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

Presented by

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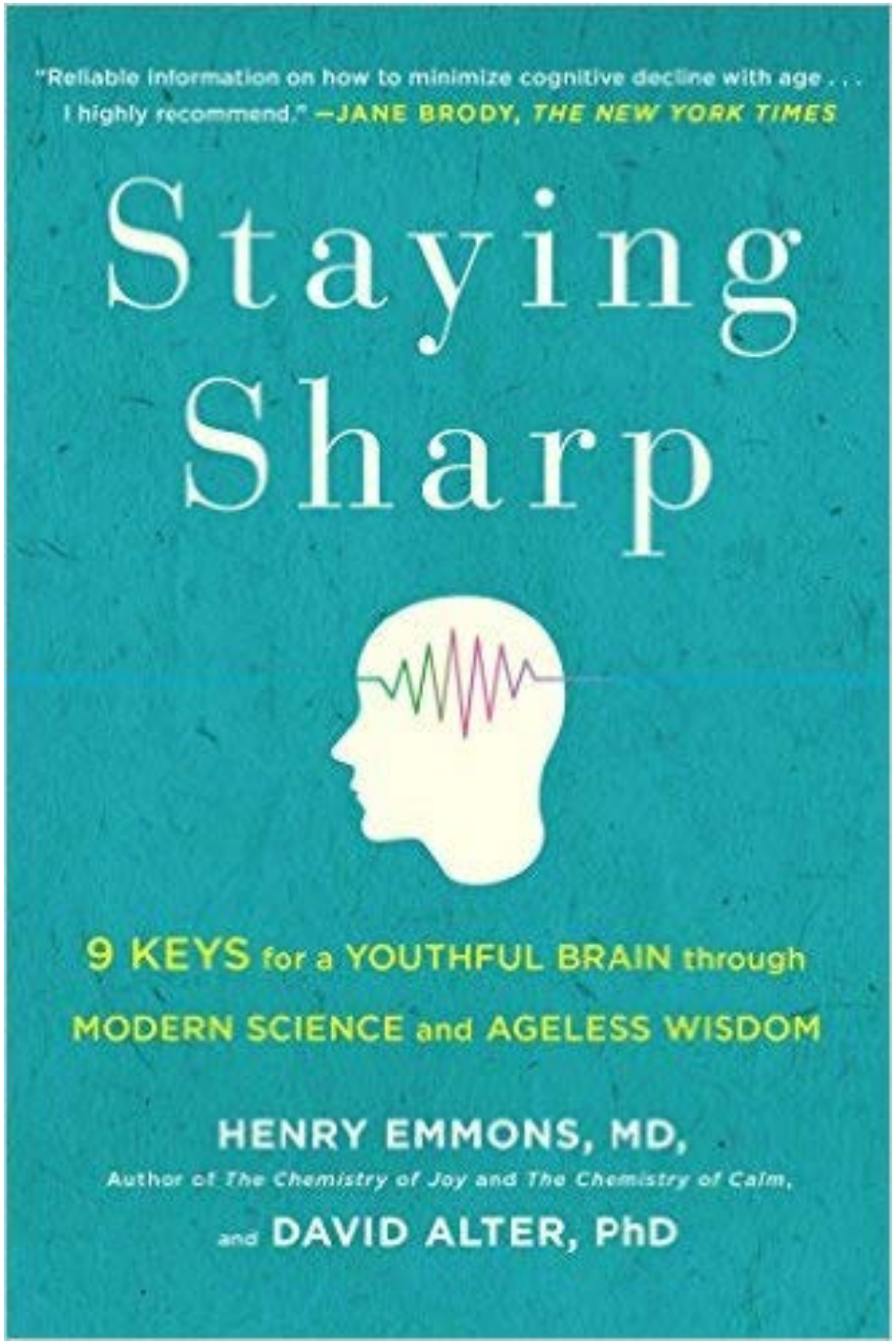
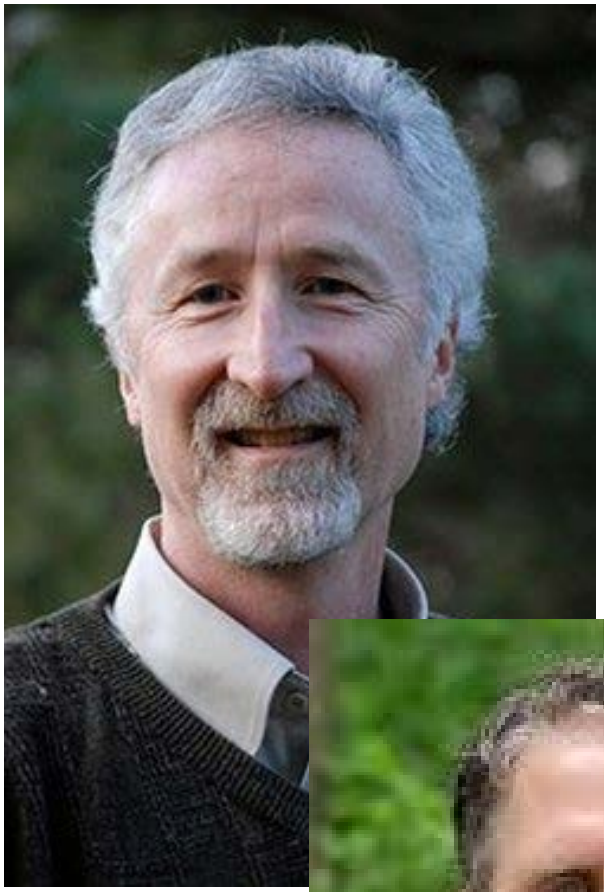
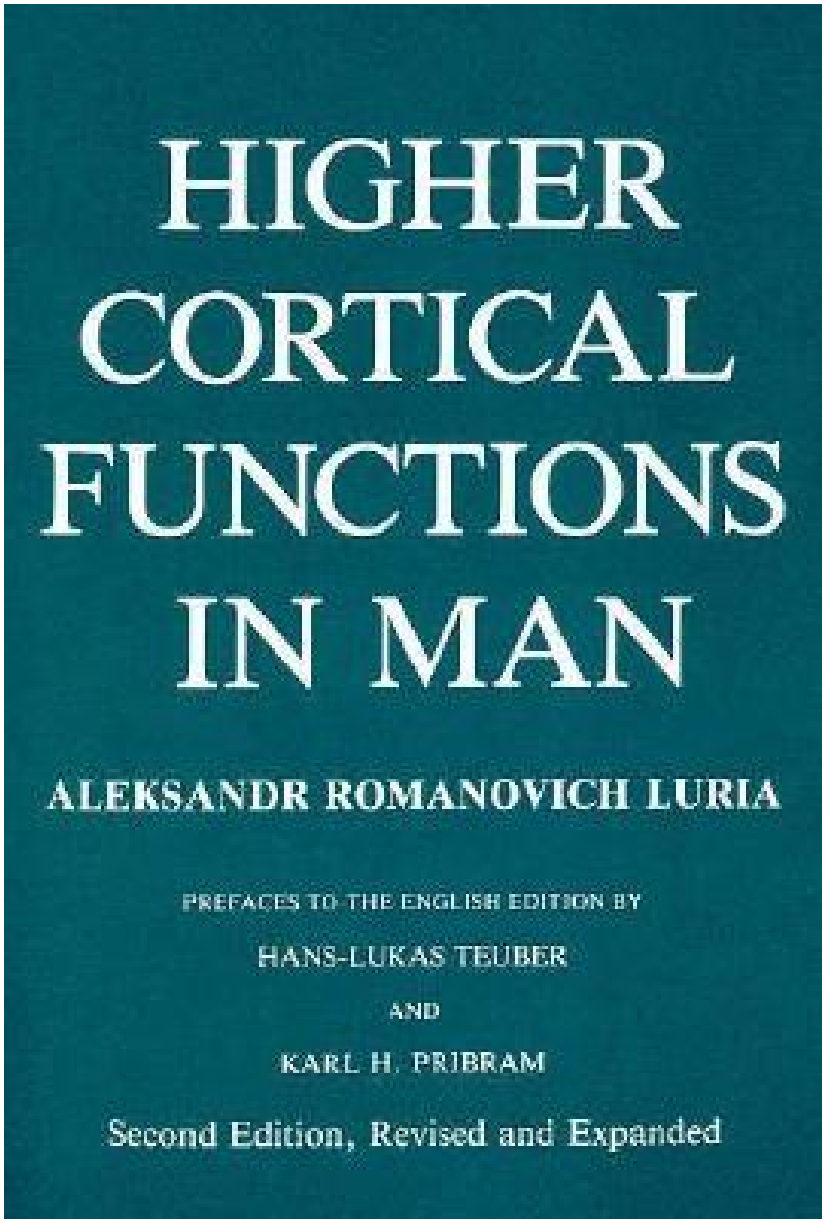
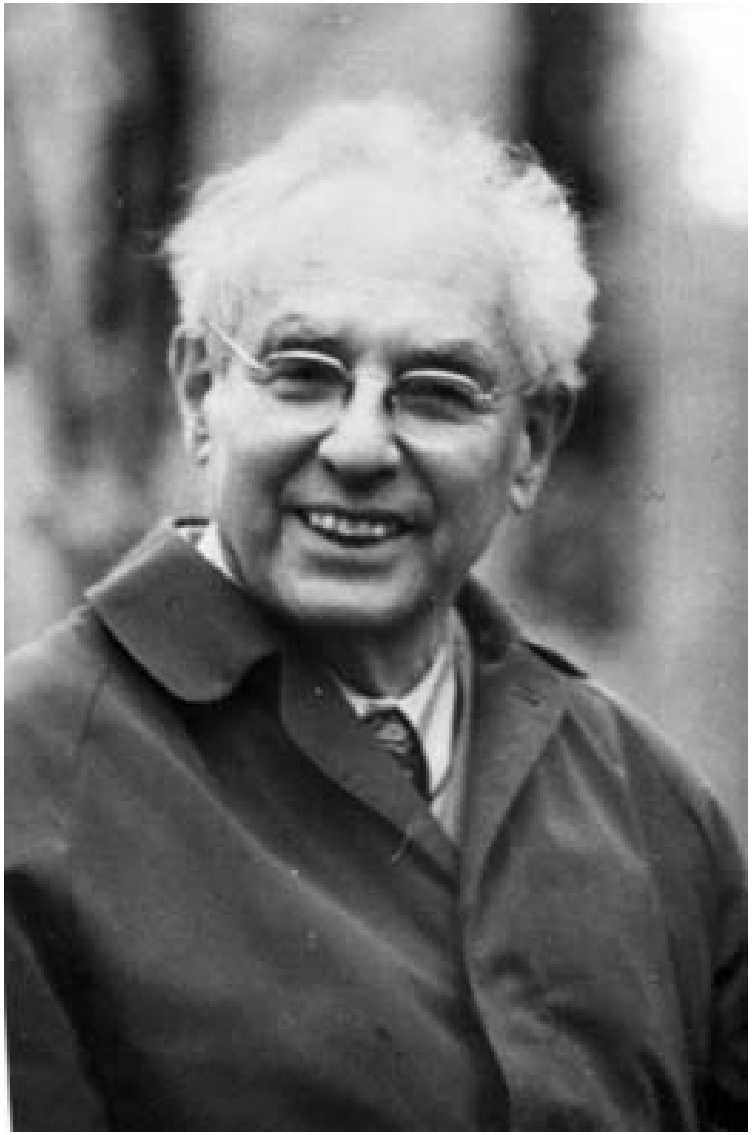

"Reliable information on how to minimize cognitive decline with age . . . I highly recommend." —JANE BRODY, THE NEW YORK TIMES
Staying Sharp
9 KEYS for a YOUTHFUL BRAIN through MODERN SCIENCE and AGELESS WISDOM
HENRY EMMONS, MD,
Author of The Chemistry of Joy and The Chemistry of Calm,
and DAVID ALTER, 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



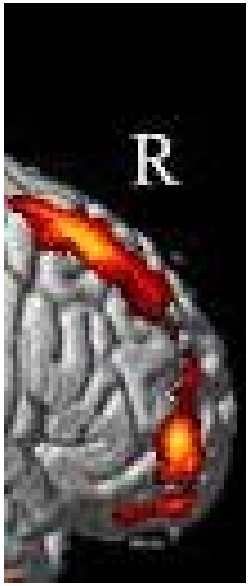
Key Concept

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)?



Key Concept

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.

Key Concept

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.

Key Concept

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.

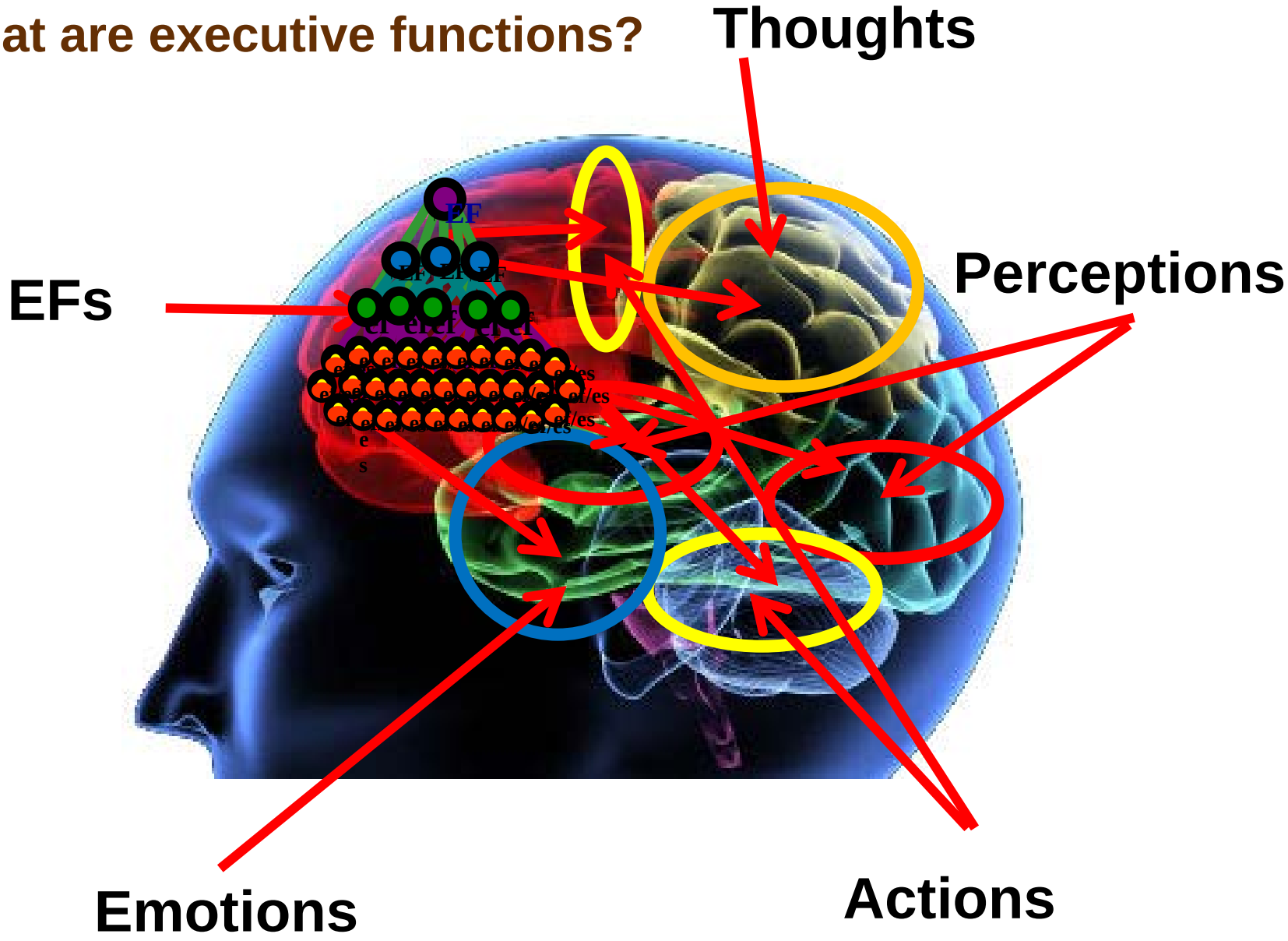
The Wisdom of Kurt Lewin

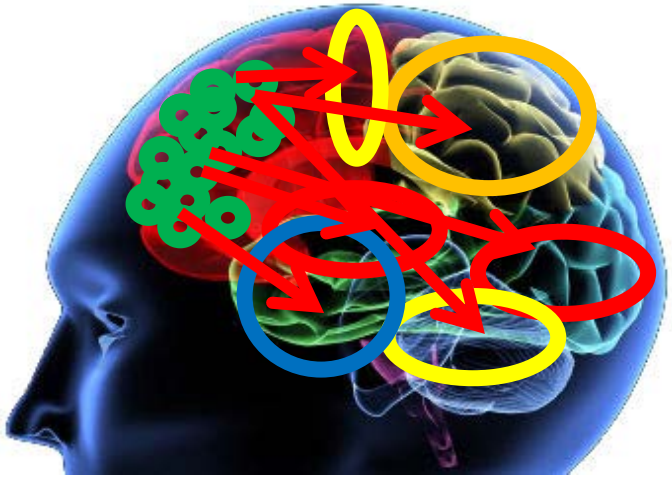
"There is nothing more practical than a good theory."

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")

What are executive functions?





Key Concept

Executive Functions:

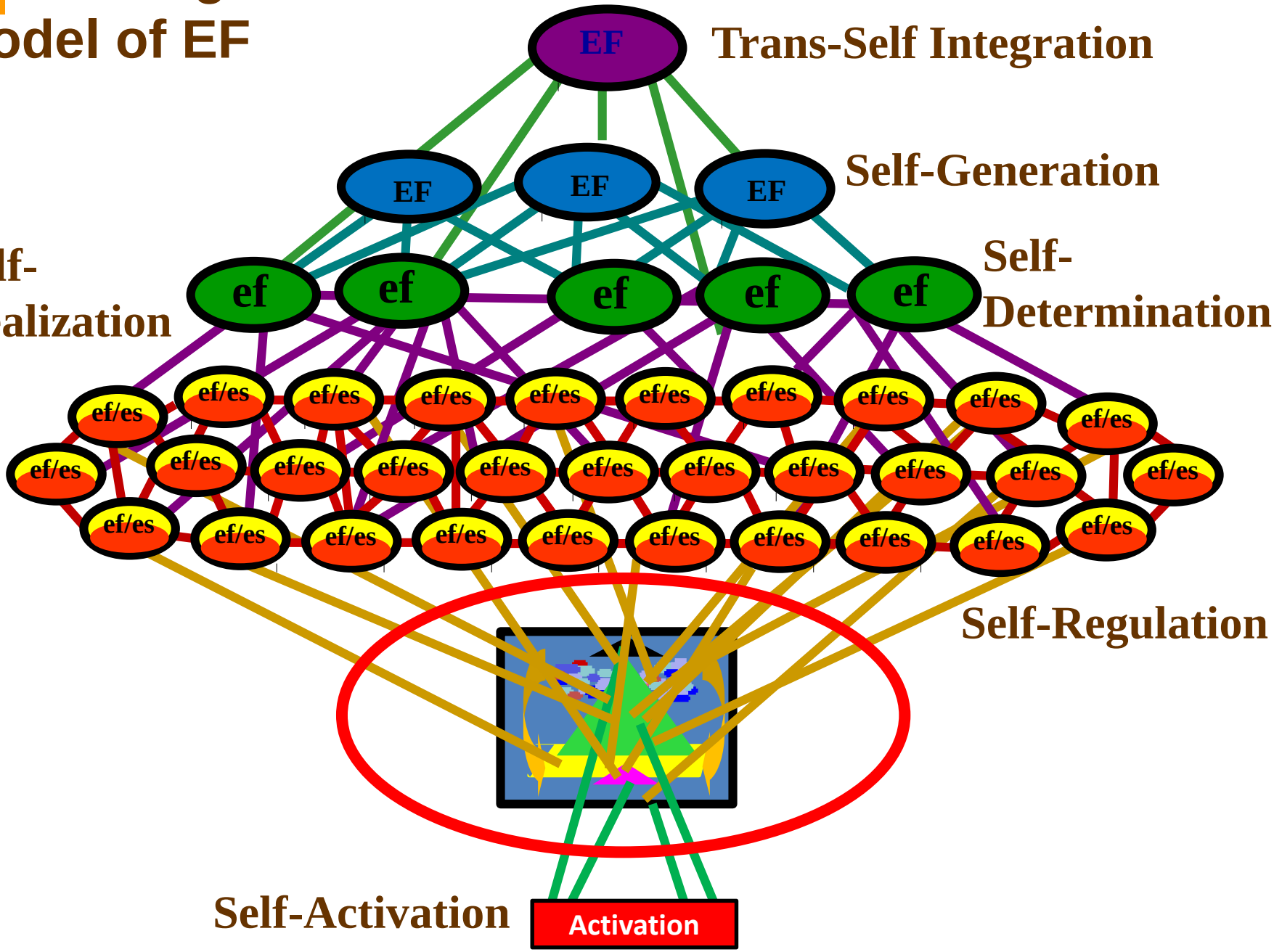
- Directive capacities of the mind
- Multiple in nature, not a single capacity
- Part of neural circuits that are routed through the frontal lobes
- Cue the use of other mental capacities
- Direct and control perceptions, thoughts, actions, and to some degree emotions

Executive Functions Are Not a Unitary Trait

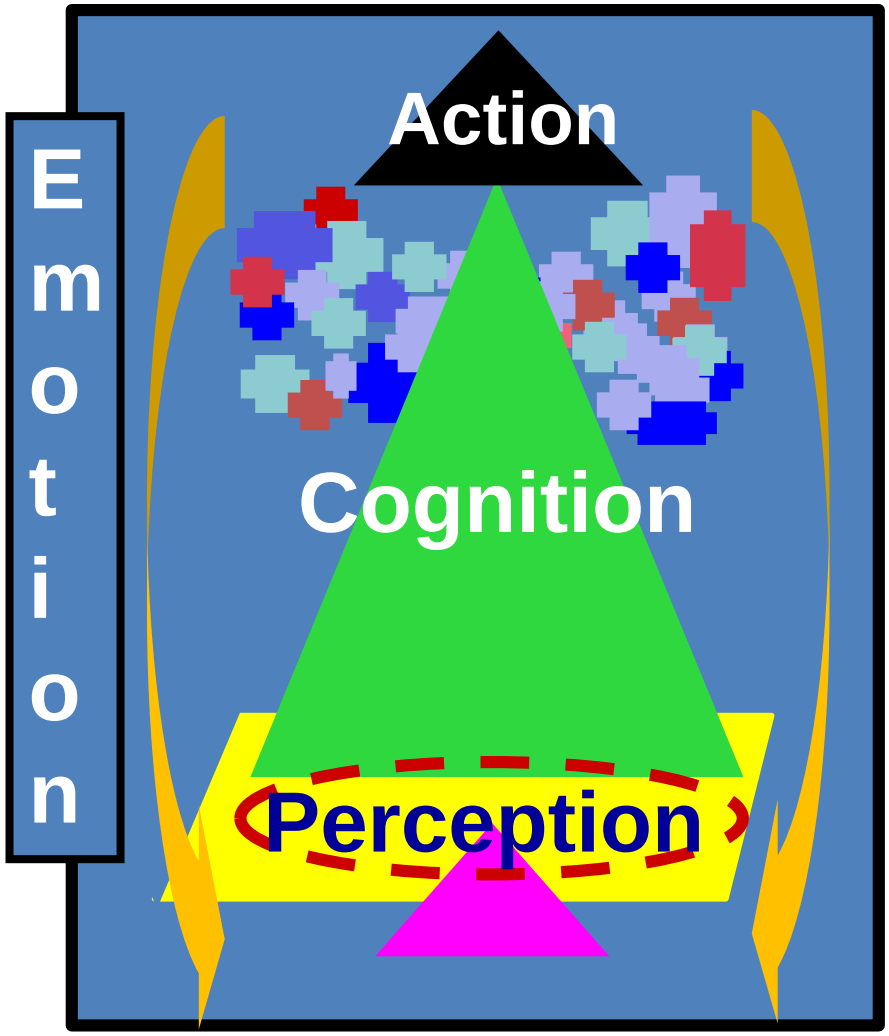
Appropriate Metaphors for Executive Functions:

- 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

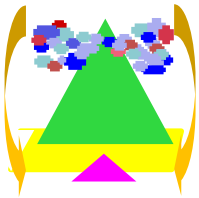


Domains of Functioning Directed by Executive Functions

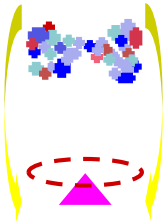


Action
Executive control of modes of output including behavior in the external world and storage and retrieval of internal representations

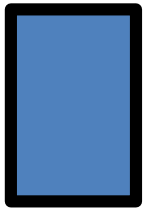
Cognition
Executive control of thoughts and thought processing



