<td>Only does it with direct assistance. Requires much more than a simple prompt or cue to be able to get it done in situations that require it.</td>
</tr>
<tr>
<td>0</td>
<td>UA</td>
<td>Unable to do this, even when direct assistance is provided.</td>
</tr>
</tbody>
</table>
The focus of a traditional FBA:

“Behavior support plans are designed to alter patterns of problem behavior. The process by which this is done, however, involves change in the behavior of family, teachers, staff, or managers in various settings. Plans of behavior support define what we will do differently. It is the change in our behavior that will result in improved behavior of the focus person.” (O’Neill, Horner, Albin, Sprague, Storey, & Newon, 1997, p. 65).
In traditional functional behavior assessments antecedents are said to TRIGGER the behavior that results in the consequences, but the reasons WHY the antecedents trigger the behavior is not really addressed.
FBA: Is A-B-C Enough?

- Since the antecedent does not trigger the same undesirable behaviors in ALL students in the same situation, there must be something about the students that differs in an important way.
- Functional behavior assessment ignores internal considerations (i.e., perceptions, emotions, thought) and focuses on applying external control to effect change in behavior.
Informed by knowledge of executive functions, the functional behavior assessment model can be revised as follows:

The EF Driven FBA

Antecedents

Perception
Emotion
Cognition
Action

EF

Behavior Response

Consequences
An EF-Driven FBA enables problems to be clearly stated in terms of perceptions, emotions, thoughts or actions that can be changed through intervention.
The goals of an EF-driven FBA are:
1) to help the child, the parents, and professionals to understand the nature of the deficit and
2) through proper intervention, to assist the child or adolescent in changing the behavior from a negative to positive.
Progress Monitoring

Progress monitoring techniques for interventions targeting the improvement of the use of executive functions.
<table>
<thead>
<tr>
<th>Duration</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>1</td>
<td>Never 0% of the time.</td>
</tr>
<tr>
<td>2</td>
<td>Occasionally Approximately 10% of the time.</td>
</tr>
<tr>
<td>3</td>
<td>Sometimes Approximately 20%-40% of the time.</td>
</tr>
<tr>
<td>4</td>
<td>Often Approximately 50%-70% of the time.</td>
</tr>
<tr>
<td>5</td>
<td>Very Often Approximately 80% of the time.</td>
</tr>
<tr>
<td>6</td>
<td>Almost Always Approximately 90% of the time.</td>
</tr>
<tr>
<td>7</td>
<td>Always 100% of the time.</td>
</tr>
</tbody>
</table>

1
Unable to focus and sustain attention for more than a few seconds when independently working on tasks.

2
Able to focus and sustain attention for about 1 minute when working independently on tasks.

3
Able to focus and sustain attention for about 2-3 minutes when working independently on tasks.

4
Able to focus and sustain attention for about 5 minutes when working independently on tasks.

5
Able to focus and sustain attention for about 10 minutes when working independently on tasks.

6
Able to focus and sustain attention for about 15 minutes when working independently on tasks.

7
Able to focus and sustain attention for 20 or more minutes when working independently on tasks.
### Goal 1: Managing Frustration and Engagement

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>3</td>
<td>Fully engaged without frustration</td>
<td>Maintained positive engagement throughout class and no frustration was apparent.</td>
</tr>
<tr>
<td>2</td>
<td>Frustration managed with self cued strategy</td>
<td>Frustration was apparent but was effectively managed and positive engagement occurred likely due to self-cued use of strategies.</td>
</tr>
<tr>
<td>1</td>
<td>Frustration managed with teacher cue or Reset</td>
<td>Frustration was apparent but was effectively managed and positive engagement occurred after teacher provided a cue for strategy use Or Zach returned after using the Reset strategy.</td>
</tr>
<tr>
<td>0</td>
<td>Frustration not managed</td>
<td>Frustration was apparent and strategy use was cued by teacher but positive engagement did not occur and student left class.</td>
</tr>
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Executive Function Difficulties

- Are they the result of:
  - Disuse through Nonconscious Choice
  - Maturational Delay
  - Innate Deficiency
  - Disuse through Conscious Choice
Executive Function Intervention

For intervention purposes, it is best to assume that EF deficiencies are the result of disuse through nonconscious choice. The general intervention goal then becomes education to make the child conscious of the EFs needed and how to engage them.
Interventions for EF Difficulties

- EF Self-regulation skills eventually need to be just that—Self-regulated.
- During classroom instruction, it is necessary to find the balance between providing enough EF SR cueing to help students function, but not too much to prevent EF skill-development.
- It is easy to underestimate the multiplicity of EFs required and focus only on those related to attention and organization.
Executive Function References

- Promoting Executive Functions in the Classroom–Lynn Meltzer (2010)
- Smart but Scattered – Dawson & Guare (2009)
- Late, Lost, and Unprepared – Cooper Kahn & Deitzel (2008)
- Assessment & Intervention for Executive Function Difficulties – McCloskey, Perkins & VanDivner (2009)
- Executive Functions in the Classroom – Chris Kaufman (2010)
EF Intervention Continuum

Orienting Strategies

External Control Strategies

Bridging Strategies

Internal Control Strategies
Interventions for EF Difficulties

Requires keeping in mind:

- The need to increase awareness and provide goals.
- The need to move from external control to internal control through bridging strategies.
- The environment in which intervention is happening: Requires those close to child to have reasonable EF capacities and be able to model those capacities.
Key Concept

Improving students’ executive functions starts with increased awareness and goal setting and progresses from external control to internal self-regulation.
Orienting Strategies increase awareness of executive functions and expectations for their use and provide self-regulation goals for students.
Explanation of Executive Functions

Frontal Lobes

Executive Functions

Reasoning

Attention

System 1: Thinking

System 2: Effortful Thinking
Engagement of Self-Determination and Self-Regulation

Self-Determination
Executive Functions

Self-Regulation
Executive Functions

Internal Command Pathway: Intrinsically Rewarding

Nucleus Accumbens
Chapter 21
Motivational Interviewing with Adolescents and Young Adults

John S. Baer and Peggy L. Peterson
External Control strategies enable an individual to perform more effectively but do not necessarily help to improve an individual’s capacity for self-regulated performance.
Rewards can be a tremendous benefit to an individual who has difficulty aligning internal desires with external demands. Use rewards, but heed the following cautions:
Using Rewards to Increase Production

- Rewards do not teach how to reflect on and alter perceptions, emotions, thoughts or actions, they simply reward the presence of desired behaviors.

- Reward programs imply that one can do it if he/she wants to or is motivated enough. This often leads away from the realization that many persons who are motivated and do want to change their behavior don’t know what to do to change it.
Punishment in mild form can be an effective means of obtaining compliance with external demands. When choosing to use punishment, heed the following cautions:
Punishment does not teach how to reflect on and alter perceptions, emotions, thoughts or actions, they simply punish the presence of undesired behaviors.

Punishment implies that a person can do it if he/she wants to or is motivated enough. This often leads away from the realization that many persons who are motivated and do want to change their behavior don’t know what to do to change it.
Provide predictable, consistent structure to classroom environments and routines:

- Post and discuss class rules and schedules
- Review and rehearse routines
- Maintain basic room arrangement
External Control Strategies

Provide external prompts and cues as a substitute for self-regulation.
Perceive cues the use of sensory and perception processes to take information in from the external environment or “inner awareness” to tune into perceptions, emotions, thoughts, or actions as they are occurring.

Prompt examples: “Listen to this.” “Look up at the board.” “How are you feeling right now?”
Focus cues the direction of attention and effort to the most relevant specifics (perceptions, emotions, thoughts, and/or actions) of a given environment, situation, or content while downgrading or ignoring the less relevant elements.

Prompt example: “Pay attention to what happens to the baking soda after the vinegar is added.”
Sustain cues sustained attention to the most relevant specifics (perceptions, emotions, thoughts, and/or actions) of a given environment, situation, or content.

Prompt example: “You will need to watch the computer screen carefully for the entire 10 minutes.”
Energize cues the investment of energy to the level needed to achieve the desired results

Prompt example: “This will require a lot of effort.” “You’ll need to focus all of your energy on task if you want to finish.”
Initiate cues the initial engagement of perceiving, feeling, thinking, or acting.

Prompt example: “Start walking now.” “Begin work on the count of five.”
**Inhibit**

- **Inhibit** cues resistance to, or suppression of, urges to perceive, feel, think, or act on first impulse.

- **Inhibit** prompts direct capacities to an alternate source rather than drawing attention to the perception, emotion, thought, or action that should be inhibited.

- **Prompt example:** “Don’t start until I tell you to go.”
Stop

- **Stop** cues the sudden, immediate discontinuation of perceiving, feeling, thinking, or acting.

- The **Stop** cue always precedes the Shift cue when altering problem-solving based on changing conditions, and switching or alternating attention.

- **Prompt example**: “Stop writing now.”
**Pause**

- **Pause** cues the brief cessation of, and the return to perceiving, feeling, thinking or acting.
- Efficient use of the **Pause** cue enables a quicker return to a previous mental state or activity.

- **Prompt example**: “Pause for a moment and listen, then I want you to go back to what you were doing.”
Flexible

- **Flexible** cues a willingness to alter the frame of reference for the direction and engagement of perceptions, emotions, thoughts or actions in reaction to what is occurring in the internal or external environments.

- **Prompt example**: “It doesn’t need to be done exactly the same way each time.”
**Shift**

- **Shift** cues a relatively quick change in the direction and engagement of perceptions, emotions, thoughts or actions in reaction to what is occurring in the internal or external environments.