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



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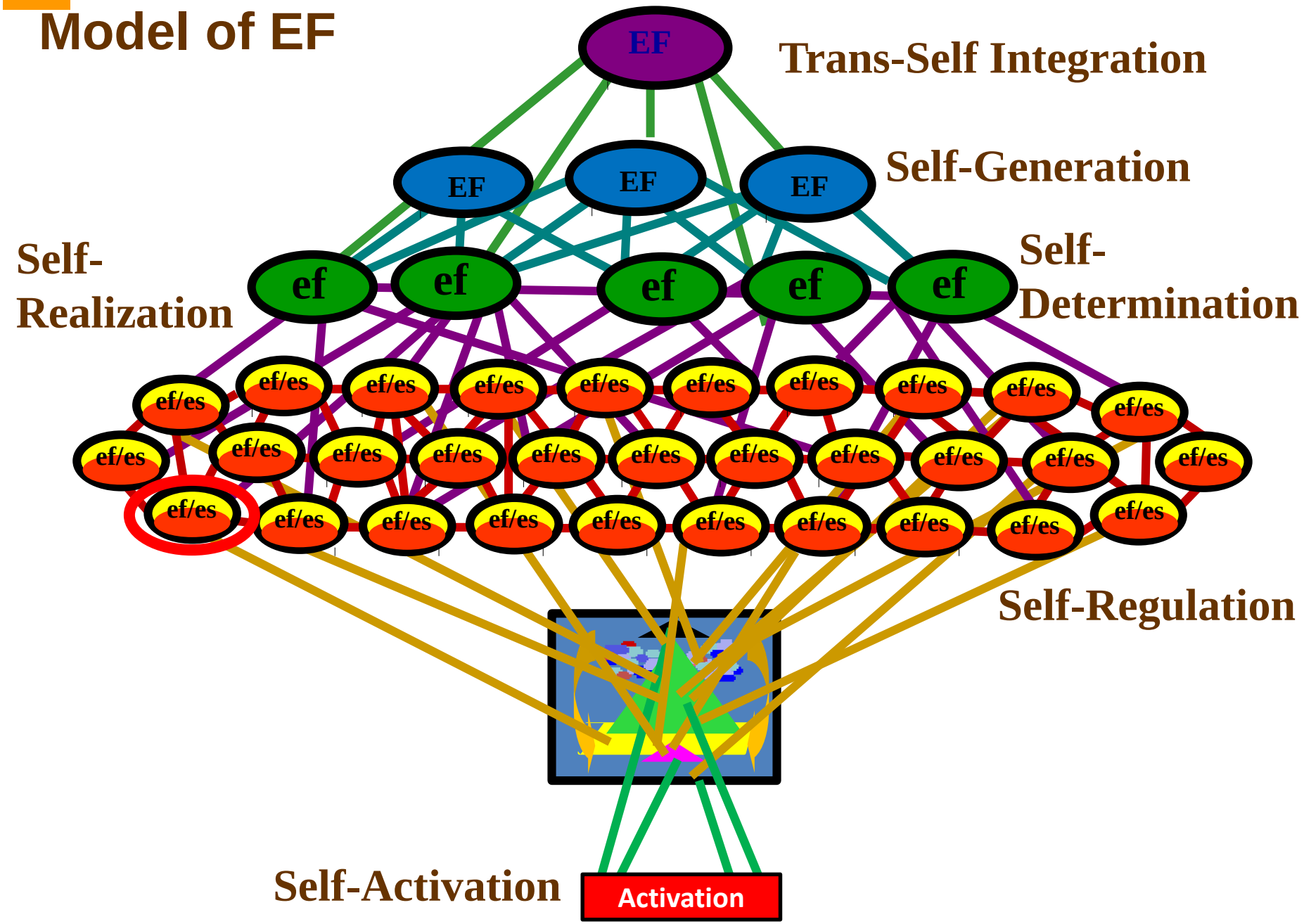

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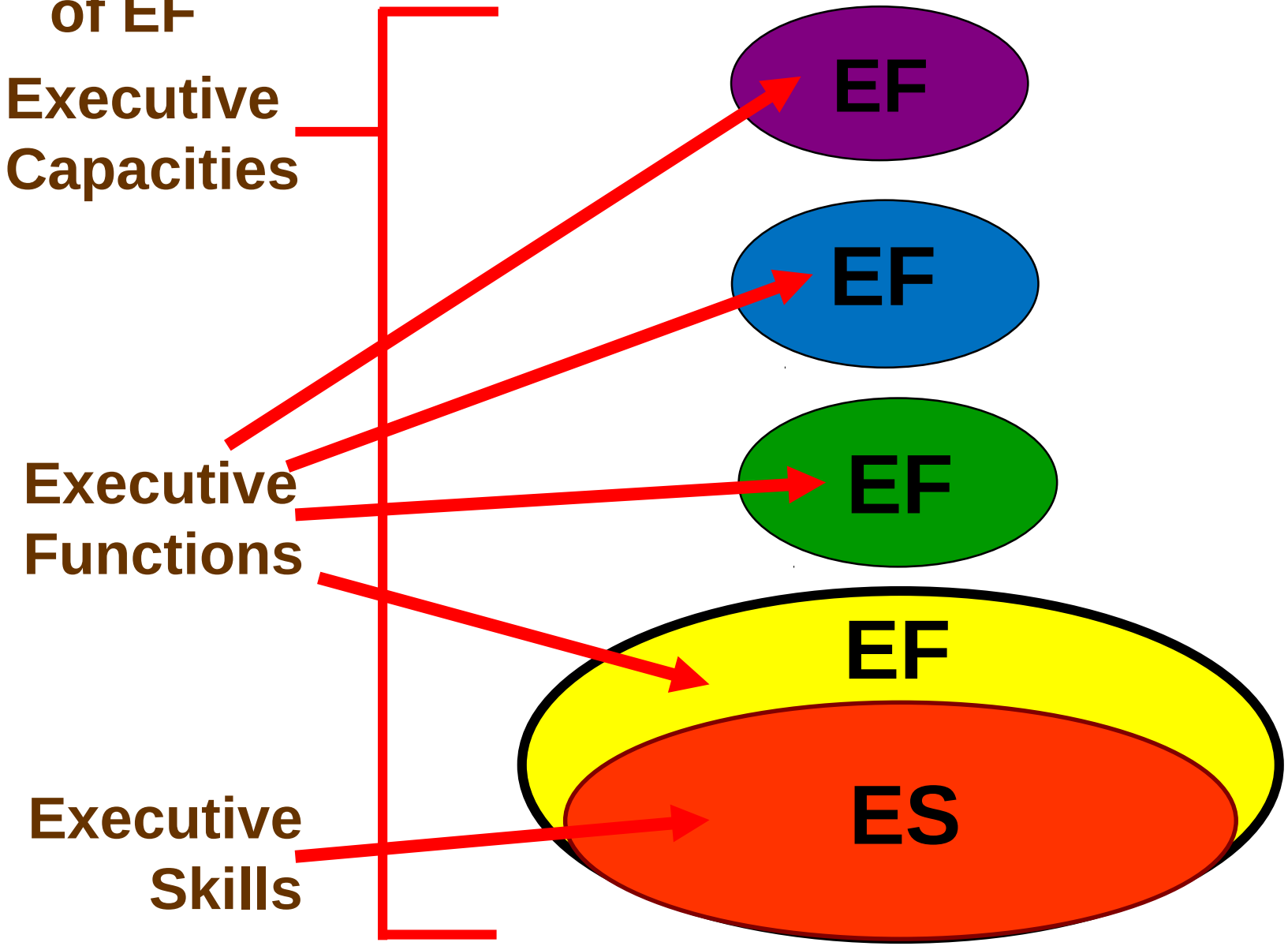

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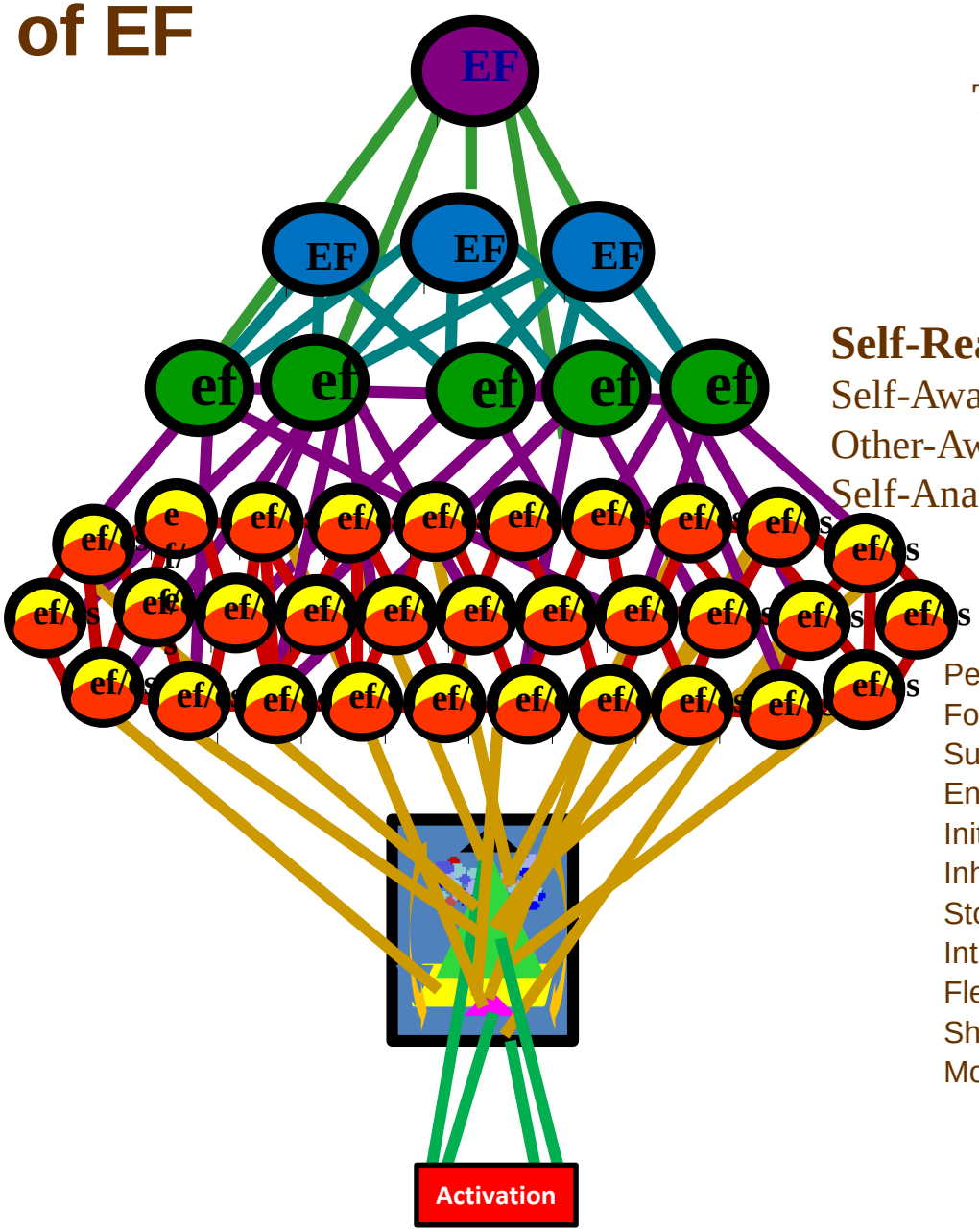
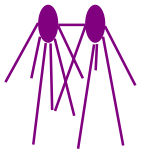


Trans-Self Integration

Self-Generation

Self-Realization

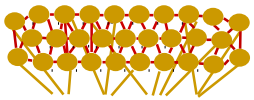
Self-Awareness
Other-Awareness
Self-Analysis



Self-Determination

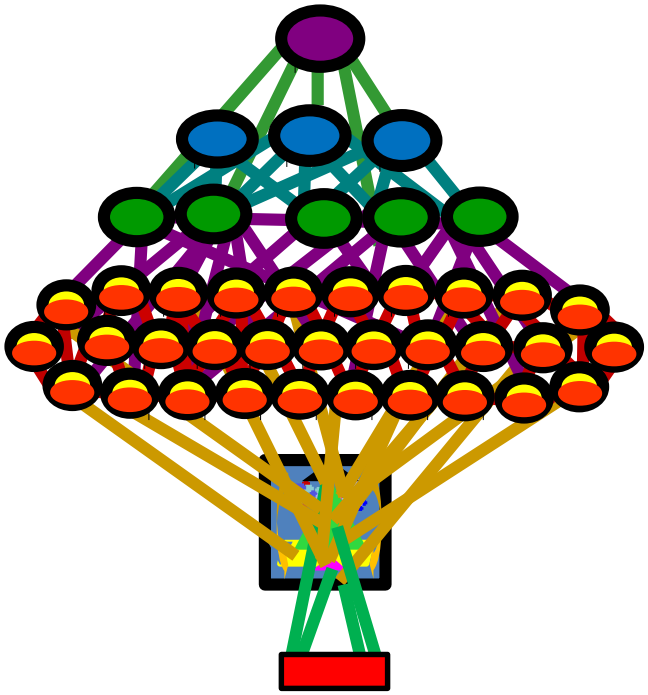
Goal setting
Long-range Planning & Foresight

Self-Regulation



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

Self-Activation



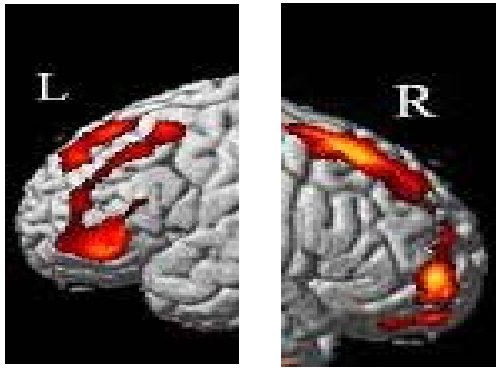
Key Concept

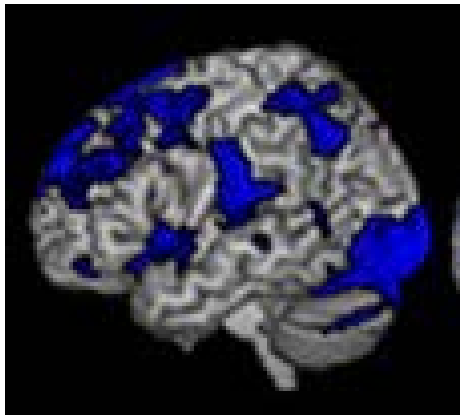
It is important to distinguish between

Executive Functions

and

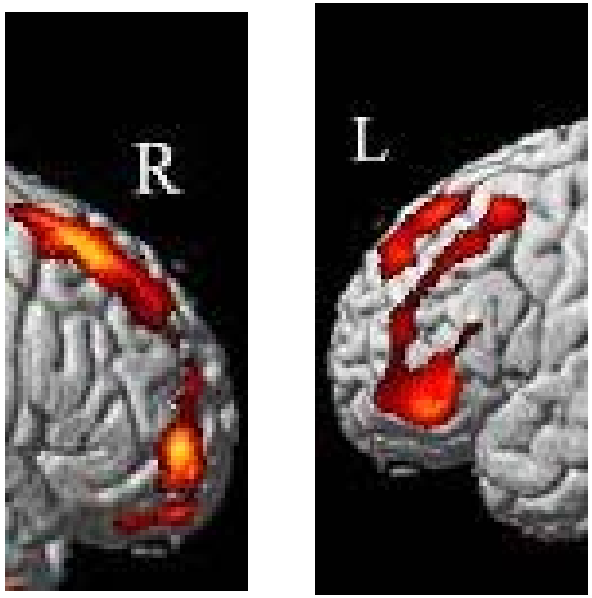
Executive Skills.





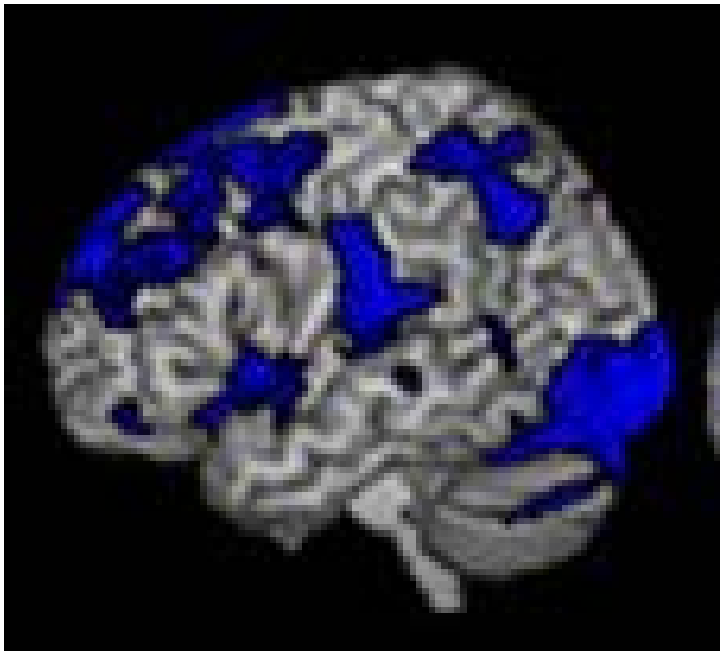
Self Regulation Executive Functions

Executive Functions involve the part of the executive network that 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.

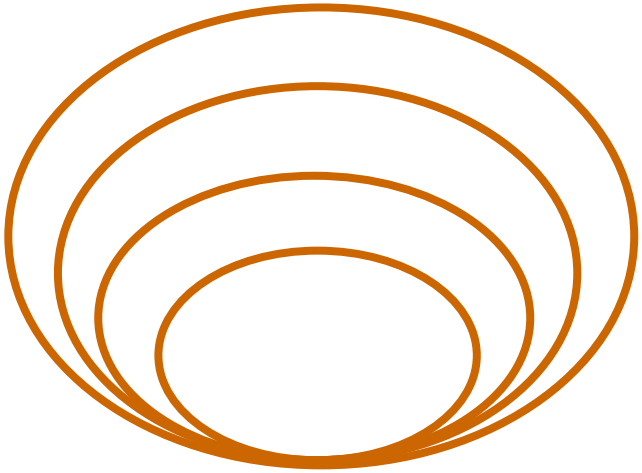


Self Regulation Executive Skills

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).

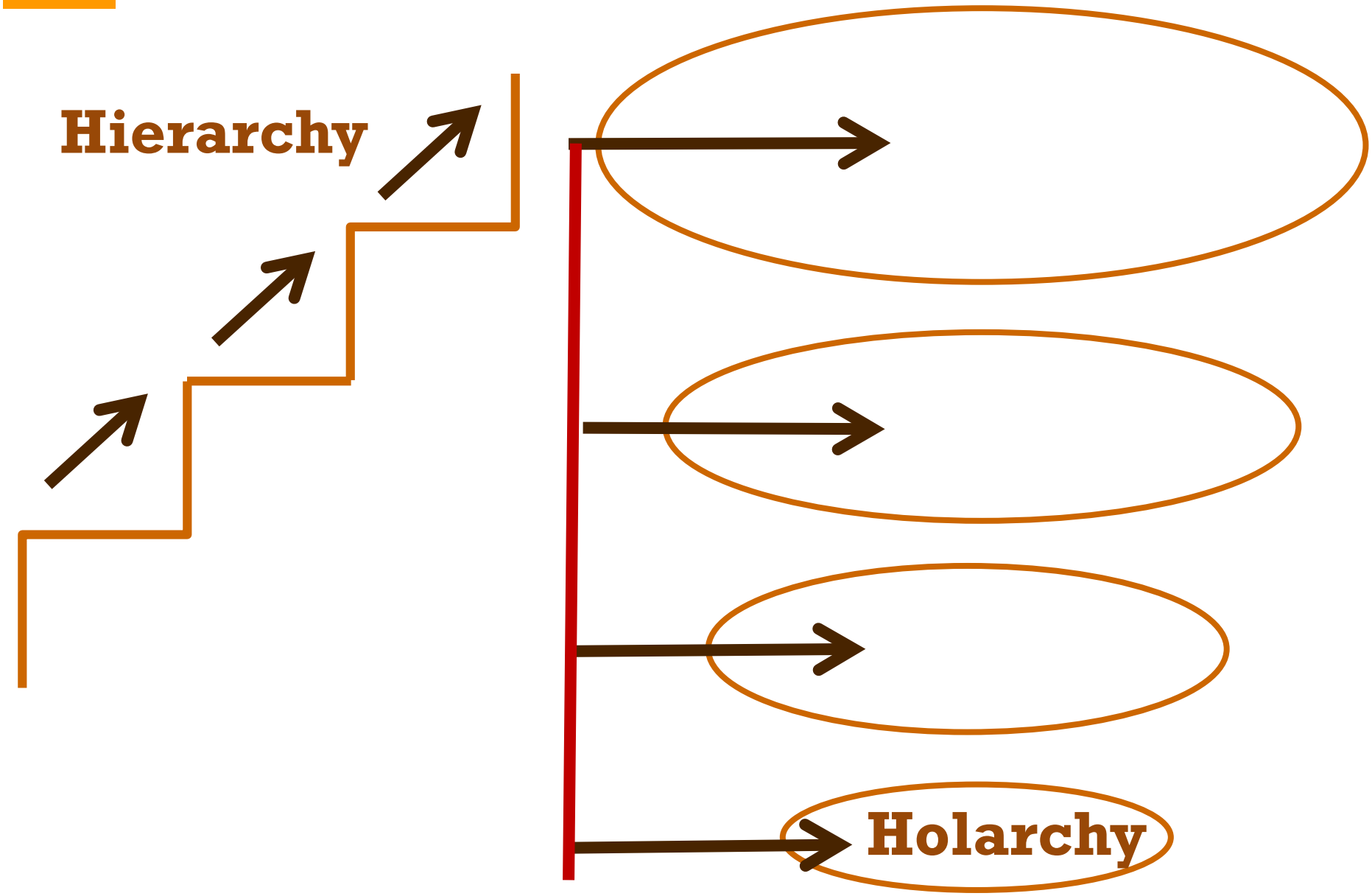


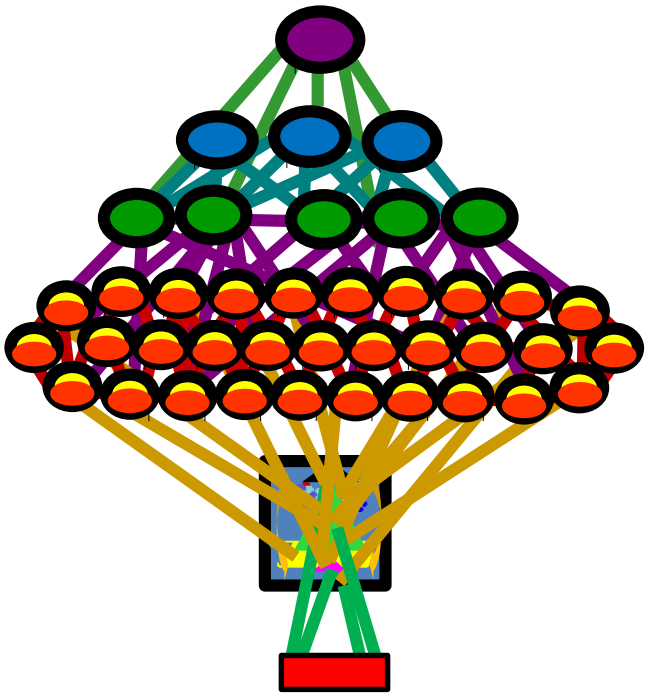
Key Concept



Executive Functions develop Holarchically across levels rather than Hierarchically

Holarchy vs Hierarchy

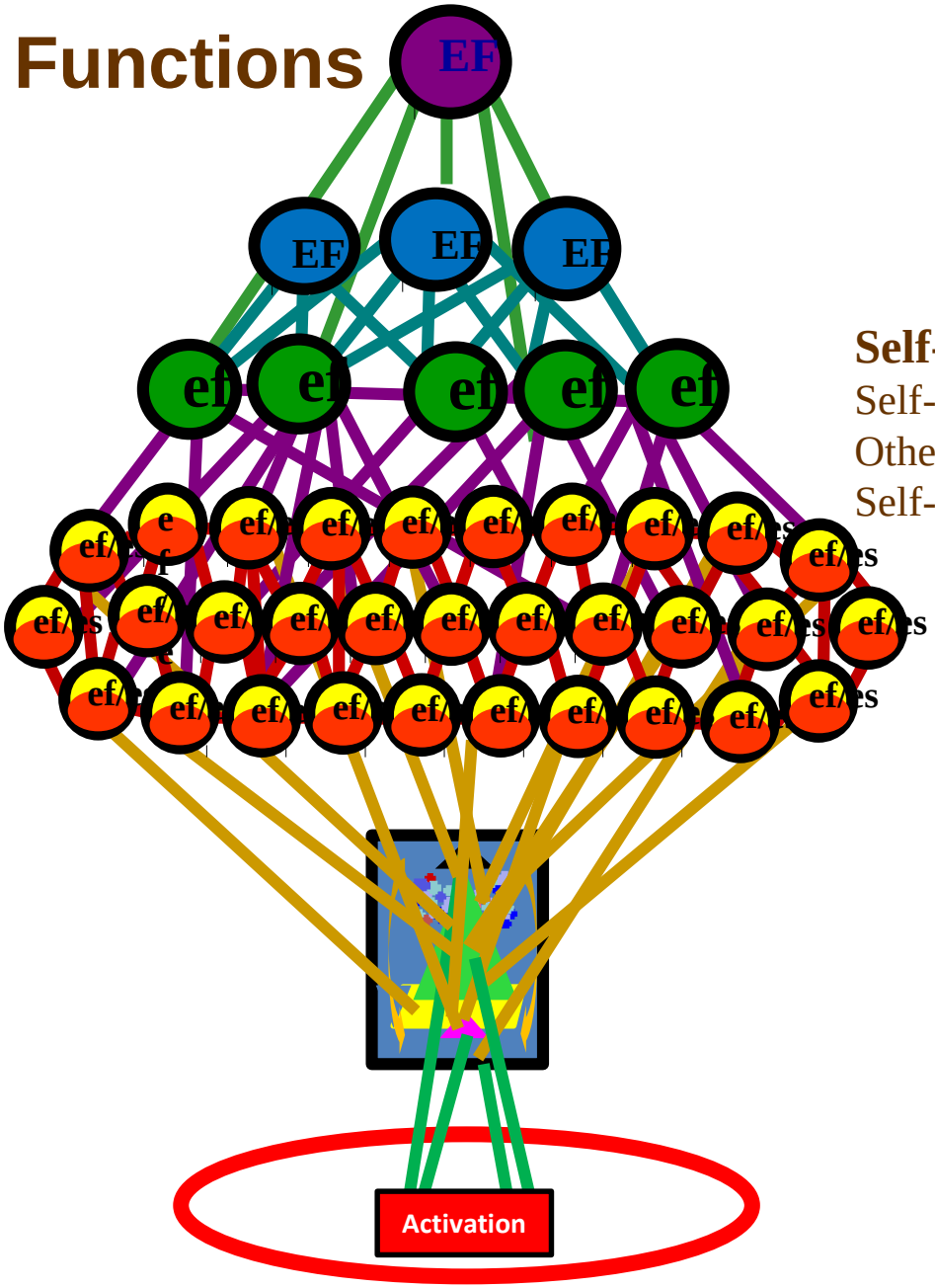




Key Concept

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

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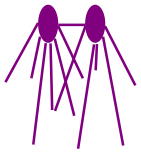
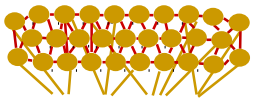
Other-Awareness
Self-Analysis



Self-Determination

Goal setting
Long-range Planning & Foresight

Self-Regulation



Perceive	Monitor	Plan
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Interrupt	Generate	Hold
Flexible	Associate	Manipulate
Shift	Organize	Store
Modulate	Prioritize	Retrieve

Self-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

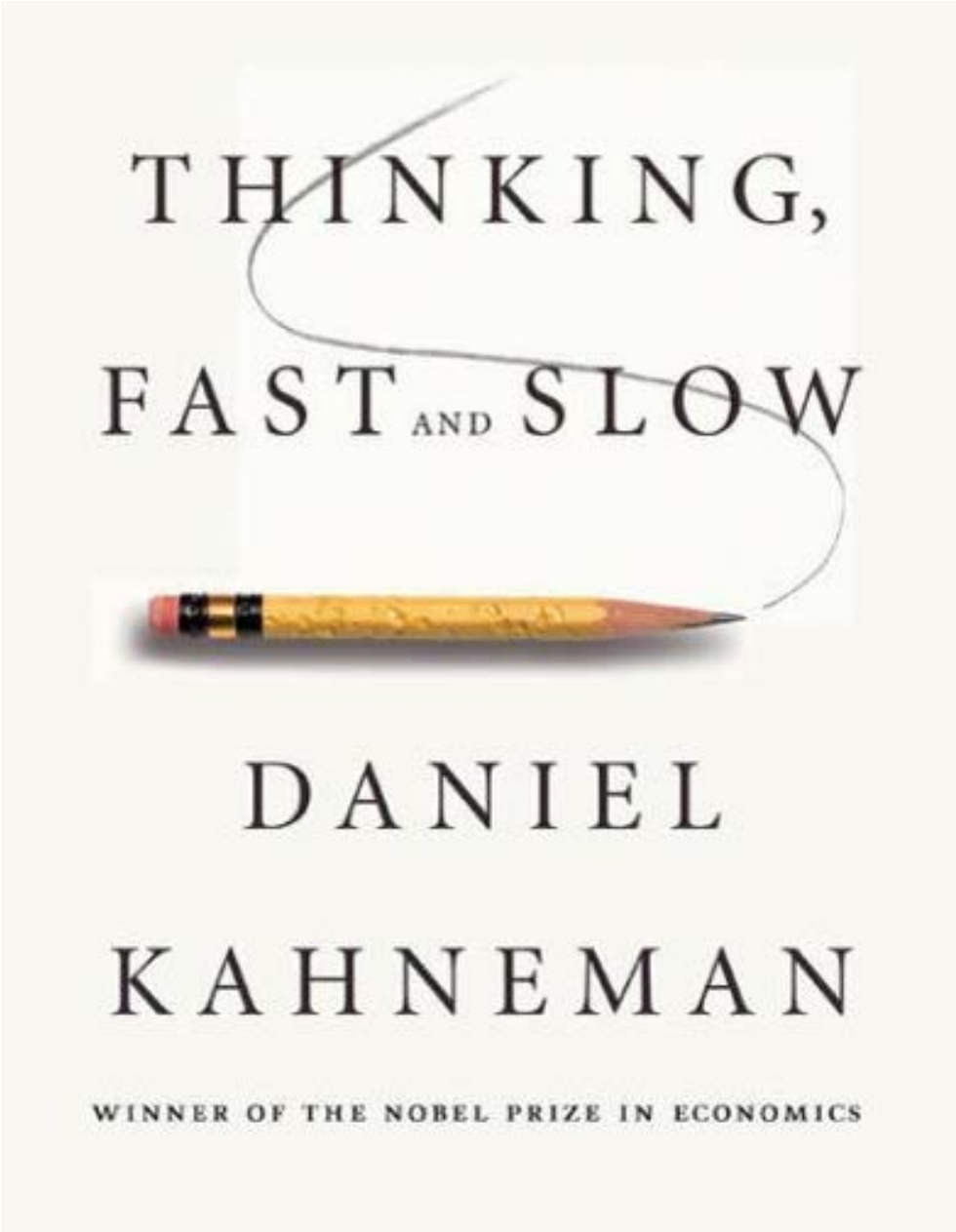
Self Activation Interventions

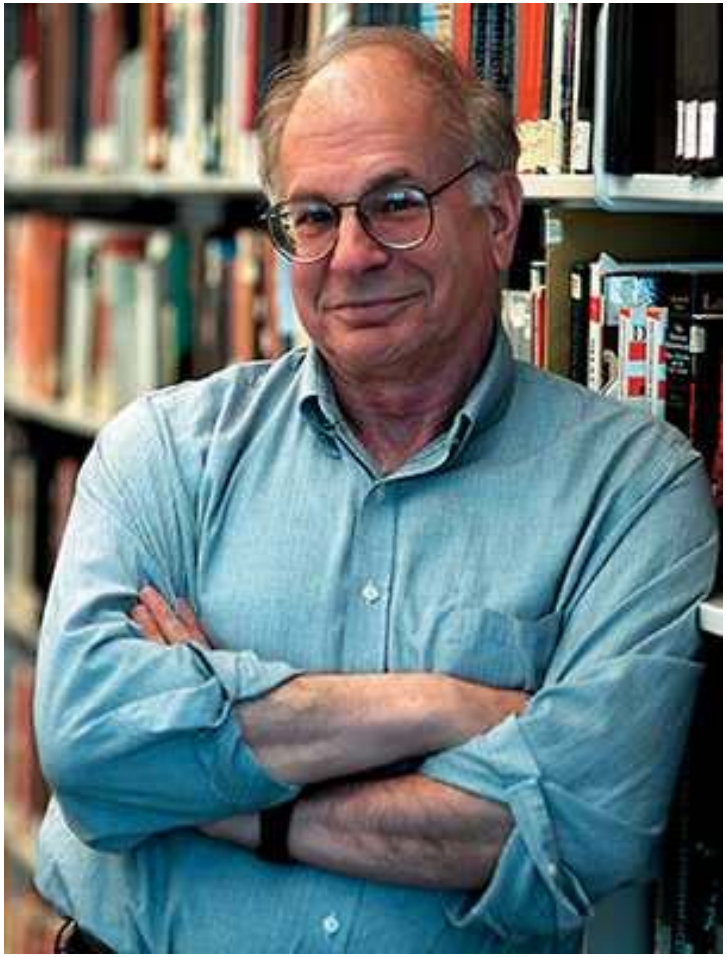
- How do you take control of a brain whose control center is not awake?

Self-Activation

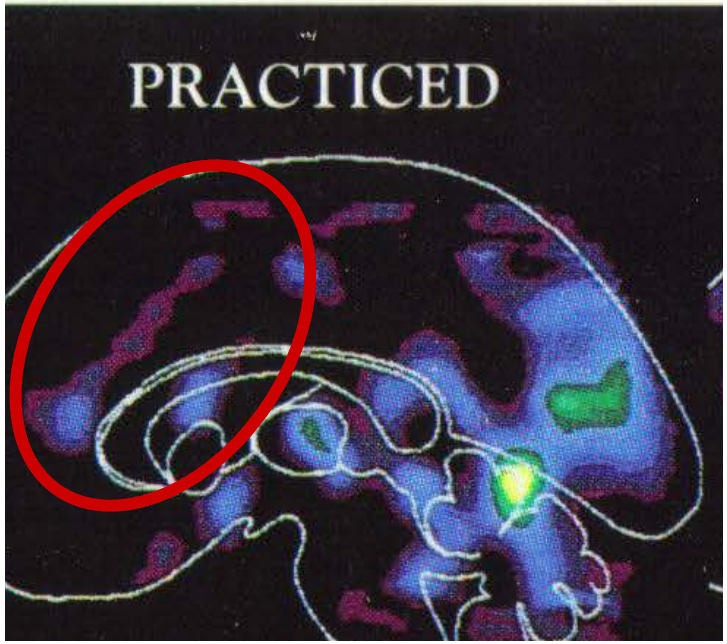
Executive Functions and Language

- 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

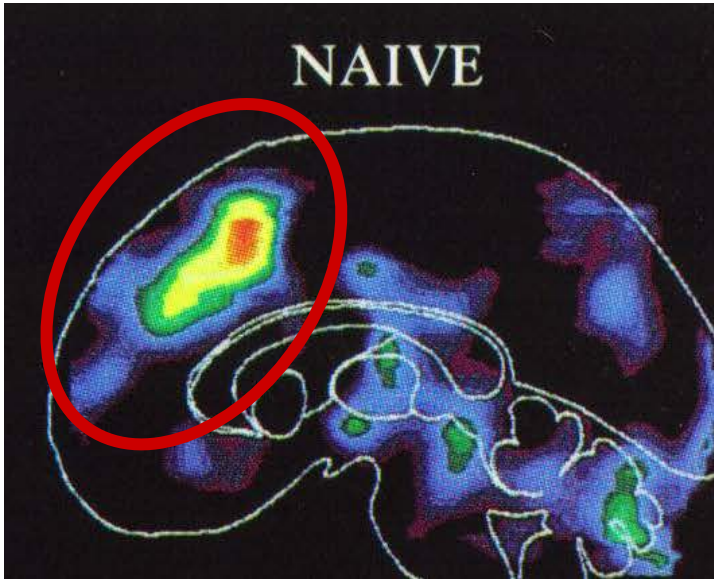

THINKING,
FAST AND SLOW
DANIEL
KAHNEMAN
WINNER OF THE NOBEL PRIZE IN ECONOMICS



System 1 – Fast, effortless, automatic



System 2 – Slow, effortful, non-automatic

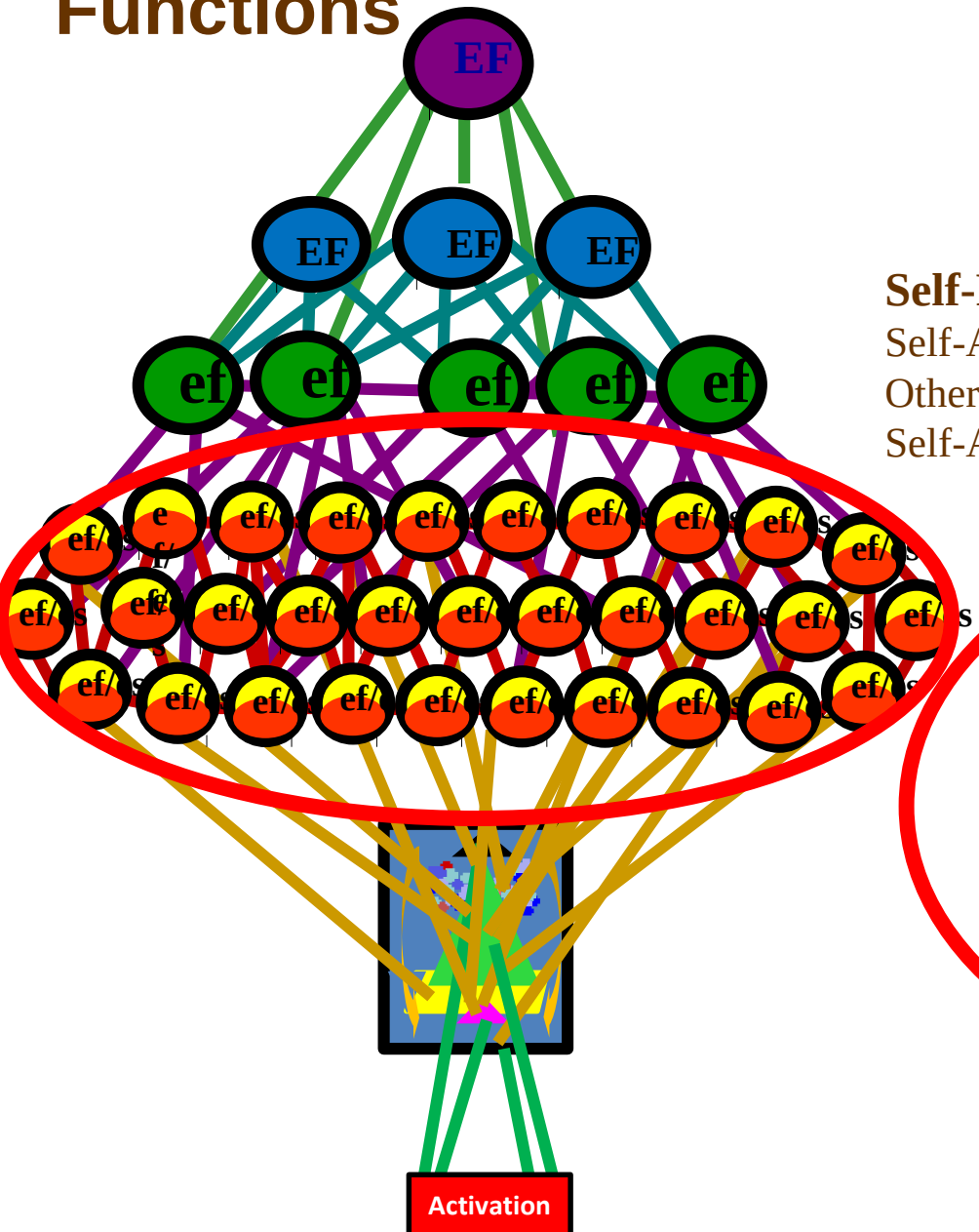


Self Activation Interventions

- 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-Activation

EF Tiers within the Holarchical Model of Executive Functions



Trans-Self Integration

Self-Generation

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

Self-Determination
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Long-range Planning & Foresight

Self-Regulation

Perceive	Monitor	Plan
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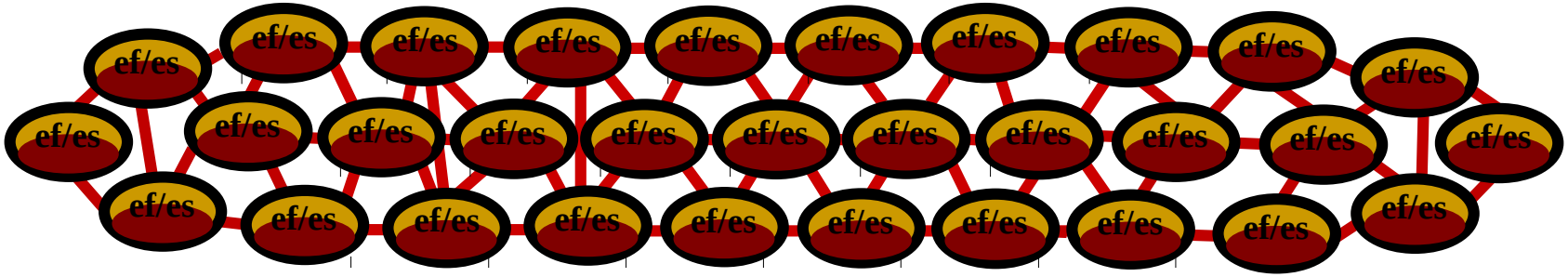
Interrupt	Generate	Hold
Flexible	Associate	Manipulate
Shift	Organize	Store
Modulate	Prioritize	Retrieve

Self-Activation

Self Regulation

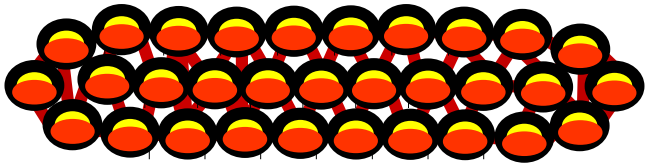
- A set of control capacities that cue and direct functioning across the domains of perception, emotion, cognition, and action
- The current model posits 33 self-regulation executive functions



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

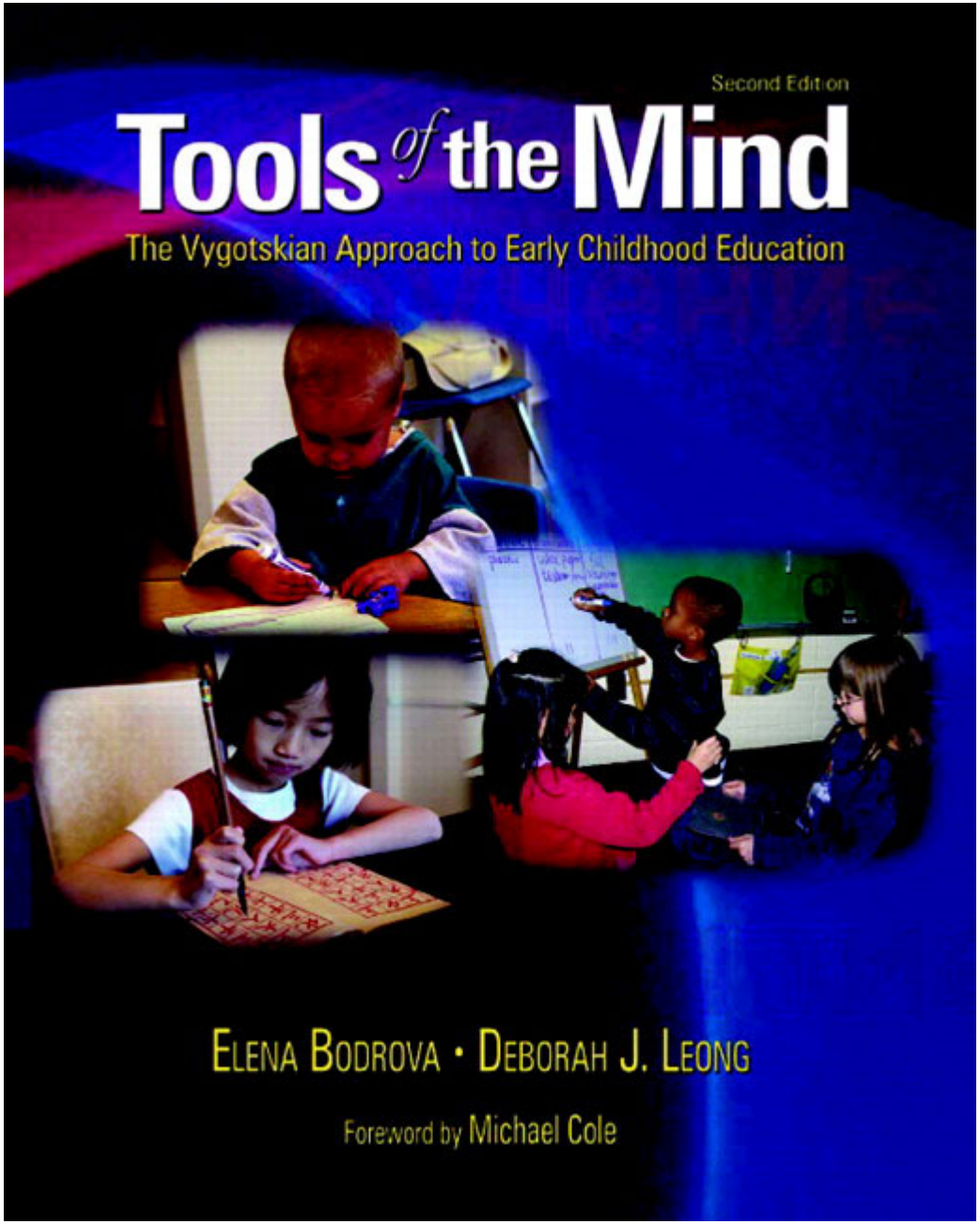
Anticipate
Gauge
Analyze
Estimate Time
Compare

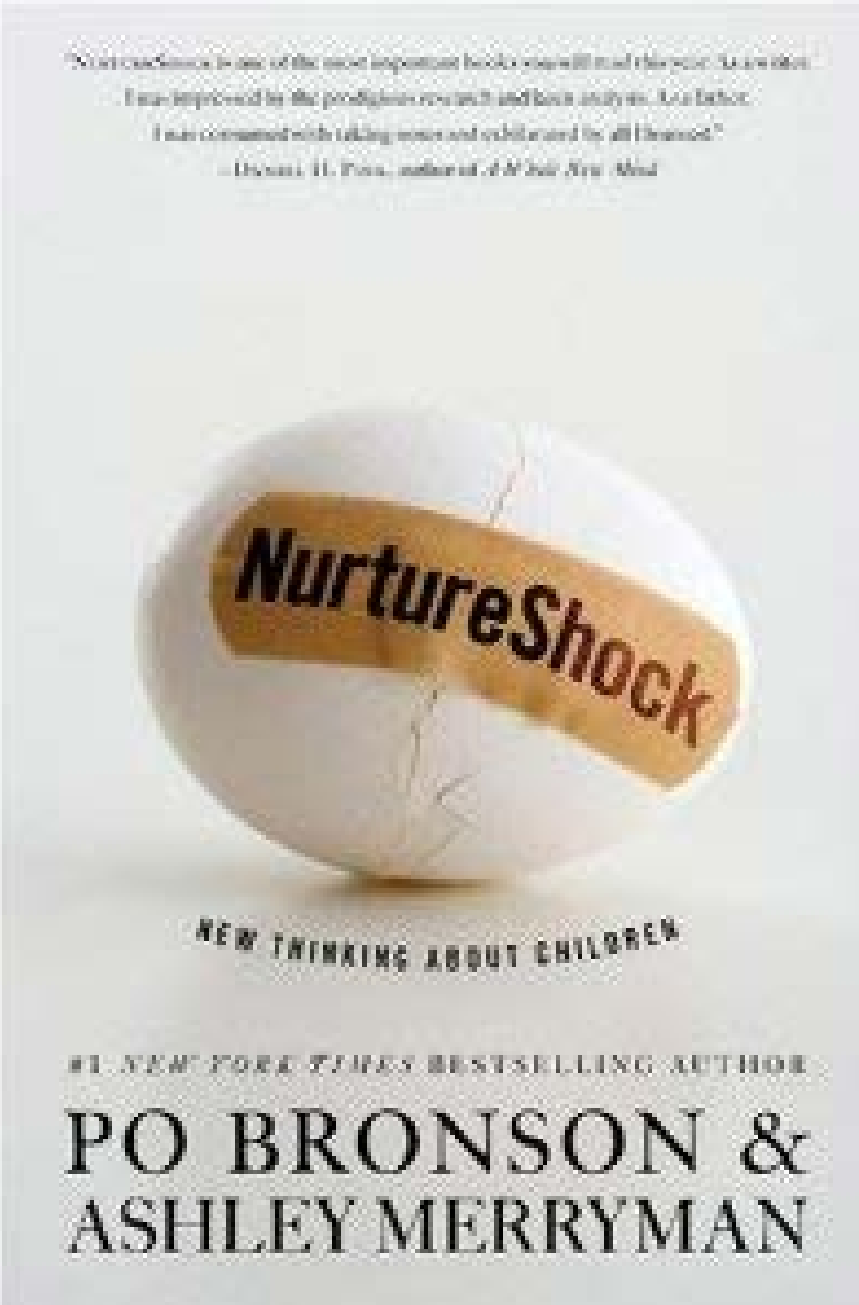
SOLUTION

Generate
Associate
Prioritize
Plan
Organize
Decide

Key Concept

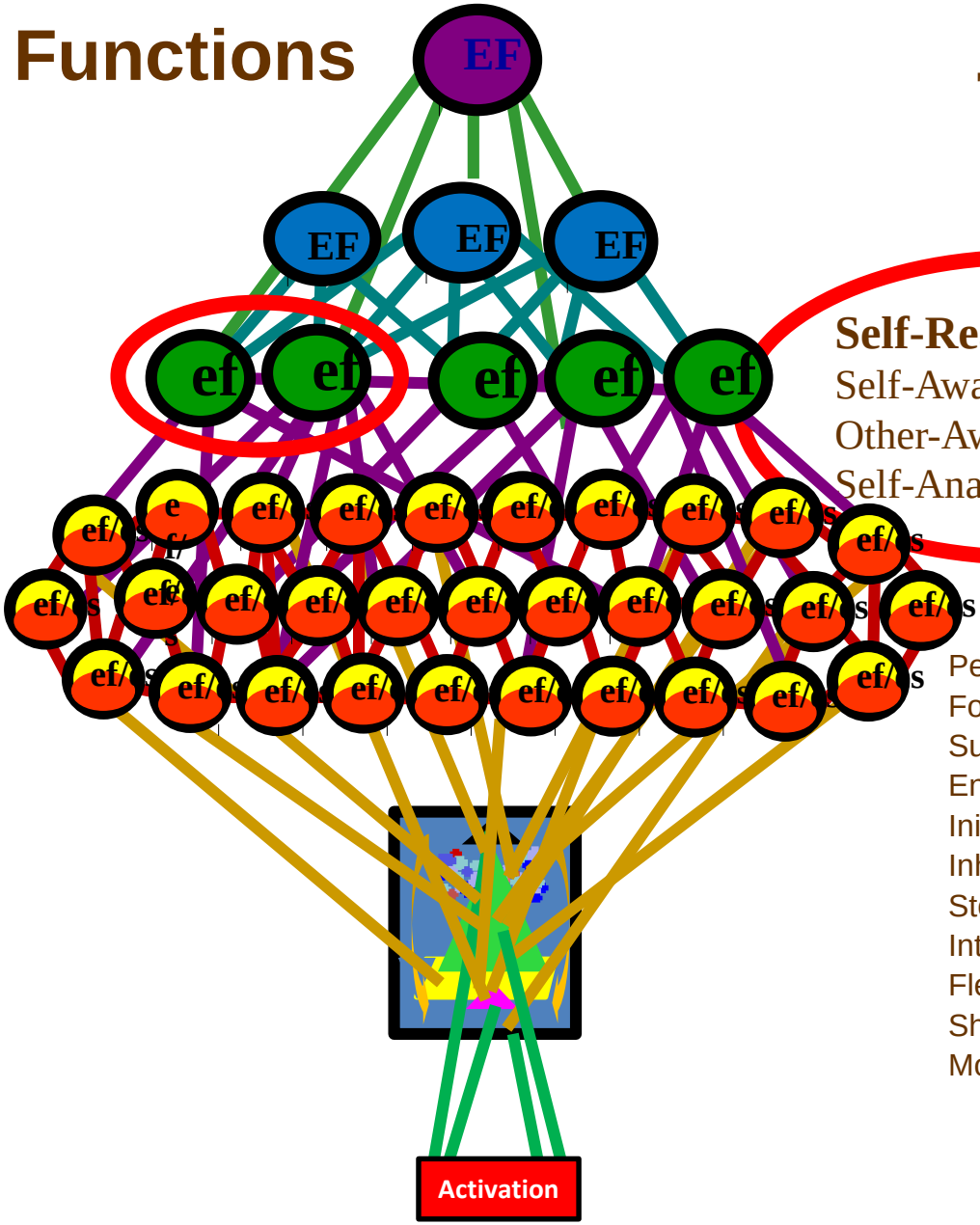
Tools of the Mind (Bodrova & Leong) is an effective preschool /kindergarten curriculum that helps young children improve self-regulation executive functions.