- **Prompt example**: “The museum is closed for emergency repairs, so we won’t be able to go on the field trip.”
Monitor cues the activation of appropriate routines for checking the accuracy of perceptions, emotions, thoughts or actions.

Prompt example: “Periodically check the task directions to see if you are following all of them.”
Modulate/Adjust

- **Modulate** cues the regulation of the amount and intensity of mental energy invested in perceiving, feeling, thinking, and acting.

- **Prompt example**: “Let’s all use our indoor voices now.”
  “Please tone it down a bit.”
Balance cues the regulation of the trade-off between opposing processes or states (e.g., pattern vs detail; speed vs accuracy; humor vs seriousness) to enhance or improve experiencing, learning, or performing.

Prompt example: “Work as quickly as you can, but be careful not to make any mistakes.”
Correct cues the use of appropriate routines for correcting errors of perception, emotion, thought, or action based on feedback from internal or external sources.

Prompt example: “Correct any errors you find.”
Sense Time cues the monitoring of the passage of time (e.g., cueing the engagement of the mental functions that enable a person to have an internal sense of how long they have been perceiving, feeling, thinking or acting).

**Prompt example:** “How long have you been working on that?”
Pace cues the awareness of, and the regulation of, the rate at which perceptions, emotions, cognitions, and actions are experienced or performed.

Prompt example: “You will need to work quickly as there is not much time left.”
Sequence cues the orchestrating of the proper syntax of a series of perceptions, feelings, thoughts, and/or actions, especially in cases where automated routines are being accessed or are initially being developed.

Prompt example: “Remember the order of the steps needed for completion.”
Execute cues the engagement of a well-known series of perceptions, feelings, thoughts, and/or actions, especially in cases where automated routines have been practiced and used frequently.

Prompt example: “Use the routine you learned to do these.”
Hold cues activation of the necessary cognitive processes required to maintain information in working memory and continues cueing these processes until the information is manipulated, stored, or acted on as desired.

Prompt example: “Hold that thought while we hear a reaction from the other group.”
Manipulate cues the use of working memory and other cognitive processes for the manipulation of perceptions, feelings, thoughts or actions as they are being held in mind or being accessed in the environment.

Prompt example: “Visualize what it would look like if you turned it upside down.”
Store cues the movement of information about perceptions, feelings, thoughts and actions from the mental processing environment of the present moment into “storage” for possible retrieval at a later time.

Prompt example: “This is important; it will be on Friday’s quiz.”
Retrieve cues the activation of cognitive processes responsible for finding and retrieving previously stored information about perceptions, feelings, thoughts and actions.

The more specific the demands or constraints placed on the retrieval task, the greater the requirements for precision of retrieval cues.

Prompt example: “To answer the question correctly, you will probably need to recall all that we learned about photosynthesis.”
Gauge cues one to identify the demands (perceptual, emotional, mental, physical) of a task or situation and cues the activation of the resources needed to effectively engage the task or situation.

**Prompt example**: “Consider what it’s going to take to get this job done right.”
Foresee/Plan cues the anticipation of conditions or events in the very near future, such as the consequences of one’s own perceptions, feelings, thoughts and/or actions.

Prompt example: “If you keep erasing in that same spot, what do you think will happen to the paper?”
Estimate Time cues the use of time estimation routines (e.g., cueing the engagement of mental functions that enable a person to have an internal sense of how long something will take to complete, or how much time is still left in a specific period of time).

Prompt example: “Tell me how long you think this will take you to do.”
Analyze cues the realization of the need to examine more closely perceptions, feelings, thoughts or actions to obtain a greater understanding of a problem or situation.

**Prompt examples:** “Make a list of the positives and negatives and then compare them.” “Are there additional factors that need to be considered?”
**Compare/Evaluate**

- **Compare/Evaluate** cues the realization of the need to make comparisons among, or evaluate the adequacy of, perceptions, feelings, thoughts or actions.

- **Prompt examples:** “Did you complete all the steps?”
  “Does yours look like the model?”
  “Why do you think what you said was a good explanation?”
Prioritize cues the use of routines for ordering perceptions, feelings, thoughts, and/or actions, according to their relevance, importance, or urgency.

Prompt example: “Think about how important each of these tasks is, and then list them in order of importance so the most important ones get done first.”
Generate cues the realization that novel, fluid problem-solving efforts are required and cues the activation of the resources needed to carry out problem-solving routines.

Prompt example: “We haven’t tried to solve a problem like this one before.” “This problem will require some novel thinking if you are going to find a solution.”
Associate cues the realization that associations need to be made, and cues the activation of the resources needed to attempt to make the necessary associations.

**Prompt examples:** “Have you heard anything like that before?”

“This problem is very similar to one you worked on last week.”
Organize cues the use of routines for sorting, sequencing, or otherwise arranging perceptions, feelings, thoughts, and/or actions, to enhance or improve the efficiency of experience, learning, or performance.

**Prompt example:** “Let’s establish the order in which you need to do things to get this task done.”
Plan (Short-term)

- **Plan** cues the engagement of the capacities required to identify a series of perception, feelings, thoughts, and/or actions that, if carried out, would be most likely to produce a desired outcome in the very near future (within minutes to within several hours).

- **Prompt example**: “Write down what you will do over the weekend and when you will do it so that you will be ready for the test on Monday.”
Choose cues the need to achieve closure, i.e., to make a choice among alternatives now.

**Prompt example:** “Make a choice now.” “Pick one now.” “Choose now.”

The Choose cue often must be preceded by the Stop/Interrupt cue.

**Prompt example:** “You need to stop thinking about it and make a choice now.”
Provide time management aids, such as calendars, clocks, timers, schedules, peer leaders and coaches, work teams, etc.
Bridging strategies effect the gradual transition from external control to self-regulated internal control.
Bridging Strategies

Encourage the engagement of executive functions through the use of reflective questioning
Repeat the individual’s question back to them instead of providing an answer. In situations where the client seems unaware of the need to be asking questions for adequate engagement, reflective questioning involves the mediator asking the client a question that is intended to make the client aware of the need to engage executive functions.
Provide immediate and frequent feedback about the effectiveness of attempts to engage self-regulation executive functions. Providing individuals with feedback about their performance enables them to engage executive capacities more effectively to learn from their mistakes and improve future performance.
Feedback About Accuracy

When providing feedback, be sure to emphasize the importance of effort; make sure the individual realizes that self-regulation is not simply something you have or don’t have – it can be increased by applying techniques and strategies; the more effort placed into applying the techniques, the more likely the improvements.
Bridging Strategies

Model appropriate use of self-regulation executive function capacities
Teach self-regulation capacities with specific skill routines using Cognitive Strategy Instruction approaches (e.g. Graham & Harris Self-Regulated Strategy Development approach for Written Expression).
1. Explain the purpose of self-regulation strategies in general and describe and discuss the specific steps of the strategy that will be taught.
2. Model the use of the strategy using language and examples that connect with the students.
3. Students memorize the steps in the strategy as well as any mnemonics that are used as part of the strategy.
4. Teacher supports the implementation of the strategy by the students, scaffolding as necessary to help the students master the use of the strategy.
5. Students independently apply the self-regulated strategy covertly (in their own minds). Students and teacher collaboratively evaluate the effectiveness of student self-directed strategy application.
Source Acknowledgements

Best Practices in Writing Instruction
Edited by Steve Graham, Charles A. MacArthur, and Jill Fitzgerald

Brain Literacy for Educators and Psychologists
Virginia W. Berninger, Todd L. Richards
Writing as a Holarchically Organized Process

PLAN

Idea Generation

Language Representation

Text Transcription

Text Generation

Reviewing/Revising

ORGANIZE
Executive Functions and Writing

• What Evan wrote for me:

  My favorite game is … “mabul roling it is fun. I like making the box to role in to. I am pretty good as well. It is really interesting. It is so fun
Executive Functions and Writing

• What Evan told me:

“My favorite game is rolling marbles. I think it is fun. I just learned it yesterday. It can be pretty hard at times. It can be fun and it’s interesting if you make it challenging. I like making the boxes to roll the marbles into. You probably need to be pretty skilled with eye hand coordination to do it. To get up the ramp you need to roll it really fast.”
What Evan wrote for me:

My favorite game is... “mabul roling it is fun. I like making the box to role in to. I am pretty good as well. It is really interesting. It is so fun

What Evan told me:

“My favorite game is rolling marbles. I think it is fun. I just learned it yesterday. It can be pretty hard at times. It can be fun and it’s interesting if you make it challenging. I like making the boxes to roll the marbles into. You probably need to be pretty skilled with eye hand coordination to do it. To get up the ramp you need to roll it really fast.”
Steve Graham
Self-Regulated Strategy Development (SRSD)
1. Select a topic.
2. Brainstorm what you know and what you want to learn.
3. Organize your information using a visual web.
4. Review your visual web and identify any holes or disconnects.
Lemurs

**Habits**
- Active at night

**Looks**
- Large eyes
- Long tails
- Rings on tail

**Live**
- Jungle
- Trees
- Country??
- Zoos

**Eat?**
- What do they eat?

**Pets?**
- Can they be pets?

Web for what I know and what I want to learn
5. Gather new information and revise your visual web.

6. Use the visual web to help construct an outline for the report or to begin writing.

7. Review, plan and revise as you write.
8. Check the visual web; did you write what you wanted to write?

9. Add information that is missing; fix sentences that don’t say what you want to say.
A. Read the sentence silently and/or aloud.