Second Edition
Tools of the Mind
The Vygotskian Approach to Early Childhood Education
Elena Bodrova • Deborah J. Leong
Foreword by Michael Cole



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

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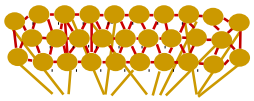
Self-Regulation



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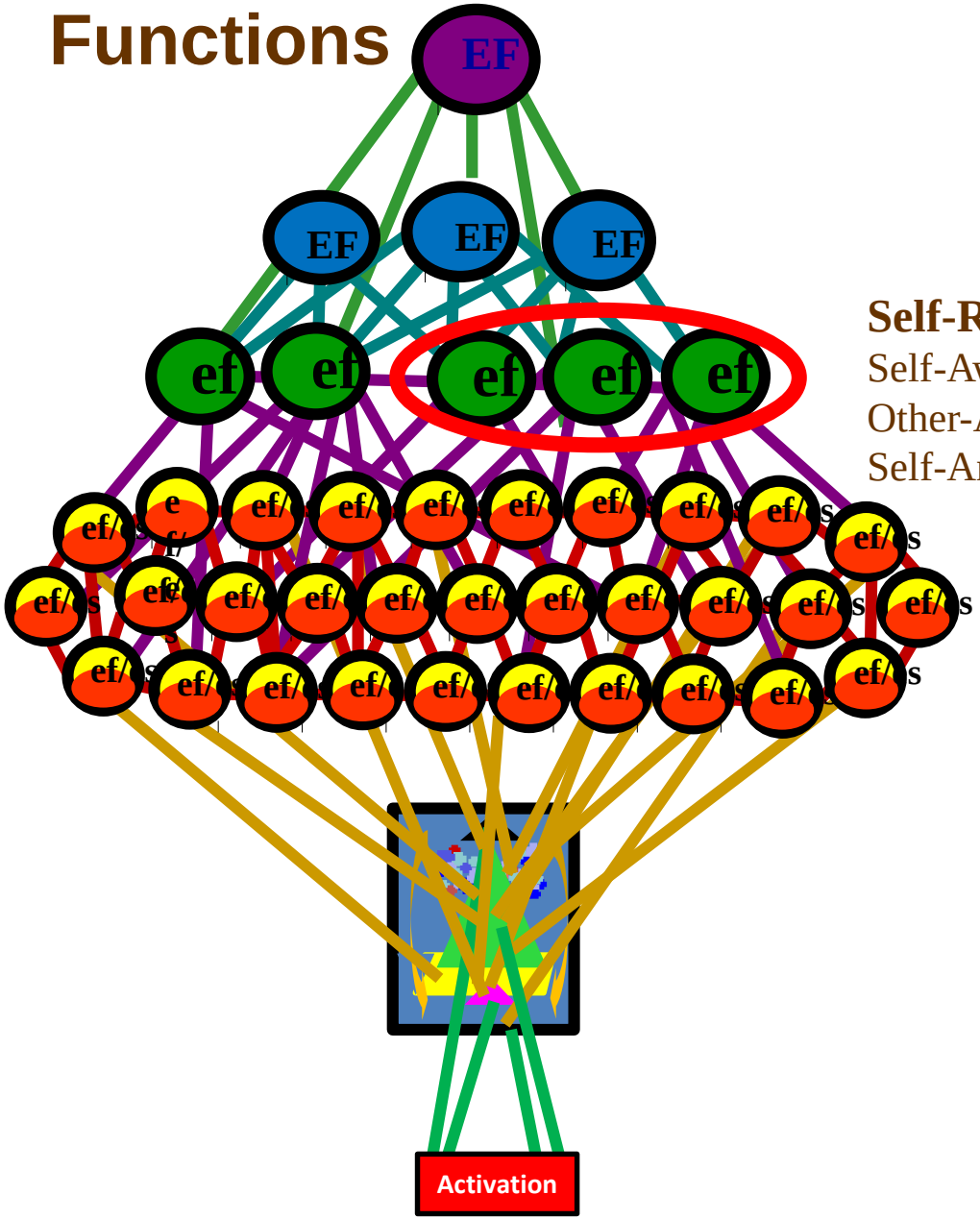
Self-Activation

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

EF Tiers within the Holarchical Model of Executive Functions



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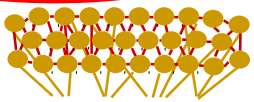

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Self-Activation

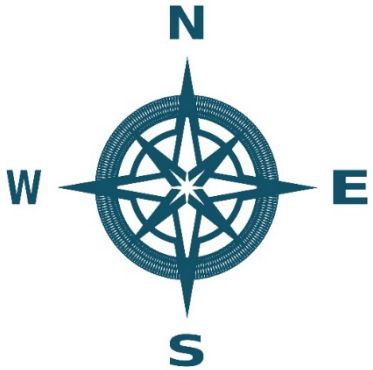
Self Determination

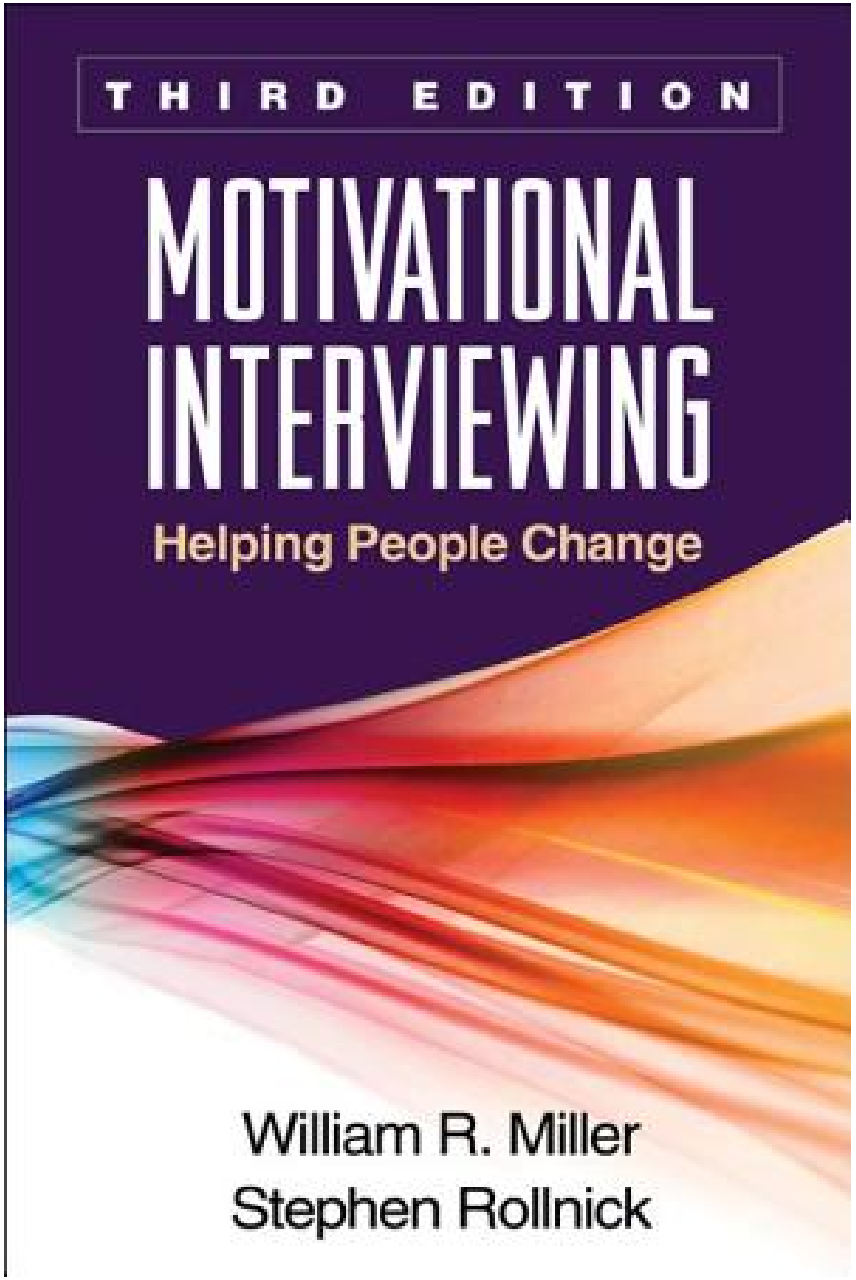
EF

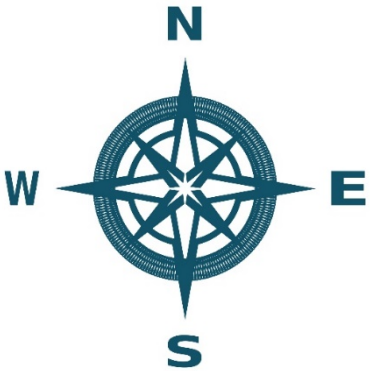
- Foresight/Long-Term Planning and Goal Generation
- Directs the use of cognitive processes to construct visions of the future and plans for action over longer periods of time. Attempts to align daily self-regulation with long-term goals.

Chapter 21
Motivational Interviewing with Adolescents and Young Adults

John S. Baer and Peggy L. Peterson



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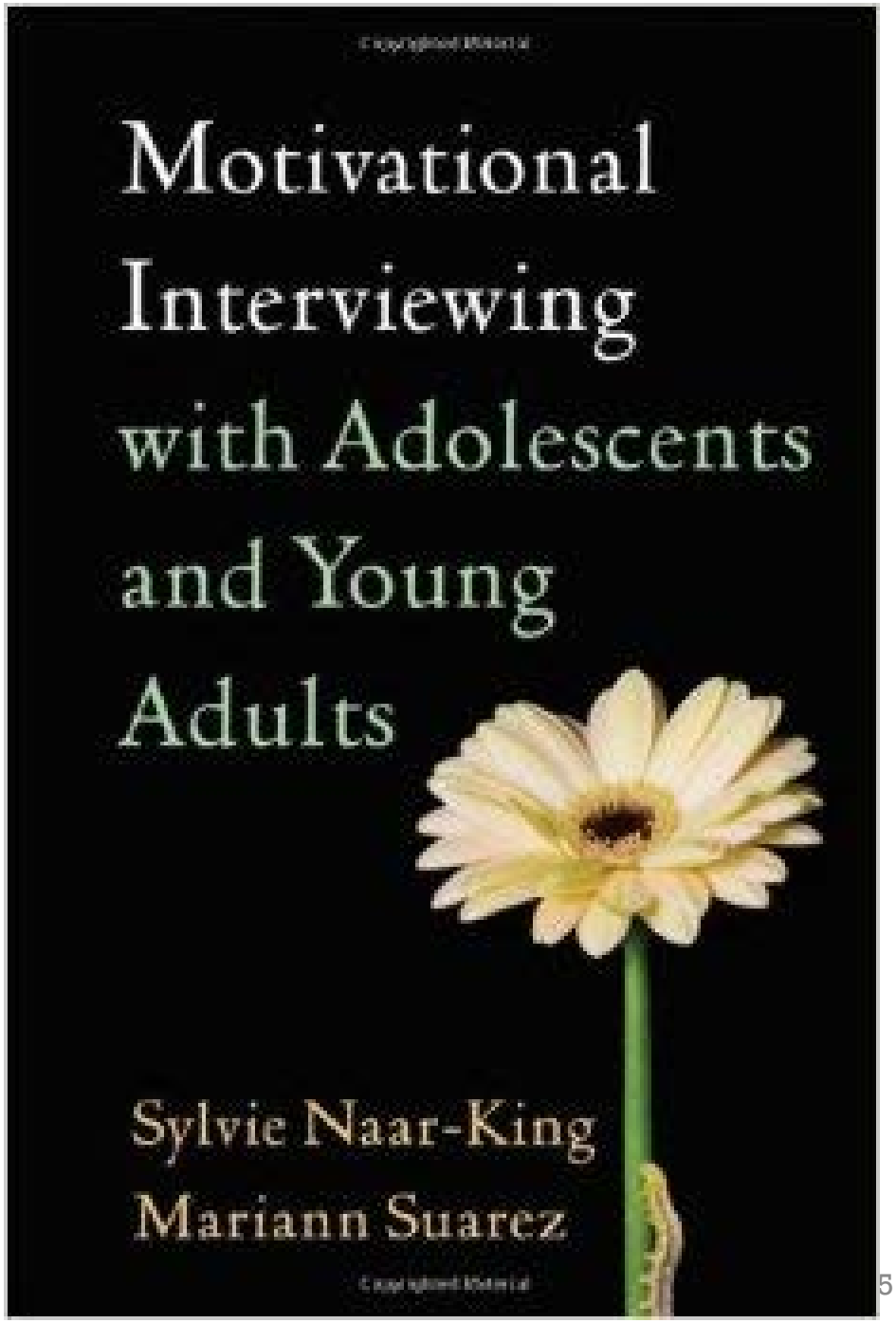
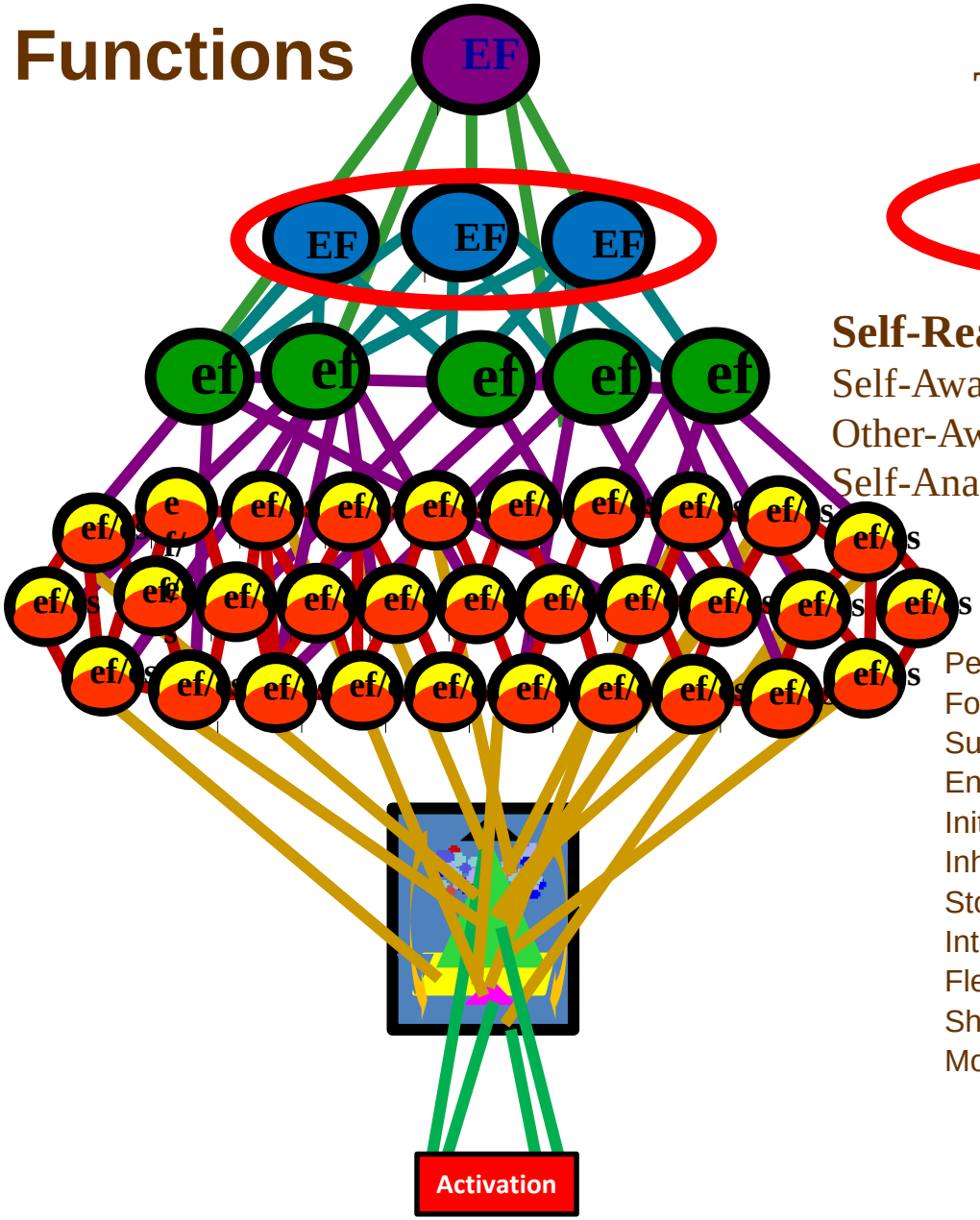

Motivational Interviewing with Adolescents and Young Adults
Sylvie Naar-King
Mariann Suarez

EF Tiers within the Holarchical Model of Executive Functions

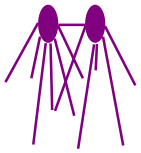


Trans-Self Integration

Self-Generation

Self-Realization

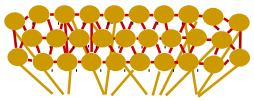
Self-Awareness
Other-Awareness
Self-Analysis



Self-Determination

Goal setting
Long-range Planning & Foresight

Self-Regulation



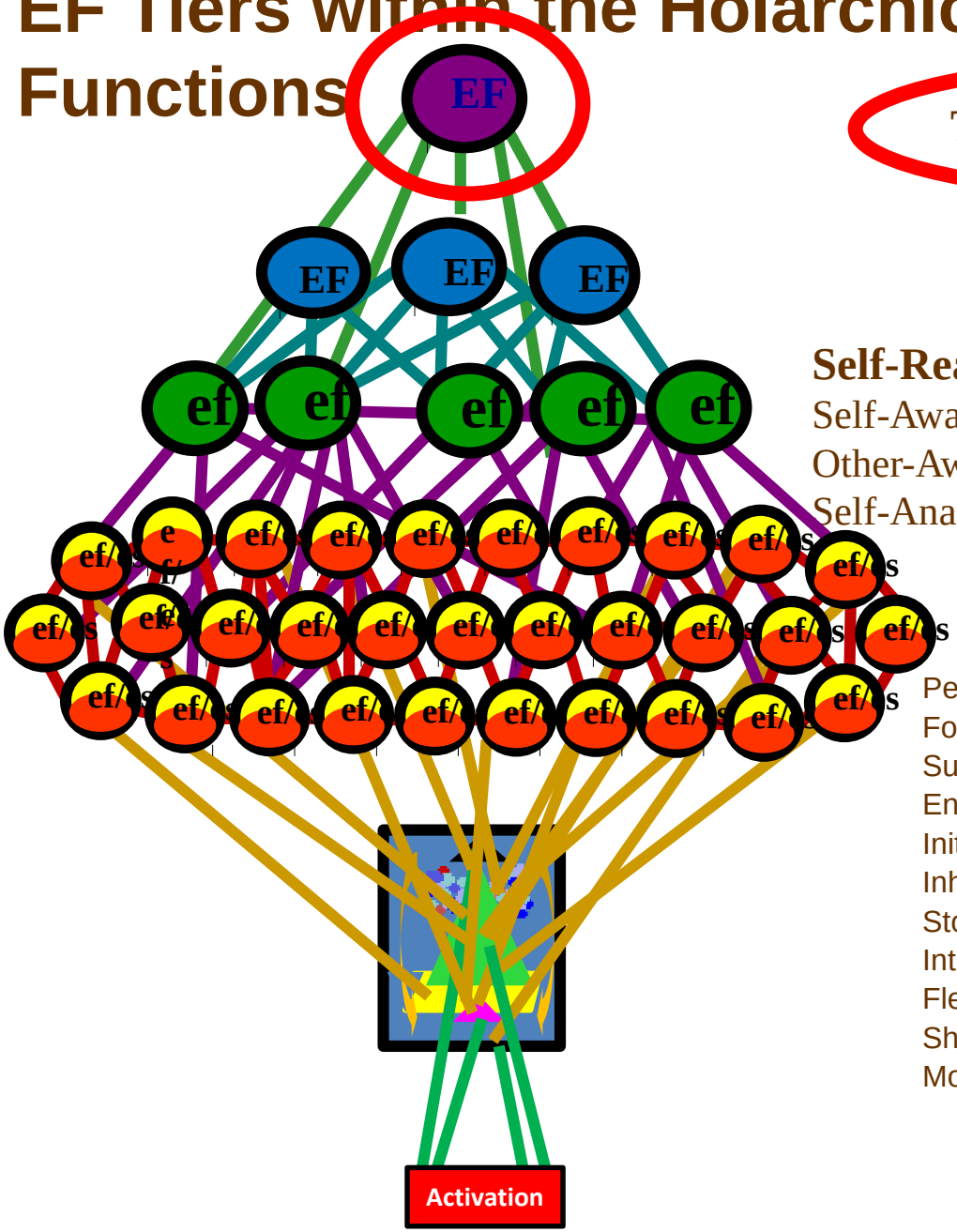
Perceive	Monitor	Plan
Focus	Correct	Evaluate/Compare
Sustain	Balance	Decide
Energize	Gauge	Sense Time
Initiate	Anticipate	Pace
Inhibit	Estimate Time	Sequence
Stop	Analyze	Execute
Interrupt	Generate	Hold
Flexible	Associate	Manipulate
Shift	Organize	Store
Modulate	Prioritize	Retrieve

Self-Activation

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

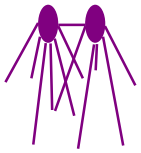


Trans-Self Integration

Self-Generation

Self-Realization

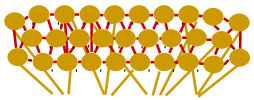
Self-Awareness
Other-Awareness
Self-Analysis



Self-Determination

Goal setting
Long-range Planning & Foresight

Self-Regulation



Perceive	Monitor	Plan
Focus	Correct	Evaluate/Compare
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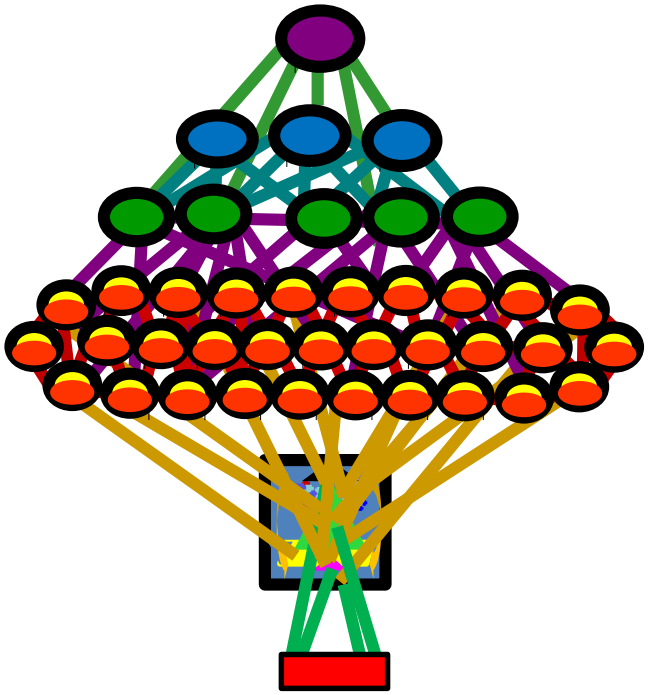
Inhibit	Estimate Time	Sequence
Stop	Analyze	Execute
Interrupt	Generate	Hold
Flexible	Associate	Manipulate
Shift	Organize	Store
Modulate	Prioritize	Retrieve

Self-Activation

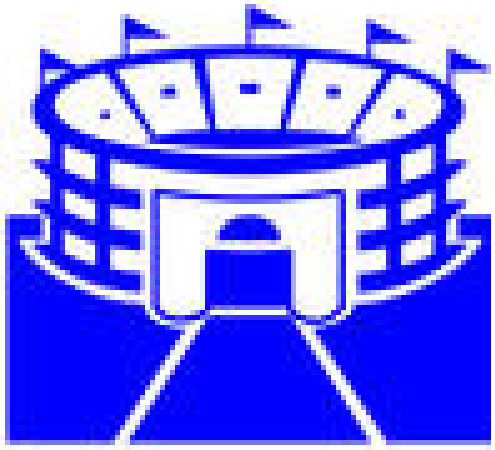
Trans-Self Integration

- 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.



Key Concept

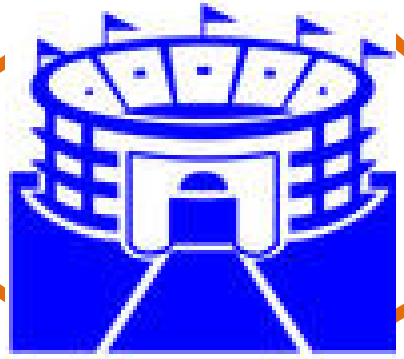
Effective use of Executive Functions can vary by Arena of Involvement as well as by Domain of Functioning.



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

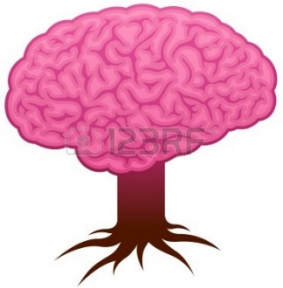
Symbol System
Control of Self in Relation to Academics (Reading, Writing, Math)

Key Concept

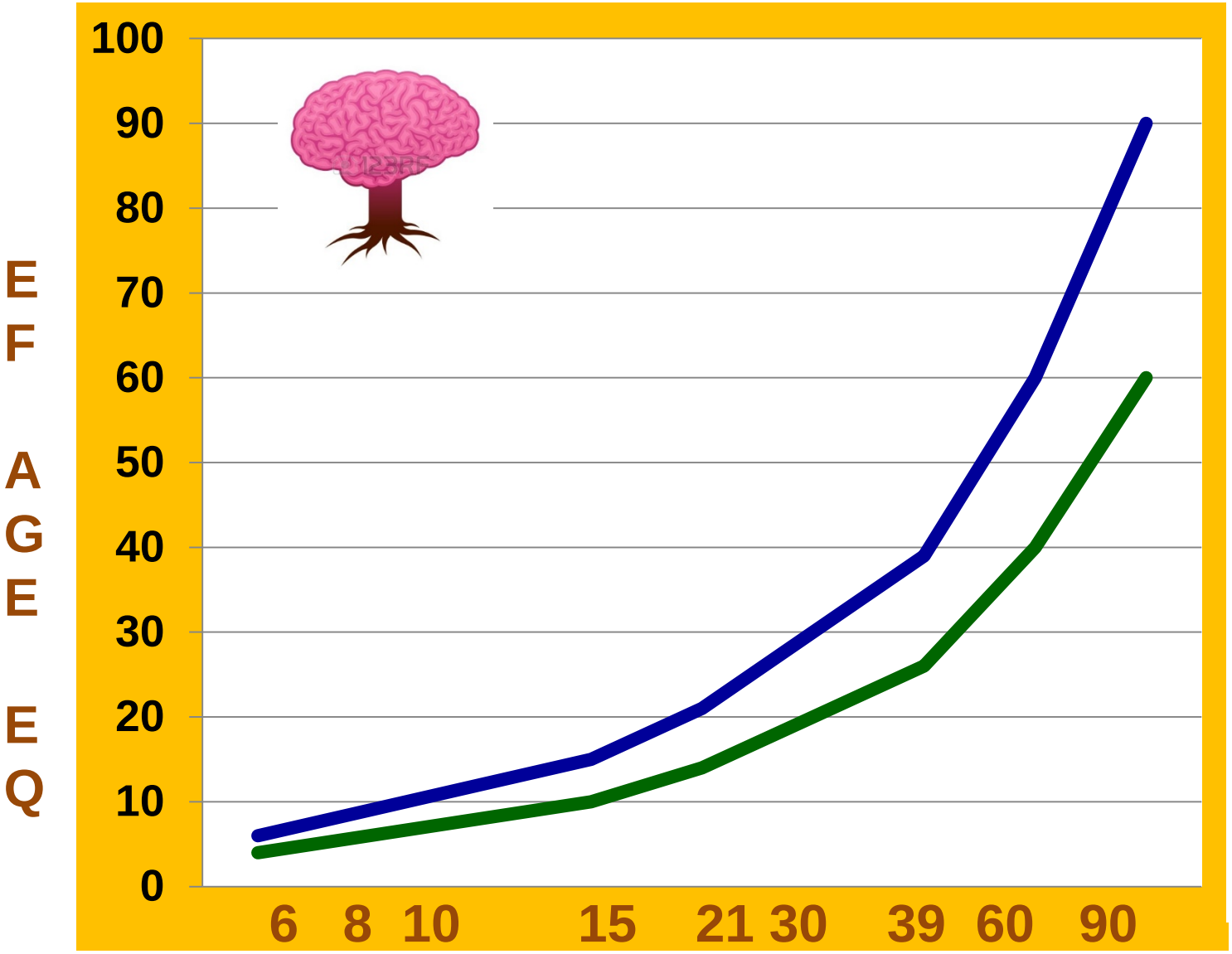
Executive Functions are developing from birth; maturational delays can cause difficulties.

Executive Function Development

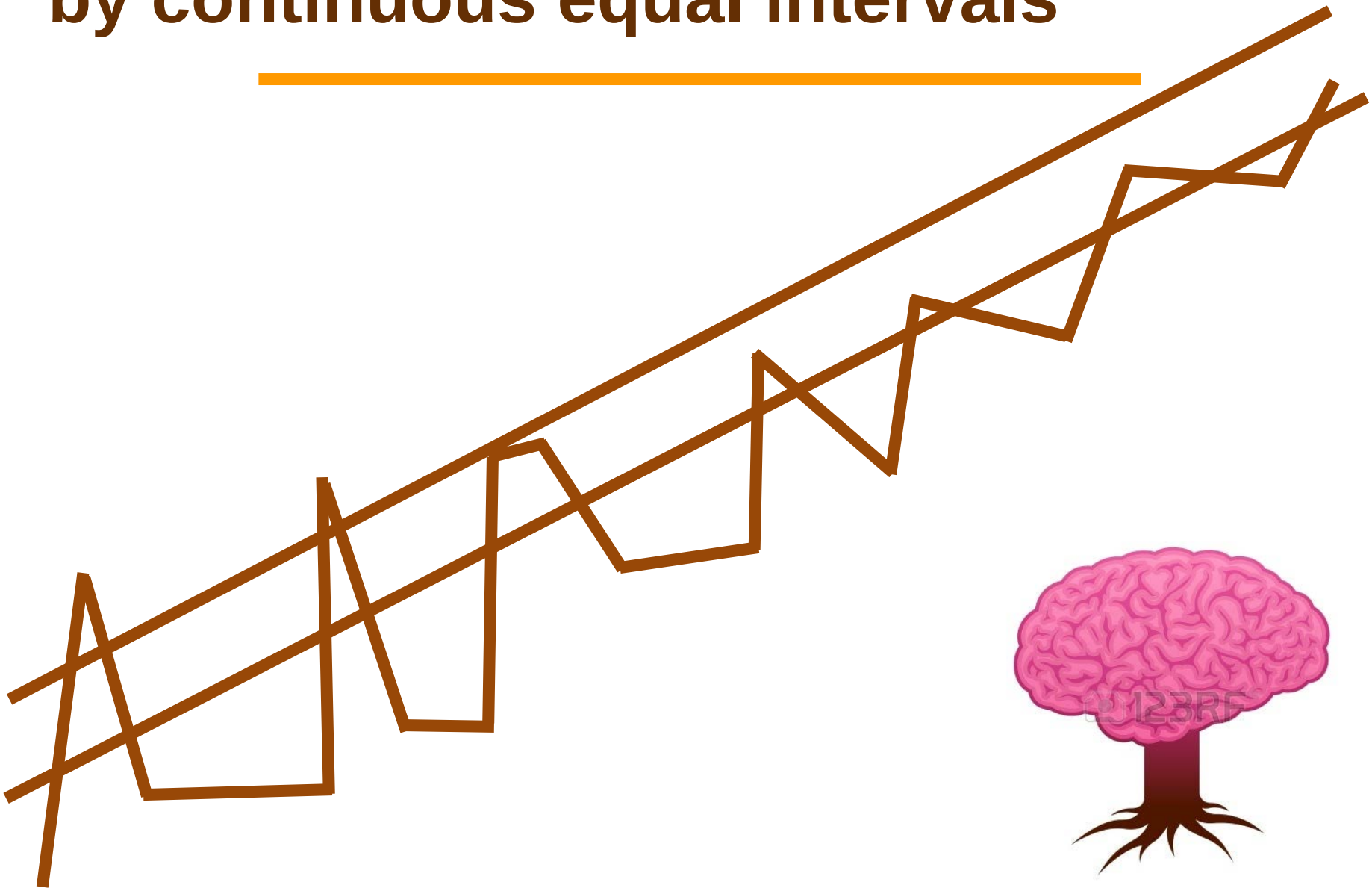
Some EF-based clinical syndromes, such as ADHD, demonstrate clear patterns of delayed developmental progression. Barkley (1998) estimates developmental delays of about 30% associated with various EF processes such as Inhibit, Manipulate, Shift, Sustain, Time Monitor, Correct.



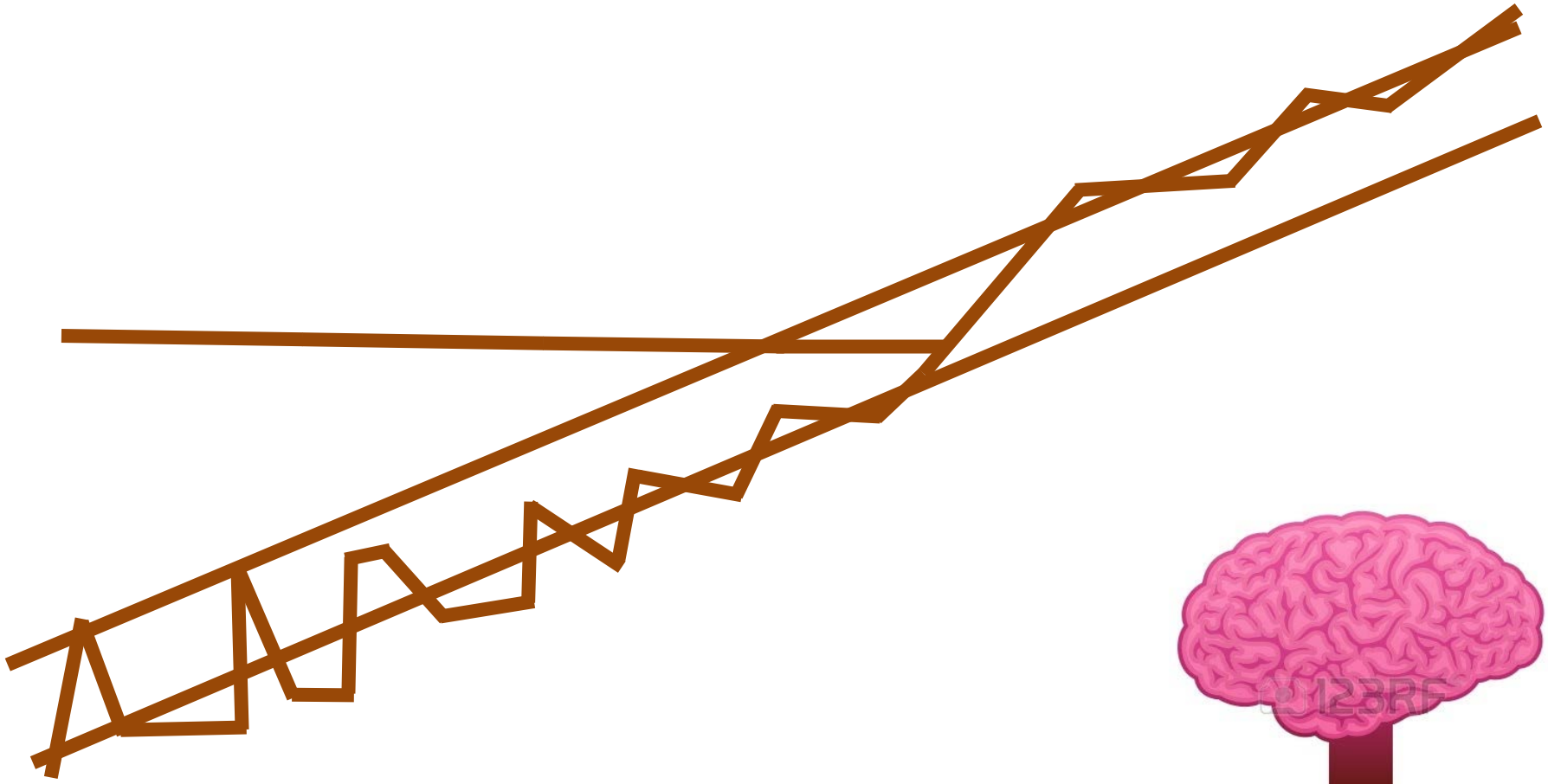
Developmental Progression with a 30% Delay



EF Development does not progress by continuous equal intervals



EF Development does not progress by continuous equal intervals



DAILY PROGRESS BY CLASS

	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
ENGAGEMENT	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	25-Feb	26-Feb	27-Feb	28-Feb	1-Mar
Math	3	3	3	3	2	0	2	0	0	1	1	0	3			0	3	2	2	3
Science	3			3	3	0	2	0	0	0		0	3			0	2	2	0	2
Social Studies	3	3	3	3	2	0	3	2	3	3	3	3	2			3		1		
English	3	2	3	3	0	3	3	0	3	0	0	0	3				3	3	3	3
Reading	3	3	3	3	0	0	3	3	3	0	3	3	3				3	3	3	3
Math Facts		0	3	3	3	0	3	0	3	0	3					3	0	3	3	3

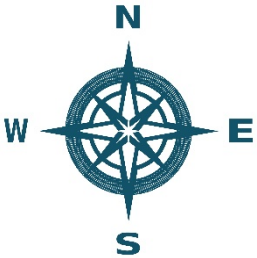
	WEEK 5					WEEK 6					WEEEK 7					WEEK 8				
ENGAGEMENT	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-M
Math	3	3	3	1	3	3		2		1	0	0	1	0	3	1	0			
Science	0		2	1	3	3				0	0	0	0	0	3	1	3			
Social Studies	3	3	2	1	3	3				3	3	3	3	3	3	3				
English	2	2	3	1	3			3		3	3	3	0	3	3	3		3		
Reading		3	3	2	3			3		3	3	3	3	3	3	3	3	3		
Math Facts	0	3	0	3	3	3		3		3	3	3		3	0	3		3		

	WEEK 9					WEEK 10					WEEK 11					WEEK 12				
ENGAGEMENT	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	29-Apr	30-Apr	1-May	2-May	3-May
Math		2	2			3	0	0	3		0		0				3	0	0	3
Science		3	3			3	0	0	0	3	3		3				3	2	2	
Social Studies		3				3	1	3	3	3	3		3				1	2	2	0
English		3	3			2	0	1	3	3	0		3			3	0	3	3	
Reading		3	3			3	2	3	3	3	1		3			3	3	3	3	3
Math Facts		3	3			0		3	3	3	1						3	2	3	3

	WEEK 13					WEEK 14				
ENGAGEMENT	6-May	7-May	8-May	9-May	10-May	13-May	14-May	15-May	16-May	17-May
Math	0	1	0	1	2		0		1	1
Science	2	3	2	3	2	2	1		1	0
Social Studies	3	3	3	0		0			0	0
English		3	3	3	3	0	3		2	0
Reading		3	3	3	3	2	3		2	3
Math Facts		3			3					3

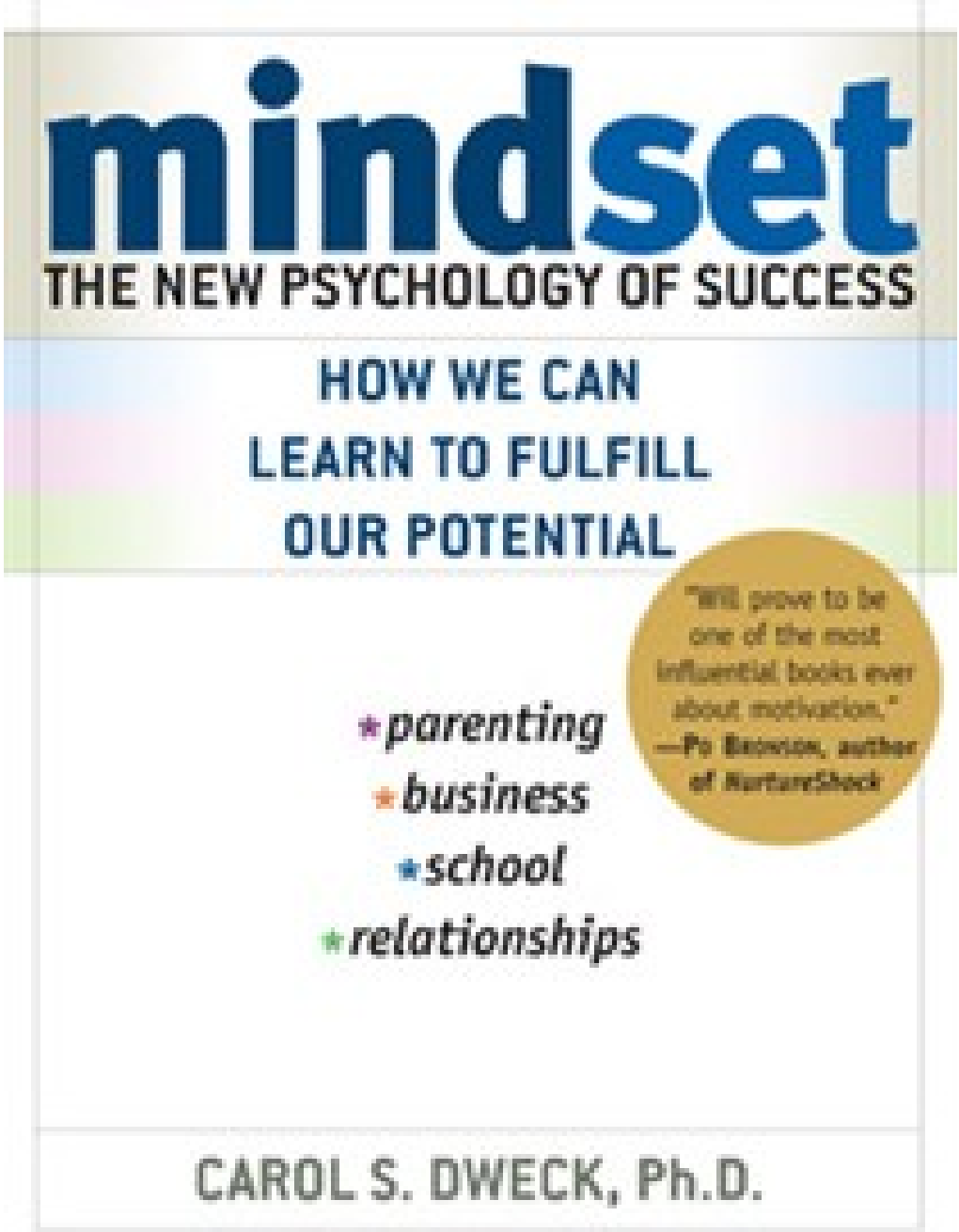
END OF YEAR SUMMARY ALL CLASSES

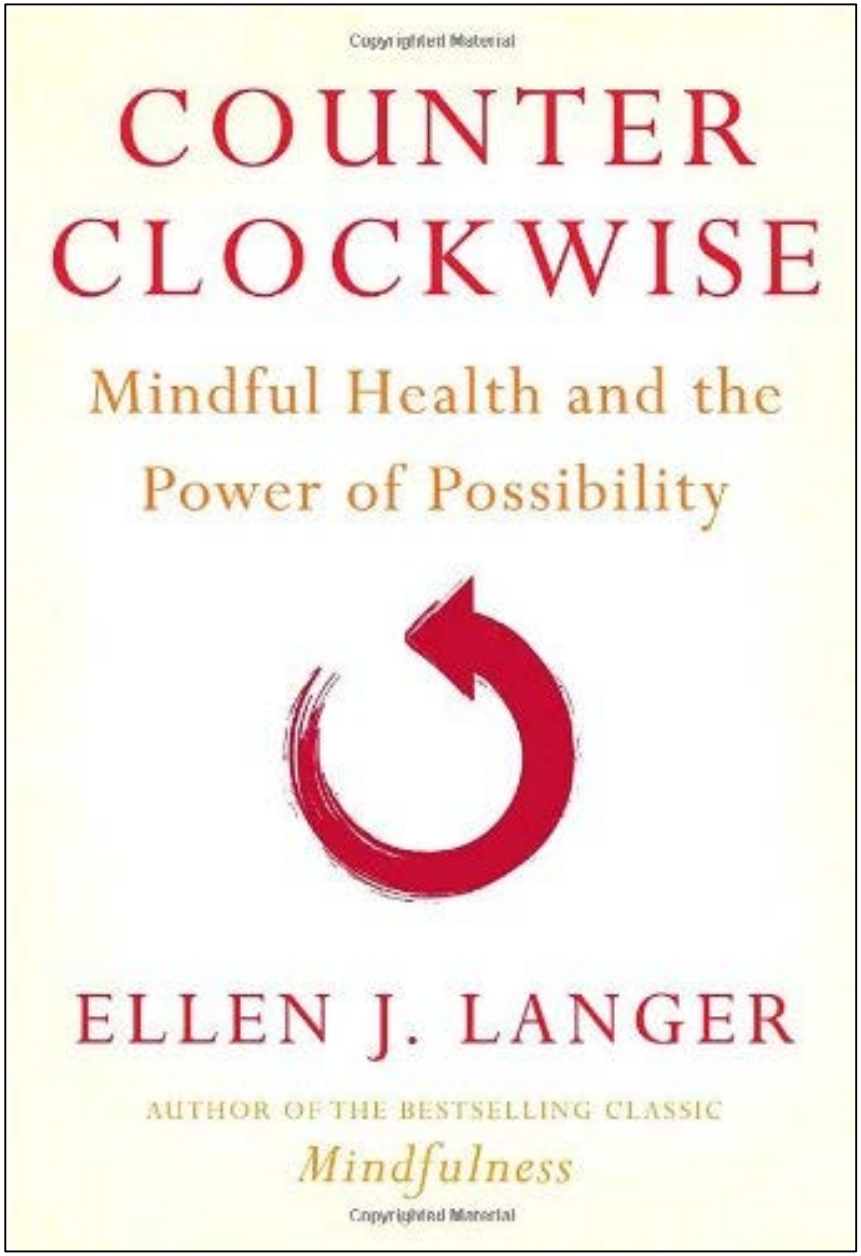
ENGAGEMENT	%
Rated 3, 2, or 1	78%
Rated 0	22%
ATTENTION	%
Rated 3, 2, or 1	78%
Rated 0	22%
WORK COMPLETION	%
Rated 3, 2, or 1	70%
Rated 0	30%



Key Concept

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.”


mindset
THE NEW PSYCHOLOGY OF SUCCESS
HOW WE CAN
LEARN TO FULFILL
OUR POTENTIAL
"Will prove to be one of the most influential books ever about motivation."
—Po Bronson, author of NurtureShock
parenting
business
school
relationships
CAROL S. DWECK, Ph.D.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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.