B. Does the sentence make sense to you? What does it mean?

C. Is that what you meant to say?
D. What’s missing? What doesn’t make sense?

E. Restate what you want to write. Repeat it to yourself.

F. Write what you just said.

G. Read what you wrote; go through steps A-F if needed.
Bridging Strategies

Practice and rehearsal of the use of executive functions. This is the single best way to increase engagement and efficiency of the use of executive functions.
Whenever possible, use game formats and game strategies to practice the use of executive functions.
Simon Says Pay Attention: Help for Children with ADHD

Daniel Yeager & Marcie Yeager
Mastering Self-Control

THE marshmallow TEST

“Your view of human nature will change profoundly as you read this brilliant book.”
—DAVID KAHNEMAN, author of THINKING, FAST AND SLOW

WALTER MISCHEL
Align external demands with internal desires to maximize motivation.

- Allow self-selection or choice of assignments whenever possible
- Use high interest material to illustrate application of new knowledge and skills
Daniel H. Pink

author of the New York Times bestseller

A Whole New Mind

DRiVE

The Surprising Truth About What Motivates Us
Develop a common vocabulary and set of nonverbal symbols for describing or signifying self-regulation capacities and signaling their use (e.g., cueing flexibility with “The Coconut Story”)
Cognitive Strategy Instruction

Case Example:

Zach
Chapter 21
Motivational Interviewing with Adolescents and Young Adults

John S. Baer and Peggy L. Peterson

Page 320 - 332
“I’m here to help you get what you want, but in order to do that I need to know what it is that you want.”
Goal Setting with Zach

Zach’s self-selected long-term goals:

- Pass all classes in 8th grade
- Get promoted to 9th grade and attend 9th grade at the district Senior High School
Ross Greene’s Collaborative Problem-Solving

lost at school

Why Our Kids with Behavioral Challenges Are Falling Through the Cracks and How We Can Help Them

Ross W. Greene, Ph.D.
author of The Explosive Child
“When I was observing you in Science class, I saw that you just put your head down on the desk and stayed that way for most of the class. What happened?”
When asked specifically about his refusal to do classwork that day in Science class (as observed by the psychologist), Zach offered that he was not purposefully refusing to do the work, but that he was unable to get himself to do it, stating: “It feels like I am hitting a wall and the harder I try, the more it hurts.”
Using Zeke’s own descriptive metaphor, the psychologist explained to Zach that he was going to teach Zach strategies that would enable him to stop hitting the wall, step back and find the door in the wall, open the door and go through it; “Once inside the door, you are now in the control room of the brain and you can take control and make your brain do the things you want to achieve your goals.”
Goals developed through discussion with Zach about how to achieve his long-term goals:

- Improve my mood; get engaged with class
- Pay attention in class
- Complete class work and home work
It was also explained to Zach that it is possible to improve the capacity to respond on demand, especially if he were to have a strategy worked out that he could use in situations where demands were being made of him, such as the demands for participating in class and doing homework.
The Psychologist met with Zach and his mother to come up with strategies that he could use to achieve his immediate goals. After the strategies were developed, the psychologist summarized them in a powerpoint file.
The Powerpoint file was used to teach Zach how to use the strategies and used with school staff to help them understand how Zach was going to work on improving his behavior.
Zach’s Cognitive Strategy Powerpoint
Long-term Goals

Get passing grades in all subjects

Get promoted to 9th grade

Immediate Goals

Improve my mood; get engaged with class

Pay attention in class

Complete class work and home work
Ask: How am I doing right now? Do I feel good? Am I doing what I need to do for class?
Say: I need to use the Purple Elephants Strategy
Take a deep breath and relax.

Say: I need to adjust my attitude so I can have a good day.

Say: Looking at my Purple Elephants file will help me feel better.
Say: I am in control now!

Say: I feel better.
I’m ready to do what I need to do for class.
Ask: What should I be doing for class?

Say: OK, I’m on it.

or

Say: I’m not sure. I will ask for help.
How am I doing right now? Do I feel good? Am I doing what I need to do for class?

I need to use the Purple Elephants Strategy

I need to adjust my attitude so I can have a good day.

Looking at my Purple Elephants file will help me feel better.

I am in control now! OK, I feel better. I’m ready to do what I need to do for class.

What should I be doing for class?

OK, I’m on it. I’m not sure. I will ask for help.
Ask: Am I paying attention right now?
Say: I need to use the Focus Strategy
Yawn and Stretch.
Say: I am in control now!

Say: I am energized and ready to pay attention!
Say: What should I be doing for class?

Say: OK, I’m on it.

or

Say: I’m not sure.
I will ask for help.
Am I paying attention right now?

I need to use the Focus Strategy

Yawn and Stretch.

I am in control now!
I am energized and ready
To pay attention!

What should I be doing for class?

OK, I’m on it. I’m not sure.
will ask for help.
Ask: Am I doing my class work?
Say: I need to use the Just Do It Strategy
Say: I need to do my class work so I can earn a passing grade and go on to 9th grade next year.
Say: I am in control now!

Say: I am energized and ready to work!
Say: I can complete my class work if I know what I need to do and how to do it.  
Ask: Do I know how to do this work?”