Langer: Reverse Zeno's Paradox

- 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.

Key Concept

Virtually all individuals who struggle with psychological disorders exhibit executive function difficulties.

Executive Functions and Clinical Diagnoses

"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*

Executive Functions and Clinical Diagnoses

- 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

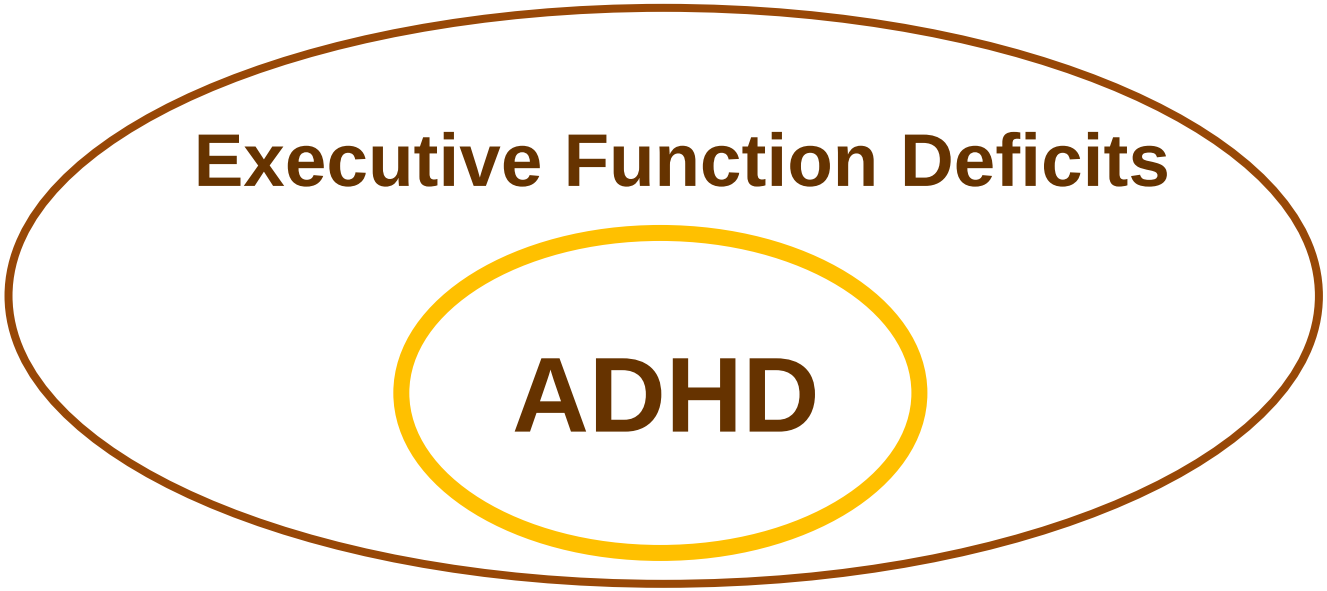
- A sampling of conditions involving EF deficits:
  - Autism Asperger's Syndrome
  - ADHD and ADD
  - Conduct Disorder
  - Oppositional Defiant Disorder
  - Depression and/or Anxiety
  - Obsessive-Compulsive Disorder
  - Fetal Alcohol Syndrome

Key Concept

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.

Different Constellations

Perceive
Energize
Shift
Monitor
Est Time
Organize
Sense Time
Hold
Initiate
Flexible
Correct
Anticipate
Analyze
Plan
Sequence
Manipulate
Stop
Associate
Evaluate
Pace
Store
Interrupt
Balance
Gauge
Generate
Decide
Execute
Retrieve

Focus **Sustain** **Modulate** **Inhibit**

Alan Age 10

Same Core

Focus **Sustain** **Modulate** **Inhibit**

Katie Age 11

Perceive
Energize
Shift
Monitor
Est Time
Organize
Sense Time
Hold
Initiate
Flexible
Correct
Anticipate
Analyze
Plan
Sequence
Manipulate
Stop
Associate
Evaluate
Pace
Store
Interrupt
Balance
Gauge
Generate
Decide
Execute
Retrieve

Different Constellations

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.

Key Concept

Producing difficulties are different from learning difficulties; producing difficulties reflect poor use of executive functions.

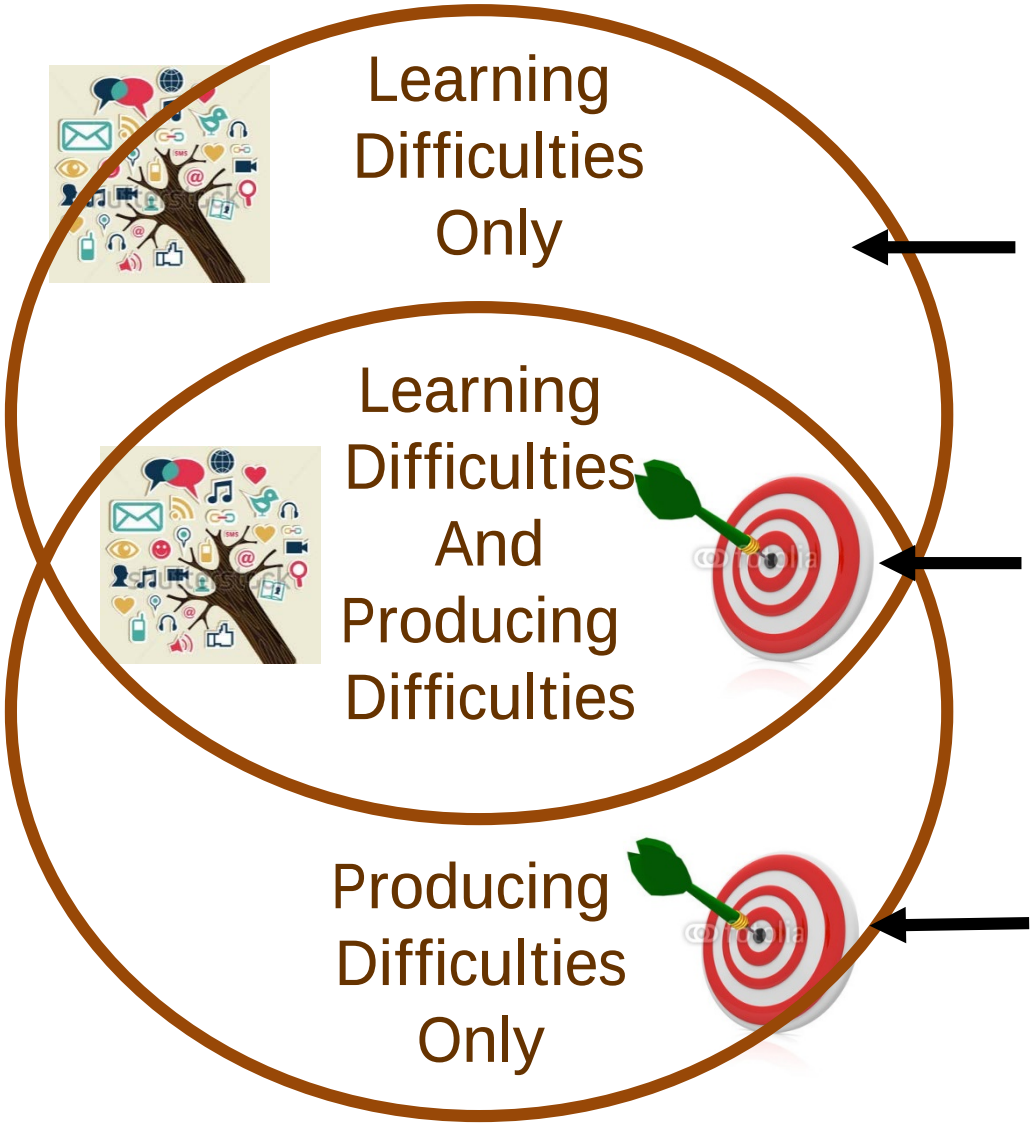
vs

Producing versus Learning

Executive Function difficulties of a severe nature (especially in the Symbol System Arena) do not result in Learning Difficulties; they result in Producing Difficulties.

vs

A General Model for Conceptualizing Learning and Producing Difficulties



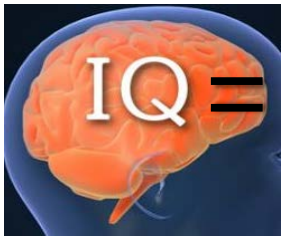
Often NOT recognized as a Learning Disability, even when severe, unless an evaluation involving process assessment is done

Recognized fairly quickly as a Learning Disability

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

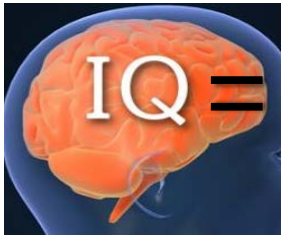


= EF?

Measuring Executive Functions with a Reasoning Task

Directions for the Wisconsin Card Sorting Test (WCST):

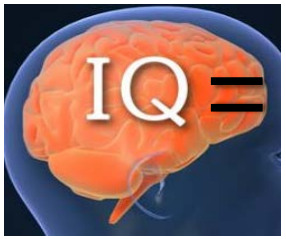
I can't tell you much about how to do this task. Which of these do you think this one goes with? I'll tell you if your answer is right or wrong.



= EF?

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.



EF Rating Inventories

The McCloskey Executive Function Scales (MEFS) assess 33 self-regulation executive functions across multiple domains of function within multiple arenas of involvement.

MEFS Rating Options

5	AA	Always or almost always does this on his or her own. Does not need to be prompted or reminded (cued) to do it.
4	F	Frequently does this on own without prompting
3	S	Seldom does this on own without being prompted, reminded, or cued to do so.
2	AP	Does this only after being prompted, reminded, or cued to do it.
1	DA	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.
0	UA	Unable to do this, even when direct assistance is provided.

Functional Behavior Assessment

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).

Functional Behavior Assessment

A → B → C

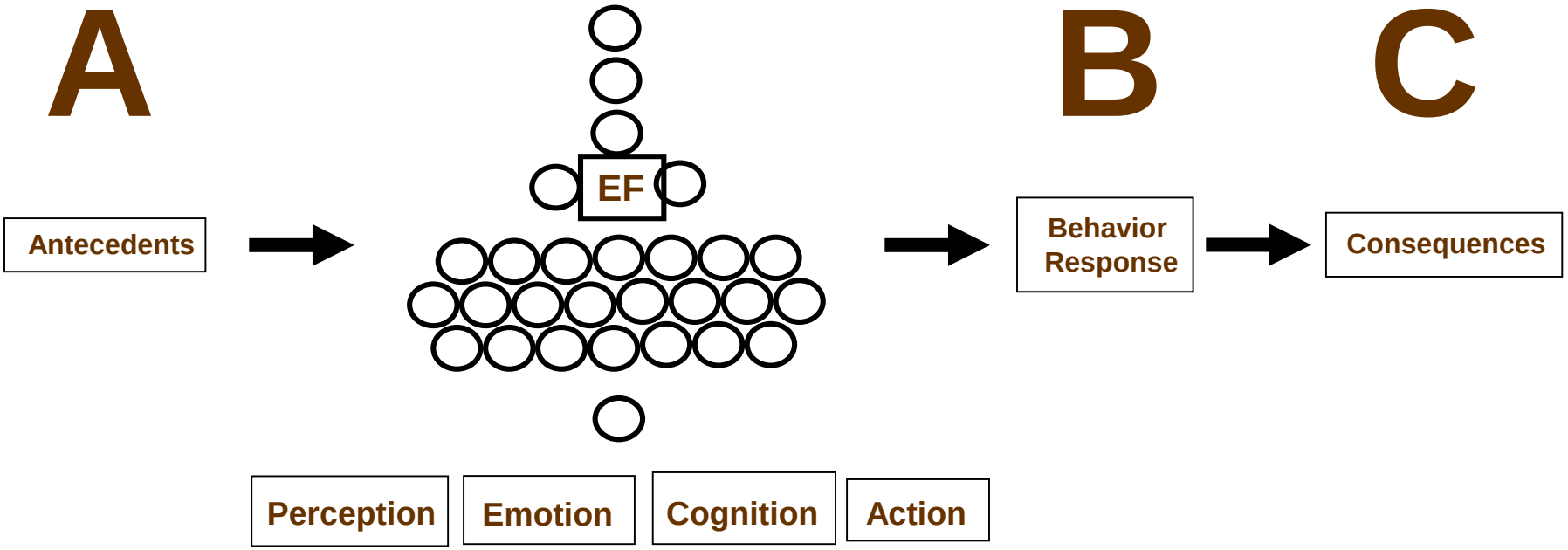
In traditional functional behavior assessments antecedents are said to TRIGGER the behavior that results in the consequences, but the reasons WHY the antecedents trigger the behavior is not really addressed.

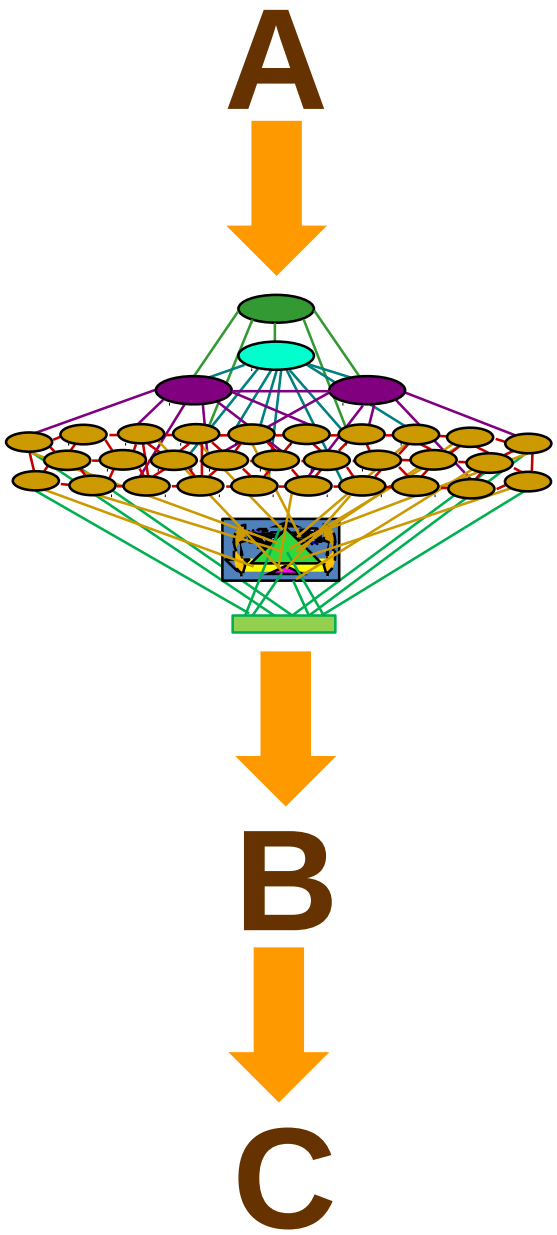
FBA: Is A-B-C Enough?

- 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.

The EF Driven FBA

Informed by knowledge of executive functions, the functional behavior assessment model can be revised as follows:





Key Concept

An EF-Driven FBA enables problems to be clearly stated in terms of perceptions, emotions, thoughts or actions that can be changed through intervention.

EF- Driven FBA

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.

Self Regulation Capacity: Focusing and sustaining attention when working independently on tasks.

Duration	Frequency						
	1 Never 0% of the time.	2 Occasionally Approximately 10% of the time.	3 Sometimes Approximately 20%-40% of the time.	4 Often Approximately 50%-70% of the time.	5 Very Often Approximately 80% of the time.	6 Almost Always Approximately 90% of the time.	7 Always 100% of the time.
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

3	**Fully engaged without frustration**	Maintained positive engagement throughout class and no frustration was apparent.
2	**Frustration managed with self cued strategy**	Frustration was apparent but was effectively managed and positive engagement occurred likely due to self-cued use of strategies.
1	**Frustration managed with teacher cue or Reset**	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.
0	**Frustration not managed**	Frustration was apparent and strategy use was cued by teacher but positive engagement did not occur and student left class.

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)
- Executive Function Skills in Children and Adolescents 2nd Edition – Dawson & Guare (2009)
- 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

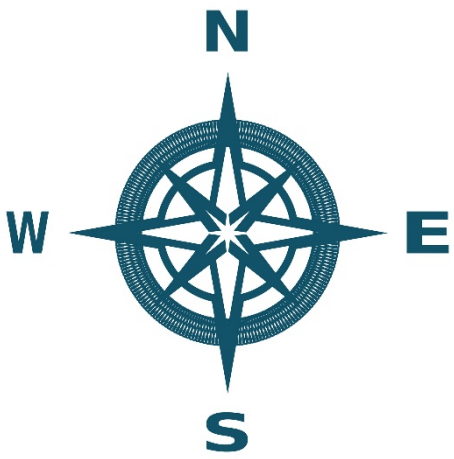
Interventions for EF Difficulties

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

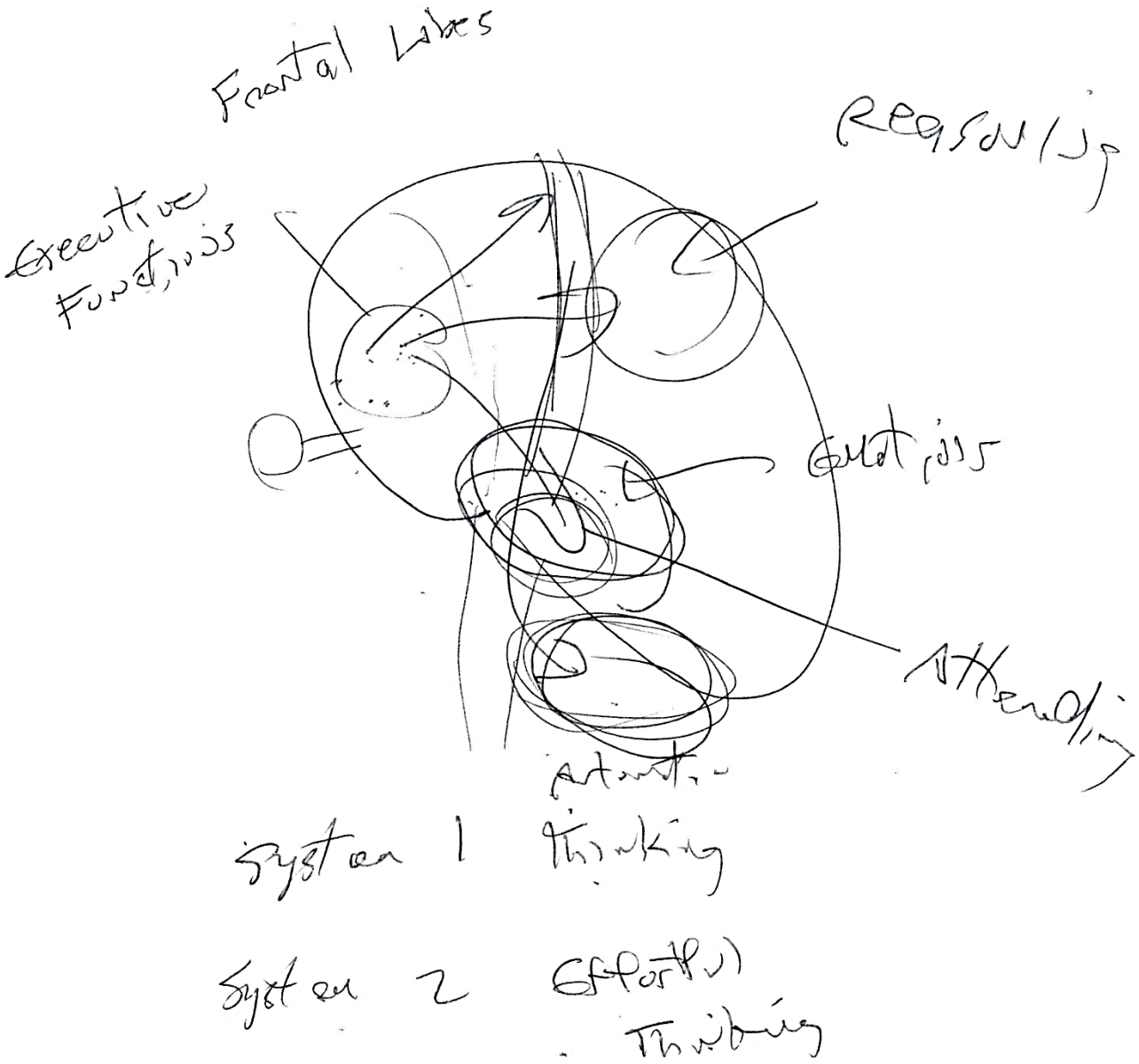
Improving students' executive functions starts with increased awareness and goal setting and progresses from external control to internal self-regulation



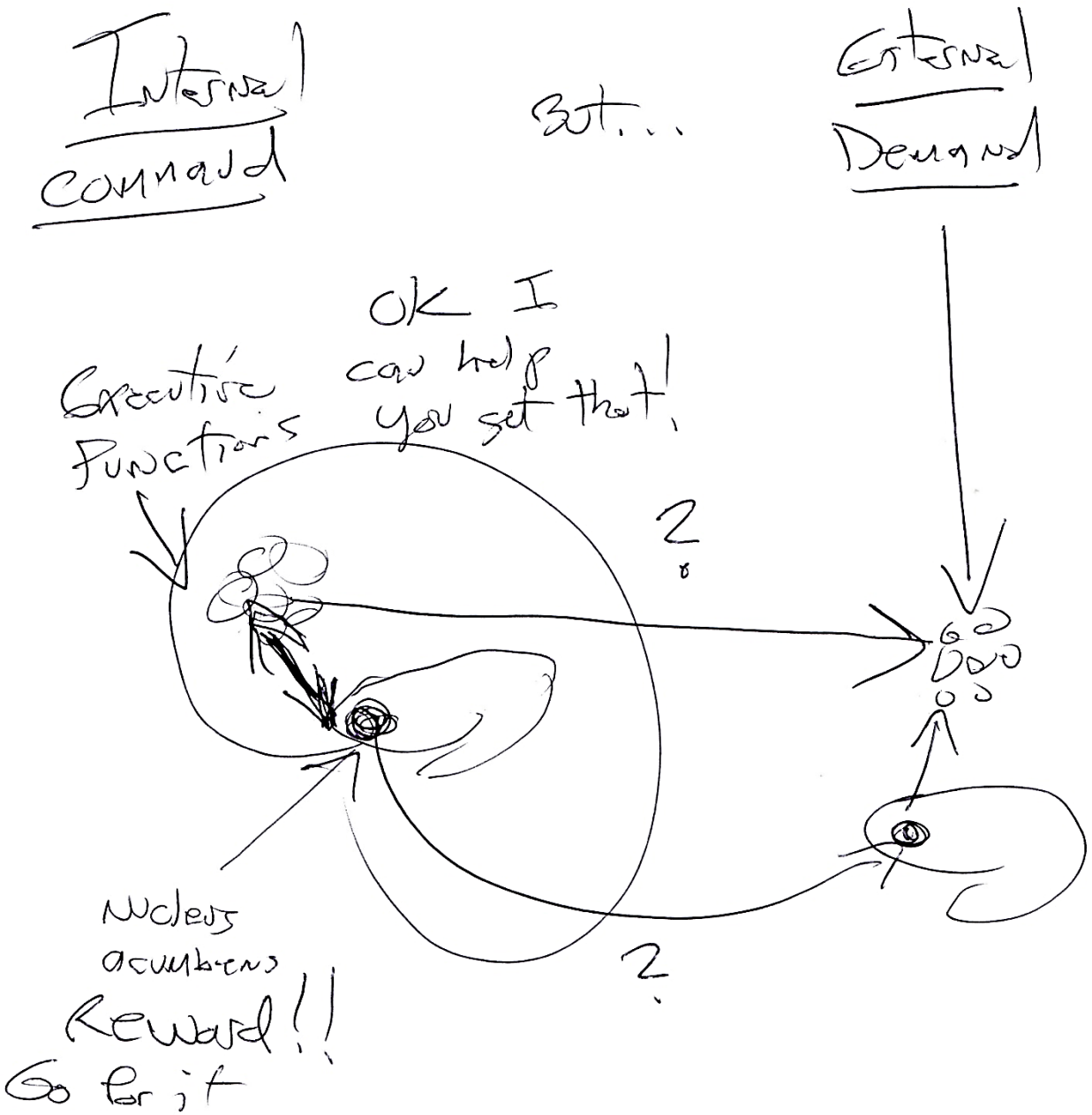
Key Concept

Orienting Strategies increase awareness of executive functions and expectations for their use and provide self-regulation goals for students.