Say: OK, I’m on it.  
or
Say: I’m not sure.  
I will ask for help.
Am I doing my class work?

I need to use the Just Do It Strategy

I need to do my class work so I can earn a passing grade and go on to 9th grade next year.

I am energized and ready to work!

I am in control now!

I can complete my class work if I know what I need to do and how to do it. Do I know how to do this work?”

OK, I’m on it. I’m not sure. will ask for help.
The psychologist created a list of cognitive distortions and related cognitive corrections that was used with Zach to discuss how he could change his thinking about school and academic tasks. The list was shared with Zach’s counselor who also worked with Zach on cognitive behavior therapy.
Cognitive Distortion

Dichotomous Thinking:
“I’m either a good student or a failure.”

Overgeneralizing:
“I hit the wall in class today and couldn’t find the door. I have no control over my emotions.”

Mindreading:
“I didn’t do all of the assigned work. I know the teacher is disappointed with me.”

Cognitive Correction

Contextual Thinking:
“Sometimes I perform poorly but many times I perform well.”

Specifying:
“I hit the wall today and couldn’t find the door. The next time I hit the wall, I will use my Purple Elephant strategy and find the door.

Mindsharing:
“I didn’t do all my work. I’ll let the teacher know that I plan to finish all of it if that is ok with him/her.”
**YOU ARE IN CONTROL!**
* Cognitive Distortions and Counteracting Cognitive Corrections Worksheet

Developed by George McCloskey, Ph.D. Philadelphia College of Osteopathic Medicine

<table>
<thead>
<tr>
<th>Cognitive Distortion</th>
<th>Cognitive Correction</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

209
Zach’s teacher’s met with the psychologist for 90 minutes to receive training on how to use a series of prompts to cue Zach to use the strategies he was learning to improve his engagement, attention and work completion during classes.
Teacher Training

- Deliver 1-3 prompts during class
- Provide daily ratings of engagement, attention and work completion based on need for and response to prompts
Prompt 1: Self-awareness cueing (Zach, you seem to be having some trouble with…)

Prompt 2: Zach, you need to use your _ _ strategy.

Prompt 3: Zach you need to use your reset strategy.
Zach self-cues engagement, attention and work completion

- If prompt 1 is used: Zach realizes the need to use his strategies
- If prompt 2 is used: Zach uses his strategy as suggested by teacher
- If prompt 3 is used: Zach leaves the room and uses his reset strategy.
### Goal 1: Managing Frustration and Engagement

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Notes</th>
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<tbody>
<tr>
<td>3</td>
<td>Fully engaged without frustration</td>
<td>Maintained positive engagement throughout class and no frustration was apparent.</td>
</tr>
<tr>
<td>2</td>
<td>Frustration managed with self cued strategy</td>
<td>Frustration was apparent but was effectively managed and positive engagement occurred likely due to self-cued use of strategies.</td>
</tr>
<tr>
<td>1</td>
<td>Frustration managed with teacher cue</td>
<td>Frustration was apparent but was effectively managed and positive engagement occurred after teacher provided a cue for strategy use.</td>
</tr>
<tr>
<td>0</td>
<td>Frustration not managed</td>
<td>Frustration was apparent and strategy use was cued by teacher but positive engagement did not occur and student left class.</td>
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### Frustration Management

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**Work Completion**

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**Attention**

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**Work Completion**

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<thead>
<tr>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
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</thead>
</table>

**Comments:**

- Modified: Yes  No
- Work completed with extended time? Yes  No

Class: _____________________________
## Progress Monitoring Form for Zach T

### Goal 1: Managing Frustration and Engagement

<table>
<thead>
<tr>
<th>0</th>
<th>Frustration not managed</th>
<th>Frustration was apparent and strategy use was cued by teacher but positive engagement did not occur and student left class.</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Frustration managed with teacher cue</td>
<td>Frustration was apparent but was effectively managed and positive engagement occurred after teacher provided a cue for strategy use.</td>
</tr>
<tr>
<td>2</td>
<td>Frustration managed with self cued strategy</td>
<td>Frustration was apparent but was effectively managed and positive engagement occurred due to self-cued use of strategies.</td>
</tr>
<tr>
<td>3</td>
<td>Fully engaged</td>
<td>Maintained positive engagement throughout class and no frustration was apparent.</td>
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</tbody>
</table>

### Goal 2: Focusing and Sustaining Attention During Class

<table>
<thead>
<tr>
<th>0</th>
<th>Attended none of the time</th>
<th>Attention was never focused or sustained during the class period.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Attended some of the time</td>
<td>Attention was focused and sustained occasionally during the class period.</td>
</tr>
<tr>
<td>2</td>
<td>Attended most of the time</td>
<td>Attention was focused and sustained often during the class period.</td>
</tr>
<tr>
<td>3</td>
<td>Attended the entire time</td>
<td>Attention was focused and sustained during the entire class period.</td>
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### Goal 3: Completing Assigned School Work

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<th>No work completed</th>
<th>No assigned school work and homework is completed during class time.</th>
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<tbody>
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<td>1</td>
<td>Some work completed</td>
<td>Some assigned school work and homework is completed during class time.</td>
</tr>
<tr>
<td>2</td>
<td>Most work completed</td>
<td>Most assigned class work and homework is completed during class time.</td>
</tr>
<tr>
<td>3</td>
<td>All work completed</td>
<td>All assigned class work and homework is fully completed during class time.</td>
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**Class:** Math

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<th>1</th>
<th>0</th>
<th>Work Modified: Yes</th>
<th>Comments/Work not completed: Work was appropriately engaged, need to give more feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>3</td>
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**Class:** Science

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Staff Collaboration/Consultation

- Staff requested to have the psychologist meet with Zach on a regular basis to reinforce the strategies and consult with teachers and staff.
Weekly ratings were summarized to help school staff monitor progress and provide Zach with feedback about his performance.
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### Work Completion Dates

**Week 1**
- **4-Feb**: Math 3, Science 3, Social Studies 3, English 3, Reading 3, Math Facts 3
- **5-Feb**: Math 3, Science 3, Social Studies 3, English 3, Reading 3, Math Facts 3
- **6-Feb**: Math 3, Science 3, Social Studies 3, English 3, Reading 3, Math Facts 3
- **7-Feb**: Math 3, Science 3, Social Studies 3, English 3, Reading 3, Math Facts 3
- **8-Feb**: Math 3, Science 3, Social Studies 3, English 3, Reading 3, Math Facts 3

**Week 2**
- **11-Feb**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **12-Feb**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **13-Feb**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **14-Feb**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **15-Feb**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 3**
- **19-Feb**: Math 1, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **20-Feb**: Math 1, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **21-Feb**: Math 1, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **22-Feb**: Math 1, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **23-Feb**: Math 1, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 4**
- **25-Feb**: Math 0, Science 0, Social Studies 0, English 1, Reading 2, Math Facts 3
- **26-Feb**: Math 0, Science 0, Social Studies 0, English 1, Reading 2, Math Facts 3
- **27-Feb**: Math 0, Science 0, Social Studies 0, English 1, Reading 2, Math Facts 3
- **28-Feb** to **1-Mar**: Math 0, Science 0, Social Studies 0, English 1, Reading 2, Math Facts 3

**Week 5**
- **4-Mar**: Math 3, Science 0, Social Studies 2, English 3, Reading 3, Math Facts 0
- **5-Mar**: Math 1, Science 2, Social Studies 1, English 2, Reading 3, Math Facts 0
- **6-Mar**: Math 2, Science 2, Social Studies 1, English 3, Reading 3, Math Facts 0
- **7-Mar**: Math 1, Science 2, Social Studies 1, English 3, Reading 3, Math Facts 0
- **8-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 6**
- **11-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **12-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **13-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **14-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **15-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 7**
- **18-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **19-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **20-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **21-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **22-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 8**
- **25-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **26-Mar** to **28-Mar**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 9**
- **1-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **2-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **3-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **4-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **5-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 10**
- **15-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **16-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **17-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **18-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **19-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 11**
- **22-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **23-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **24-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **25-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **26-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 12**
- **29-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **30-Apr**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **1-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **2-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **3-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 13**
- **6-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **7-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **8-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **9-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **10-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

**Week 14**
- **13-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **14-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **15-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0
- **16-May** to **17-May**: Math 0, Science 0, Social Studies 0, English 0, Reading 0, Math Facts 0

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**Zach T.**

### Work Completion

**WEEK 13**
- **6-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **7-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **8-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **9-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **10-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3

**WEEK 14**
- **13-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **14-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **15-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
- **16-May** to **17-May**: Math 0, Science 1, Social Studies 0, English 3, Reading 2, Math Facts 3
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<thead>
<tr>
<th>Category</th>
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<tr>
<td><strong>Engagement</strong></td>
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<td>78%</td>
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<td><strong>Attention</strong></td>
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<tr>
<td><strong>Work Completion</strong></td>
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<td>70%</td>
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</table>
Zach passed all of his classes.
Zach’s progress toward behavior goals were judged as reflecting adequate improvement.
Zach was promoted to 9th grade at the high school instead of being transferred to an alternative program.
Internal Control Strategies

The Marshmallow Test
Once learned and practiced, Internal Control Strategies enable students to effectively “run their own shows.”
Once learned, the child can use internalized “self-talk” as a means of increasing awareness of executive functions and of when and how to use them (e.g., modified Berninger mantra for writing: “What I can think I can say. What I can say I can write. What I can write I can revise.”)
Internal Control Strategy

Model and teach the use of self-administered reward routines to increase the use of self-regulation executive functions (e.g., teach the child how to “bargain with yourself” to get homework accomplished).
Teach the use of self-monitoring routines. These routines can be used to monitor and correct perceptions, feelings, thoughts, and actions.
Some specific educational programs are designed, either explicitly or implicitly, to improve students’ executive functions.
Cognitive Strategy Instruction

Case Example: Billy

Lack of Inhibition?
It is critical that the actual problem behavior and associated EF difficulties be specified clearly and accurately:

- Teacher used the terms Lack of Inhibition and Impulsivity to describe Billy’s behavior, but her behavioral descriptions of problem situations were really examples of lack of effective monitoring and modulating.