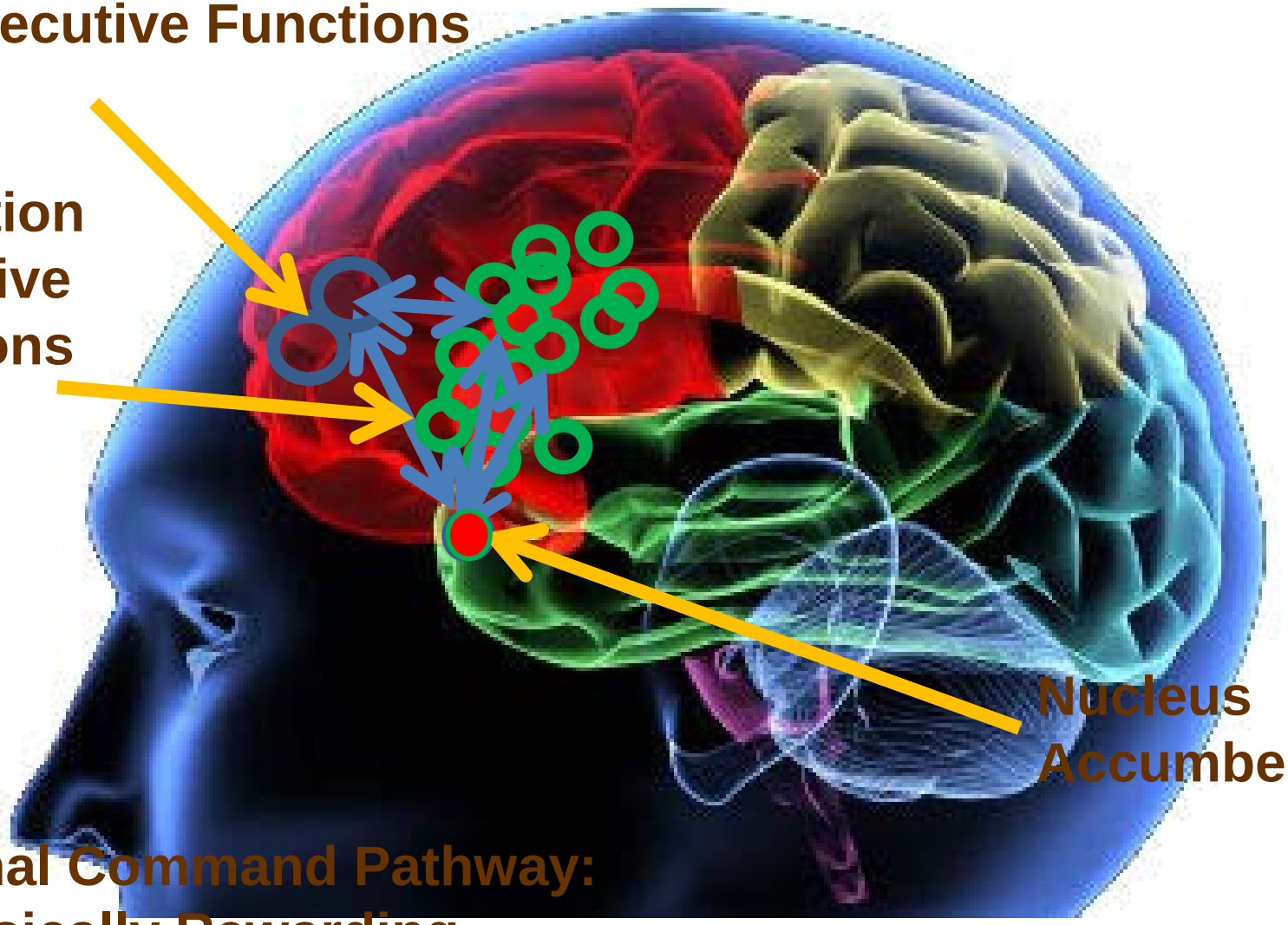
Explanation of Executive Functions



Explanation of Internal Command/External Demand



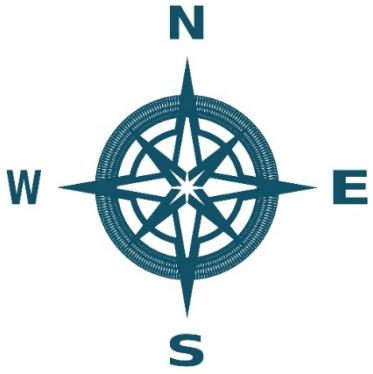
Engagement of Self-Determination and Self-Regulation

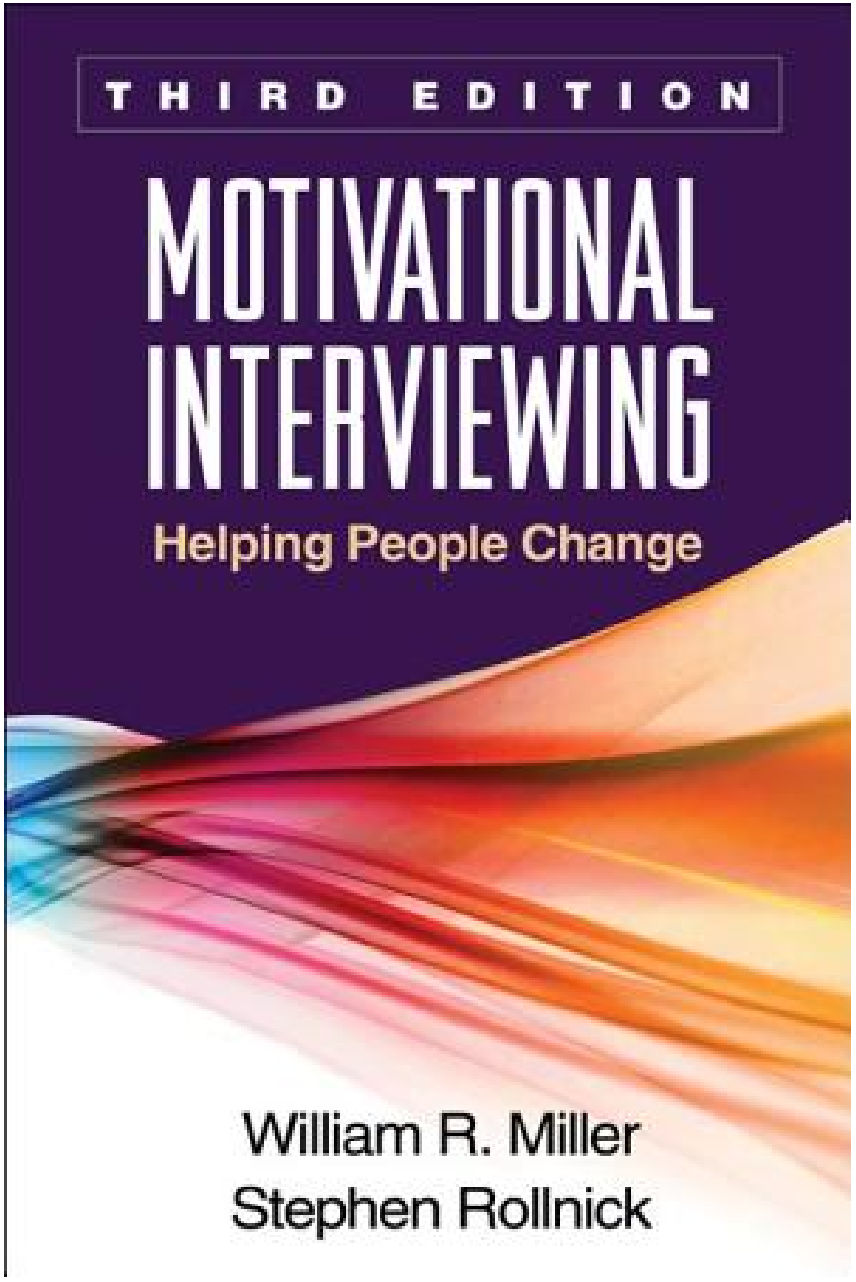


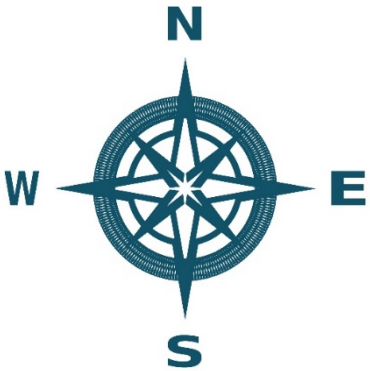
Internal Command Pathway:
Intrinsically Rewarding

Chapter 21
Motivational Interviewing with Adolescents and Young Adults

John S. Baer and Peggy L. Peterson



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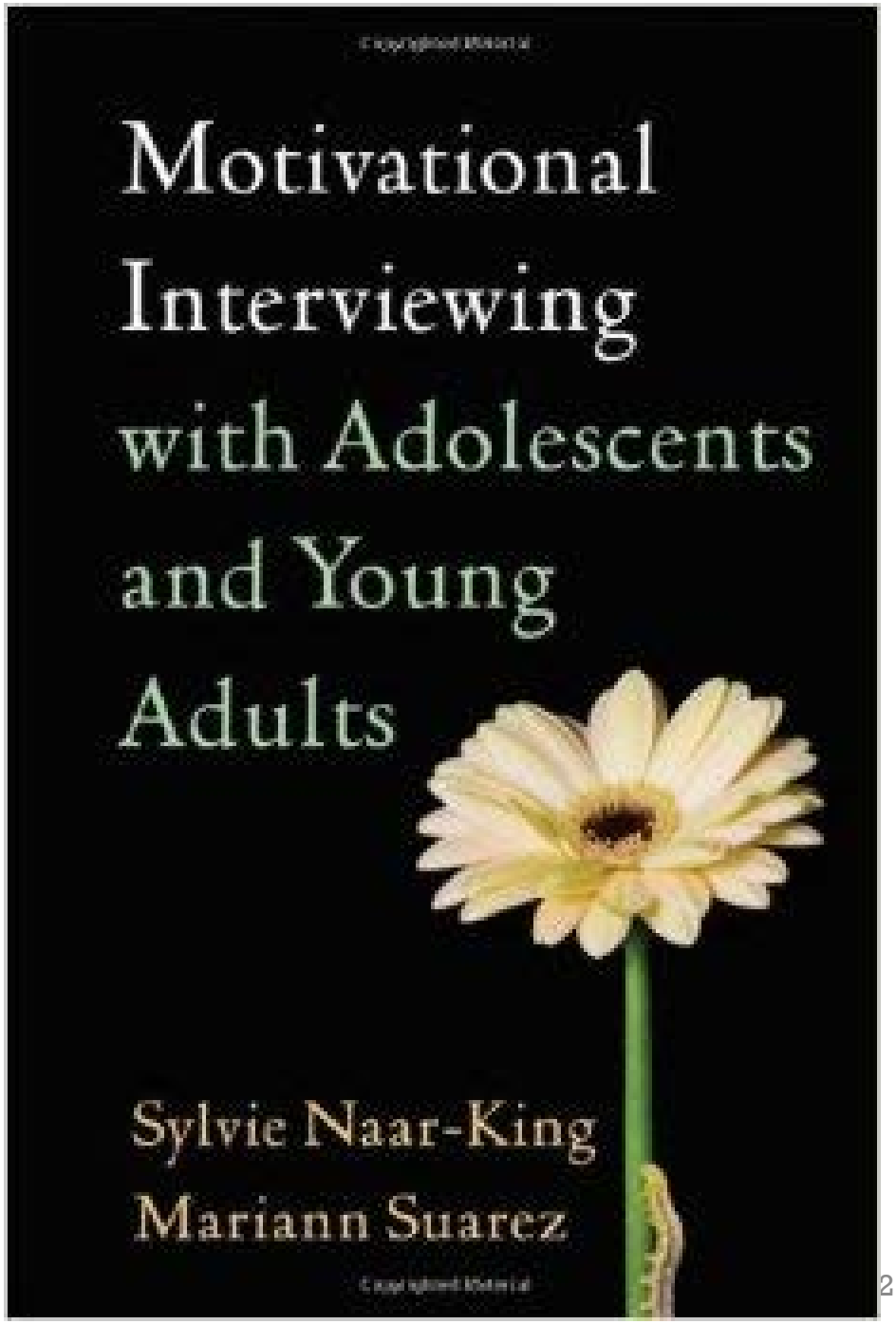
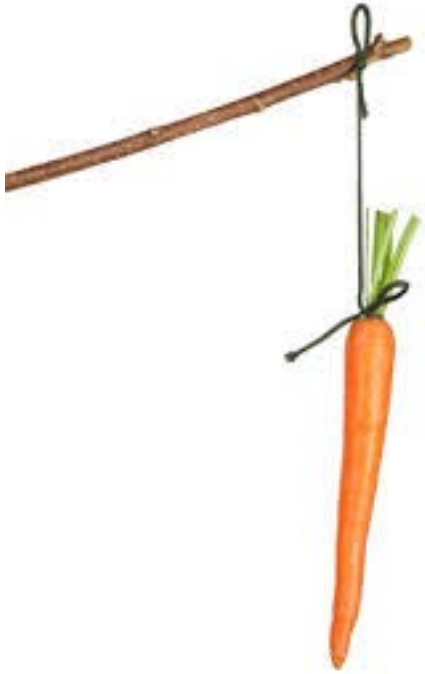
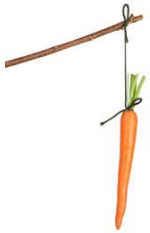

Motivational Interviewing with Adolescents and Young Adults
Sylvie Naar-King
Mariann Suarez



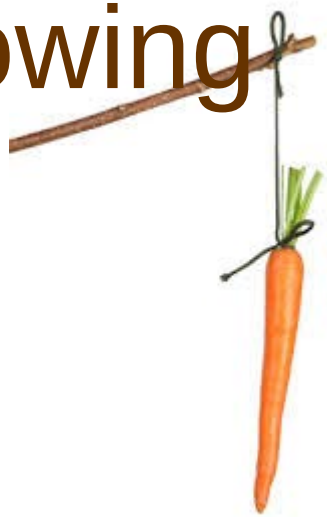
Key Concept

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.

External Control Strategies



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.

External Control Strategies

Punishment in mild form can be an effective means of obtaining compliance with external demands. When choosing to use punishment, heed the following cautions:

Using Punishment to Increase Production

- 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.

External Control Strategies

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

- 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

- 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

- 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

- 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

- 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

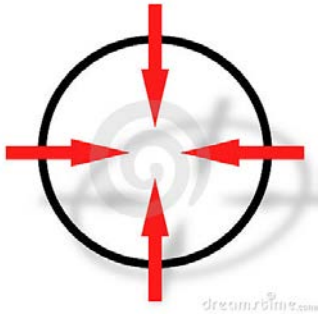
- Shift cues a relatively quick change in the direction and engagement of perceptions, emotions, thoughts or actions in reaction to what is occurring in the internal or external environments.

- Prompt example: “The museum is closed for emergency repairs, so we won’t be able to go on the field trip.”

Monitor

- 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."

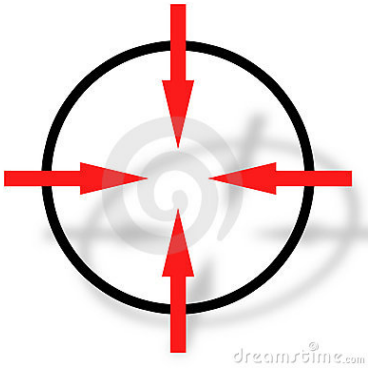


Modulate/Adjust

- 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."

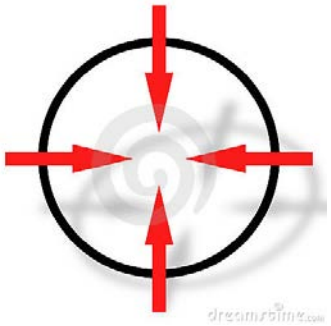
  "Please tone it down a bit."



Balance

- 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.

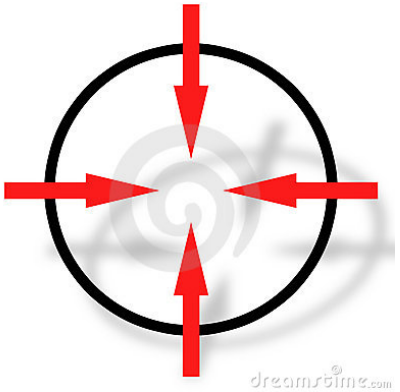
- Prompt example: "Work as quickly as you can, but be careful not to make any mistakes."



Correct

- 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

- 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

- 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

- 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

- 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

- 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

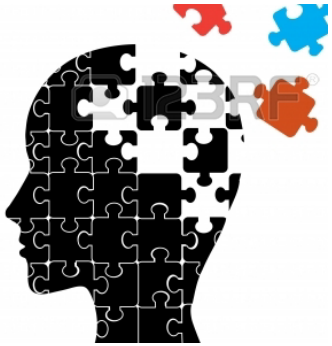
- Manipulate cues the use of working memory and other cognitive processes for the manipulation of perceptions, feelings, thoughts or actions as they are being held in mind or being accessed in the environment.

- Prompt example: “Visualize what it would look like if you turned it upside down.”

Store

- 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

- 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

- 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."

Anticipate

- 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

- 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

- 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

- 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

- 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."

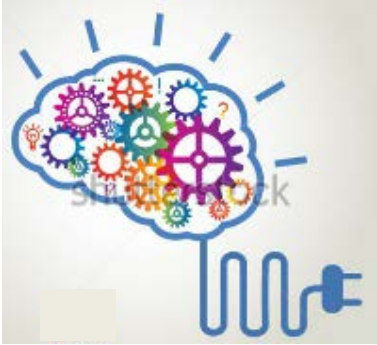
  "This problem will require some novel thinking if you are going to find a solution."

Associate

- 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

- 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).

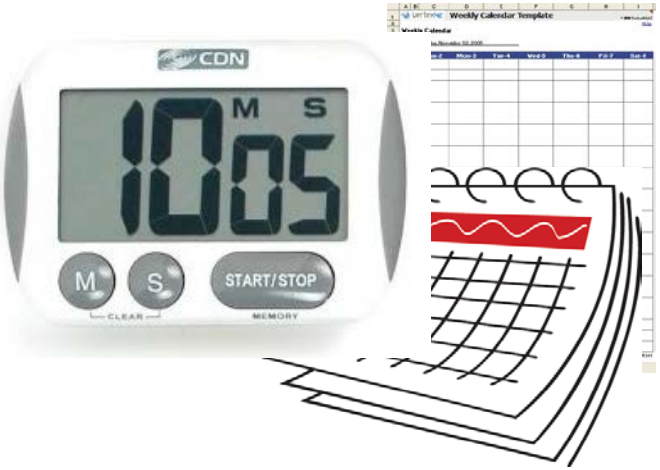
- Prompt example: "Write down what you will do over the weekend and when you will do it so that you will be ready for the test on Monday."

Choose/Decide

- 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."

External Control Strategies

Provide time management aids, such as calendars, clocks, timers, schedules, peer leaders and coaches, work teams, etc.



Key Concept

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

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.

Bridging Strategies

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

Bridging Strategies

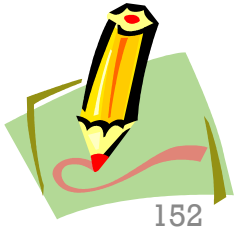
Teach self-regulation capacities with specific skill routines using Cognitive Strategy Instruction approaches (e.g. Graham & Harris Self-Regulated Strategy Development approach for Written Expression).

Five Stages of Strategy Instruction

1. Explain the purpose of self-regulation strategies in general and describe and discuss the specific steps of the strategy that will be taught.

Five Stages of Strategy Instruction

2. Model the use of the strategy using language and examples that connect with the students.



Five Stages of Strategy Instruction

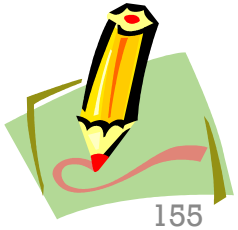
3. Students memorize the steps in the strategy as well as any mnemonics that are used as part of the strategy.

Five Stages of Strategy Instruction

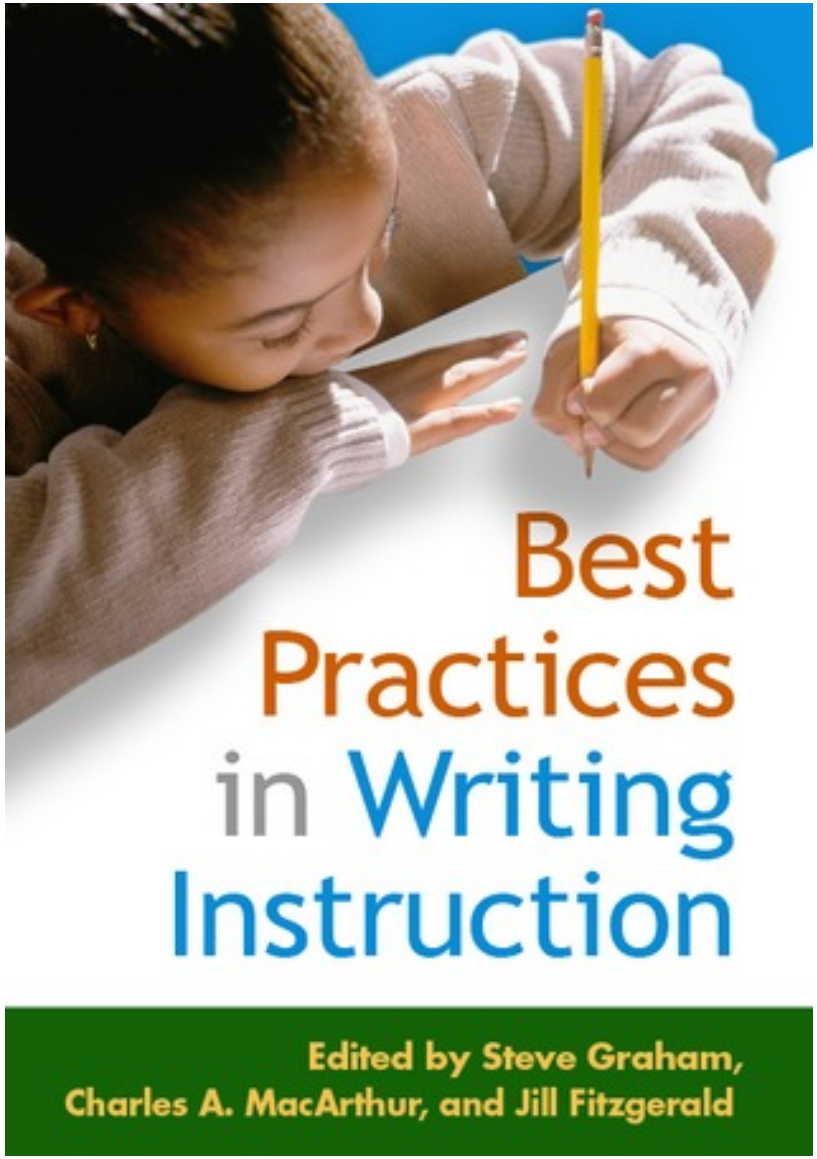
4. Teacher supports the implementation of the strategy by the students, scaffolding as necessary to help the students to master the use of the strategy.

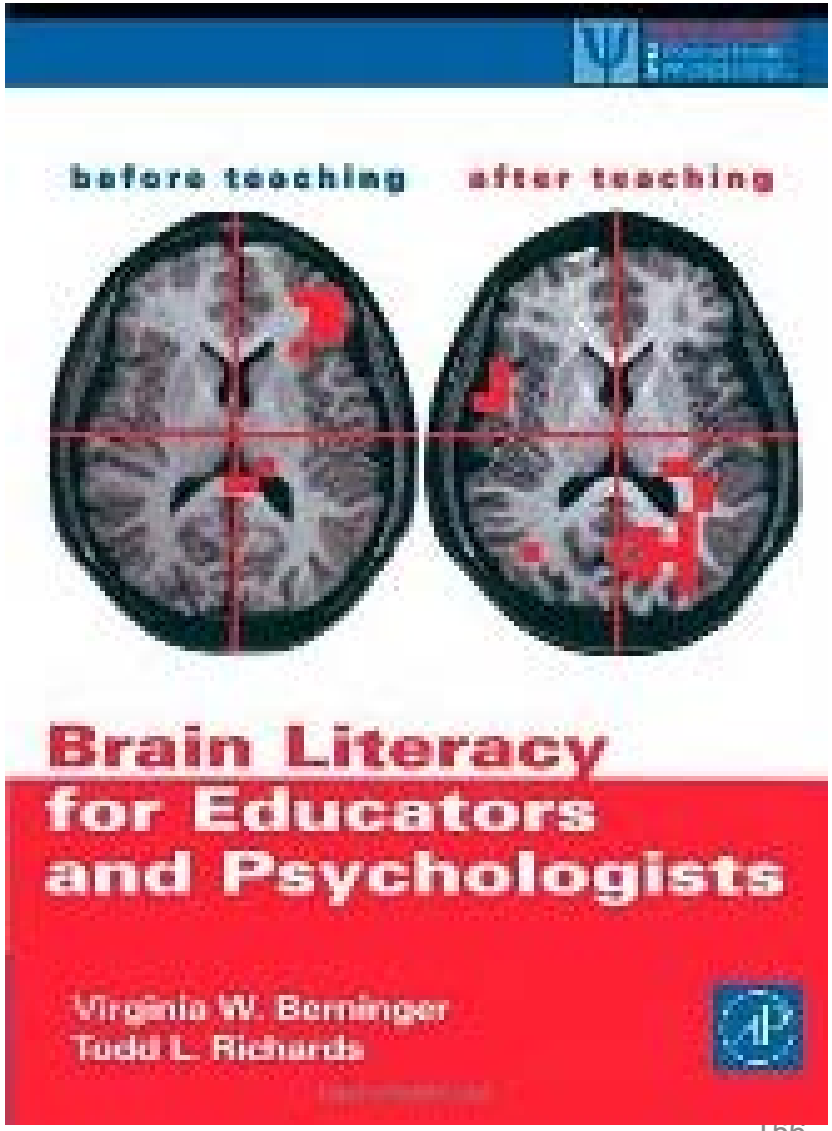
Five Stages of Strategy Instruction

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.