- Classroom observation confirmed that Billy’s difficulties resulted from a lack of monitoring of voice and activity levels and a lack of adjusting of the intensity of voice and activity levels.
Billy: Case Conceptualization

- Teacher only used a Stop prompt when voice or activity levels were in the unacceptable range.
- Billy was not aware of why he was being told to stop.
- Without awareness of the problem and help in finding a strategy to change voice and activity levels on command, Billy was unable to change his behavior.
Billy’s Intervention: Orienting Phase

- The psychologist described what he saw in the classroom and listened to Billy’s explanation of what was happening in the classroom.
- The psychologist helped Billy to think through why his behavior was viewed as disruptive by the teacher.
- The psychologist asked Billy to help find a solution to the classroom problems that resulted when he was unable to monitor and adjust his voice and activity levels.
- Billy and the psychologist concluded that Billy needed help learning how to monitor and modulate his voice and activity levels.
- The psychologist and Billy met with the guidance counselor to identify strategies that could be used to help Billy learn how to improve his ability to monitor and adjust his voice and activity levels.
The team (Billy, the psychologist and the guidance counselor) decided to use an activity similar to those used in the *Tools of the Mind* curriculum to help Billy learn how to monitor and adjust his voice level.
The guidance counselor and Billy played a game that Billy named “the Sounding Good Game.”

Billy and the counselor talked about the different voice levels (library, indoor and outdoor) and the best times to use each one.

In the first part of the sounding good game, the counselor would describe a setting an activity and Billy would tell the counselor the type of voice that would be good to use in that situation.
In the second part of the sounding good game, Billy got to choose a song to dance to while playing the game.

As Billy danced to the music, the counselor held up a card with a short sentence and a symbol for a specific voice level printed on it.

Billy would continue to dance while reading the sentence to himself and while thinking about saying the sentence out loud in the voice level that was shown on the card.

When the counselor stopped the music, Billy had to say the sentence in the voice level indicated on the card.

The counselor would give Billy feedback about the accuracy of his use of voice level.
Billy’s Intervention: Bridging Phase

- Billy and the counselor also played a modified version of the sounding good game; the counselor would show Billy a card with the description of an activity and Billy would read the description in the voice level appropriate for the activity.

- The counselor would give Billy feedback about the accuracy of his voice level when reading orally.
Billy’s Intervention: Bridging Phase

- Billy and the counselor discussed how he could use what he was learning about voice level control in the classroom.
- They decided that Billy’s teacher could cue him about the right voice level to use in a classroom activity by saying to Billy: “Billy, what voice level do you think we should be using now?”
- Billy’s teacher would also give him feedback about the accuracy of his response.
- The counselor explained to Billy that the
The counselor kept track of Billy’s progress informally by checking in with the teacher at least weekly.

Over the course of three months, Billy’s teacher usually reported that Billy was able to adjust his voice level in class, but most often only after being given the reflective question prompt.
Because Billy was still being provided with reflective questions at the end of the school year to get him to adjust his voice level, he played the sounding good games with the counselor a few times at the beginning of the next school year and his new teacher was asked to provide the reflective question prompt when Billy’s voice level was inappropriate for the situation.
Reflective questioning was used with Billy through September and October. During November, the teacher needed to use reflective questioning only twice.

Billy was able to self-regulate the monitoring and adjusting of his voice level for the rest of the school year without requiring reflective questioning.
Although no specific teaching was provided to help Billy adjust his activity level, the psychologist and the counselor discussed with Billy how he could use what he was learning about voice control to monitor and adjust his activity level.

The counselor provided Billy with examples of how he could think about a classroom activity and then think about how active he should be during that activity (using the same level names as voice – library, indoor, outdoor).

Billy’s teacher was asked to use the reflective question technique with Billy when his activity level was not appropriate for an activity and give him feedback about the accuracy of his response.

Billy was coached by the counselor to recognize the teacher’s reflective question as a prompt to monitor his activity level and adjust it.
Billy’s Intervention: Progress Monitoring

- The counselor kept track of Billy’s progress informally by checking in with the teacher at least weekly.

- Over the course of four months, Billy’s teacher reported that Billy was able to adjust his activity level in class, but usually only after being given the reflective question prompt.

- By the end of the school year, Billy was still requiring the use of the reflective question prompt, but usually not more than 1-2 times per week.