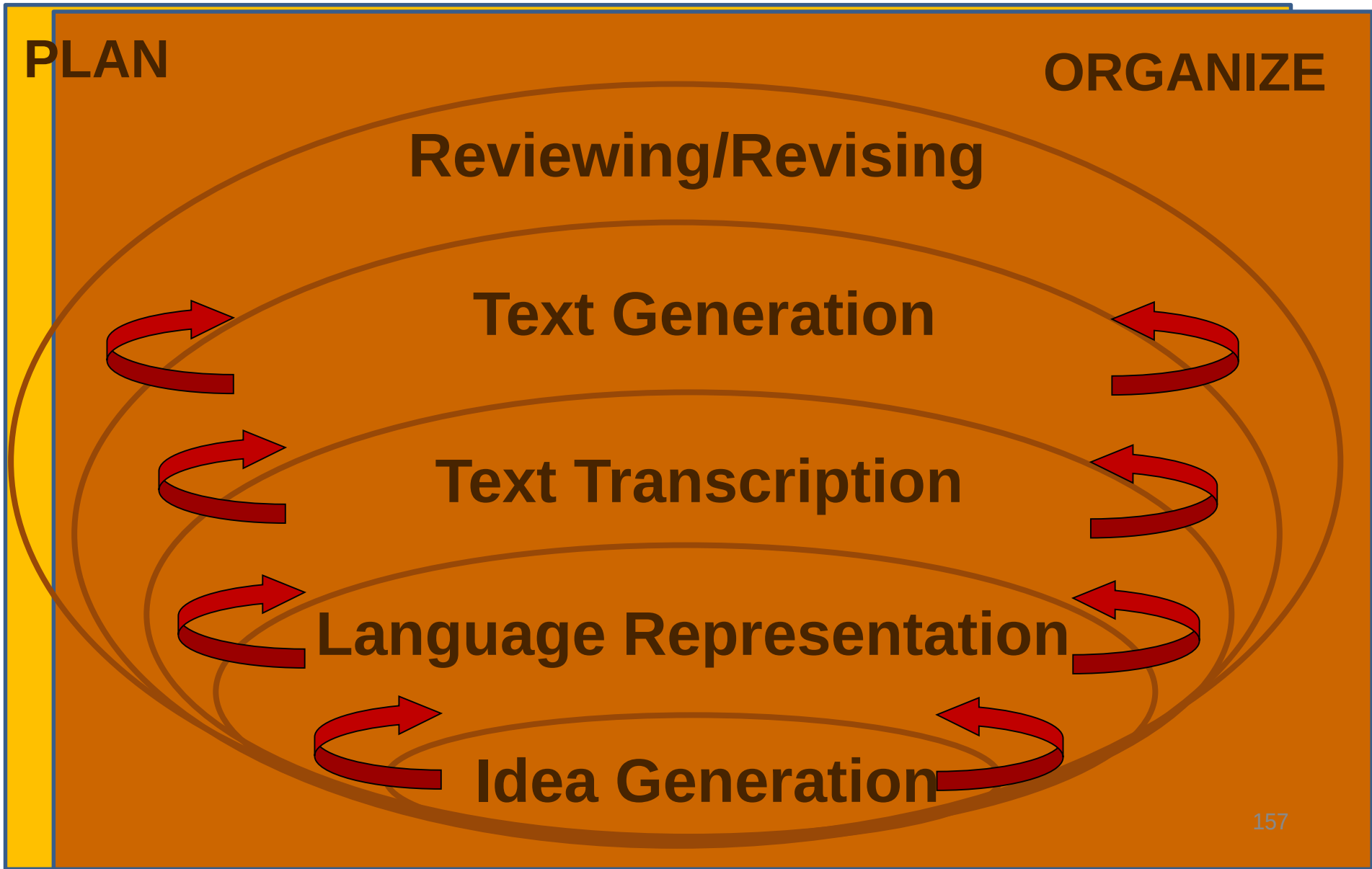


Source Acknowledgements





Writing as a Holarchically Organized Process



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. Iam prety gode as well. It is rell inters ing. 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."

Executive Functions and Writing

- What Evan wrote for me:

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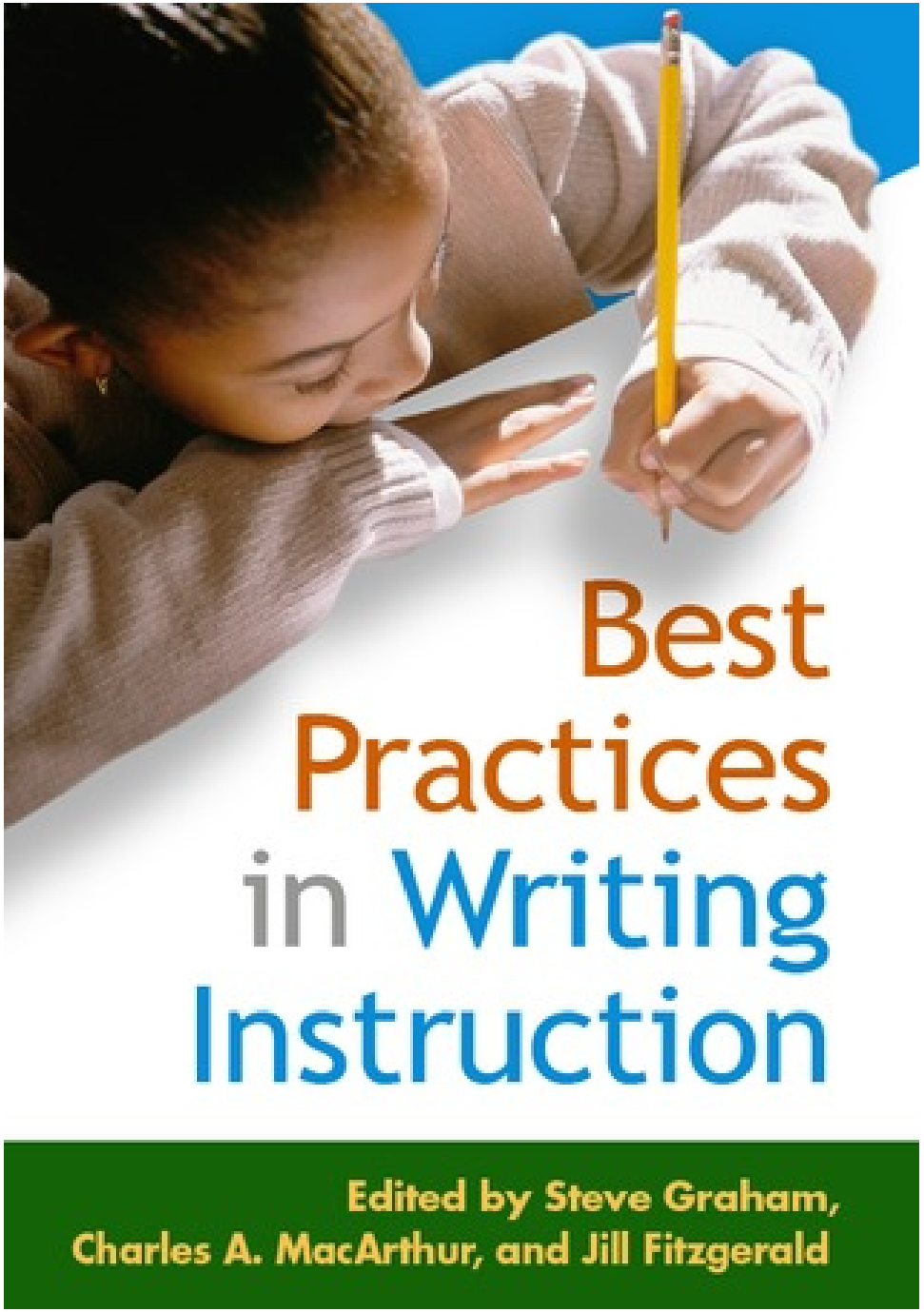
- What Evan told me:

  "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)

The Report Writing Strategy

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.

Web for what I know and what I want to learn

Lemurs

Habits

Active at night

_____

_____

_____

Looks

Large eyes
Long tails
Rings on tail

_____

Live

jungle
trees
Country???
zoos

Pets?

Can they be pets?

_____

_____

_____

Eat?

What do they eat?

_____

_____

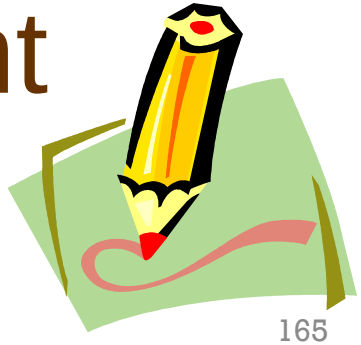
_____

The Report Writing Strategy

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.

The Report Writing Strategy

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.



Scaffolding Step 9

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?

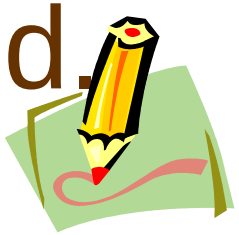
Scaffolding Step 9

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.

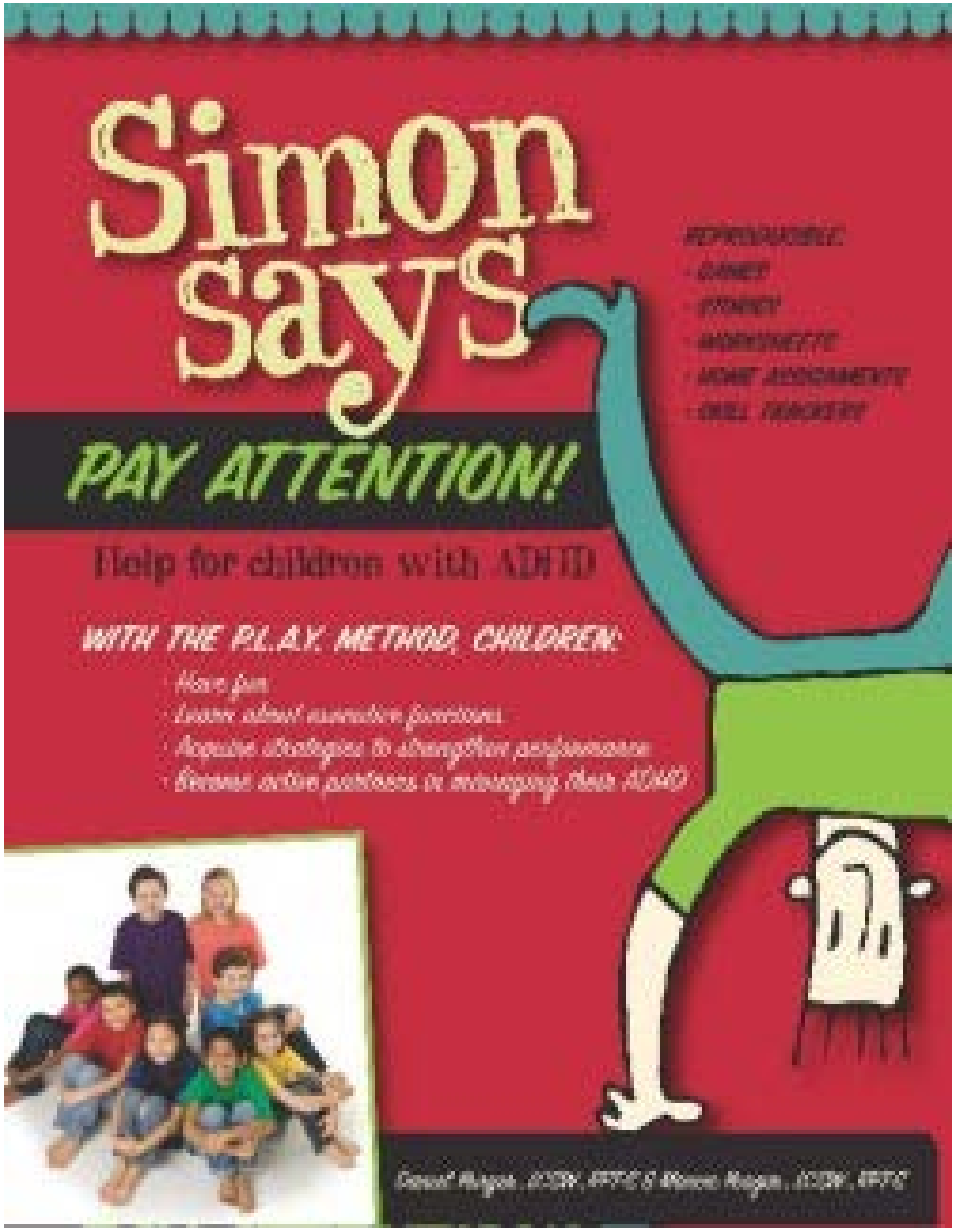


Bridging Strategies

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.

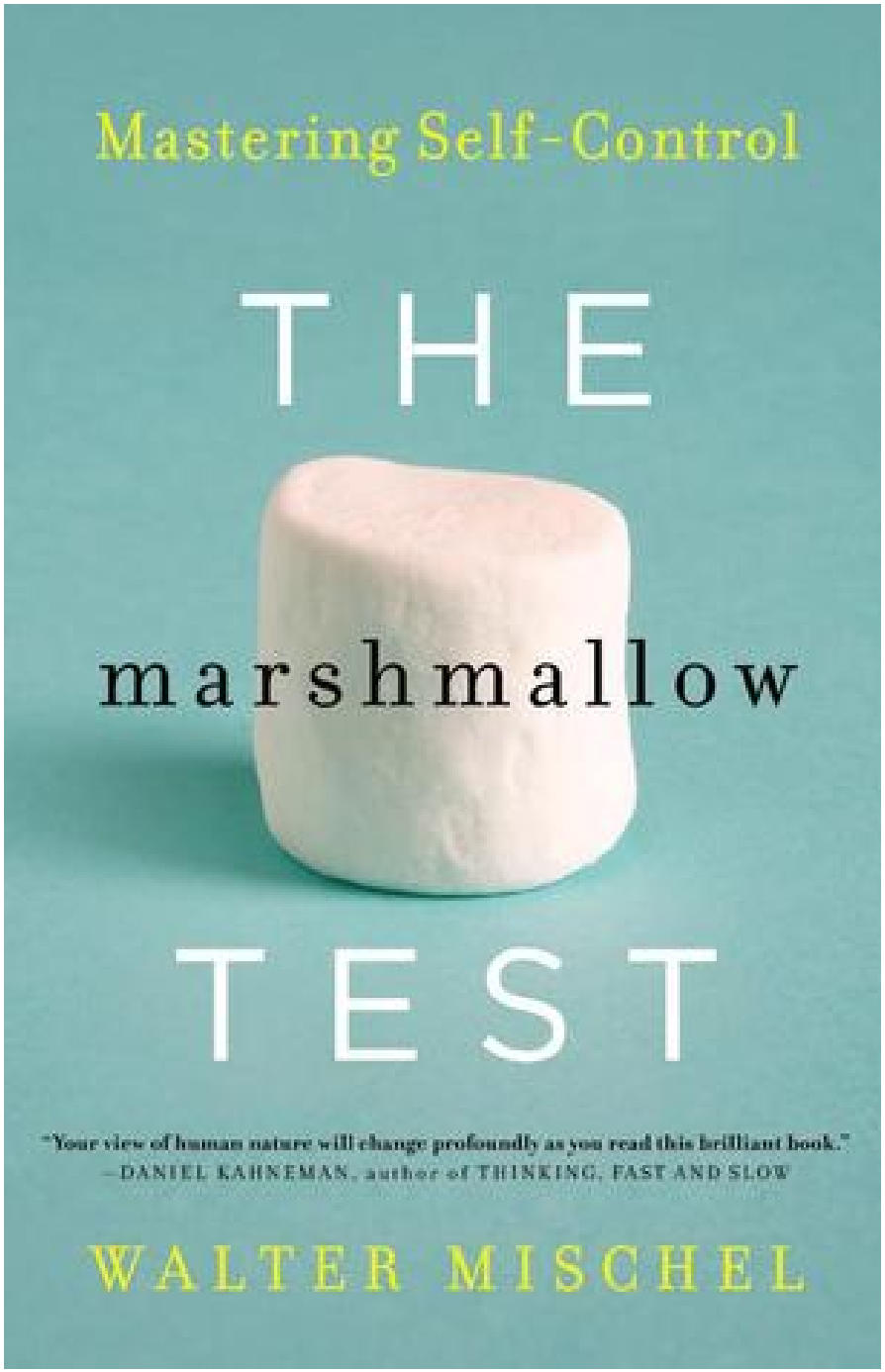
Bridging Strategies

Whenever possible, use game formats and game strategies to practice the use of executive functions.



Simon Says Pay Attention: Help for Children with ADHD

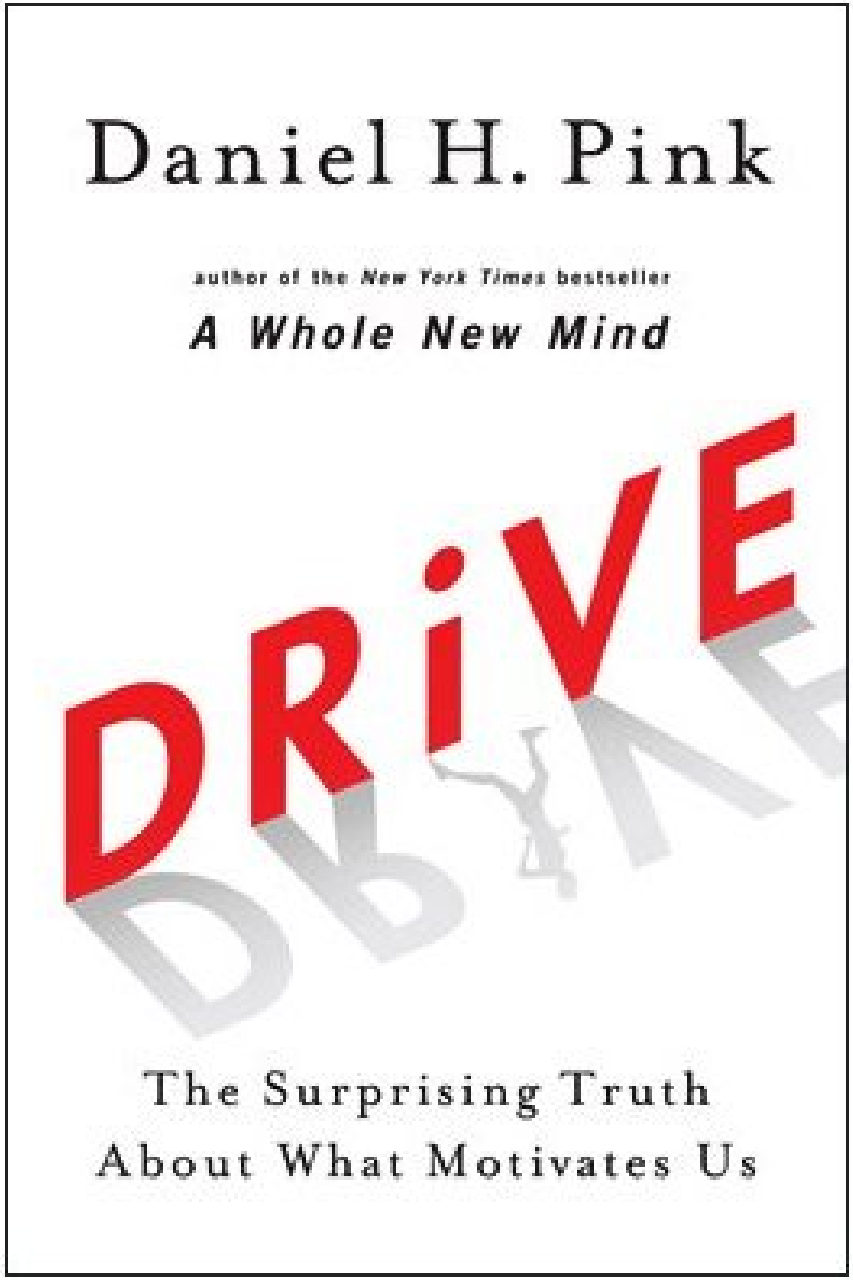
Daniel Yeager & Marcie Yeager


Mastering Self-Control
THE
marshmallow
TEST
"Your view of human nature will change profoundly as you read this brilliant book."
—DANIEL KAHNEMAN, author of THINKING, FAST AND SLOW
WALTER MISCHEL

Bridging Strategies

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

Bridging Strategies

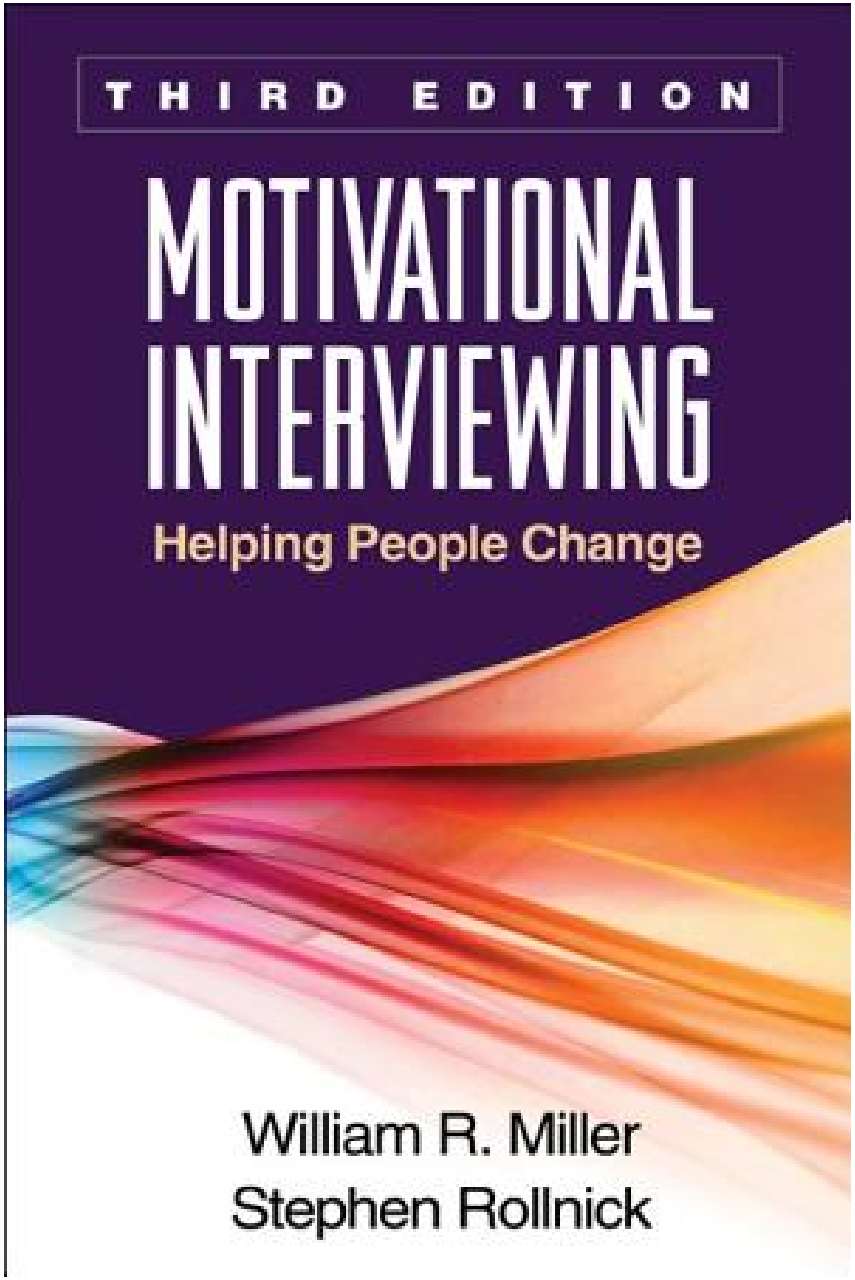
Develop a common vocabulary and set of nonverbal symbols for describing or signifying self-regulation capacities and signaling their use (e.g., cueing flexibility with “The Coconut Story”)

Case Example: Zach

Chapter 21
Motivational Interviewing with Adolescents and Young Adults

John S. Baer and Peggy L. Peterson

Page 320 - 332



Motivational Interviews with Zach

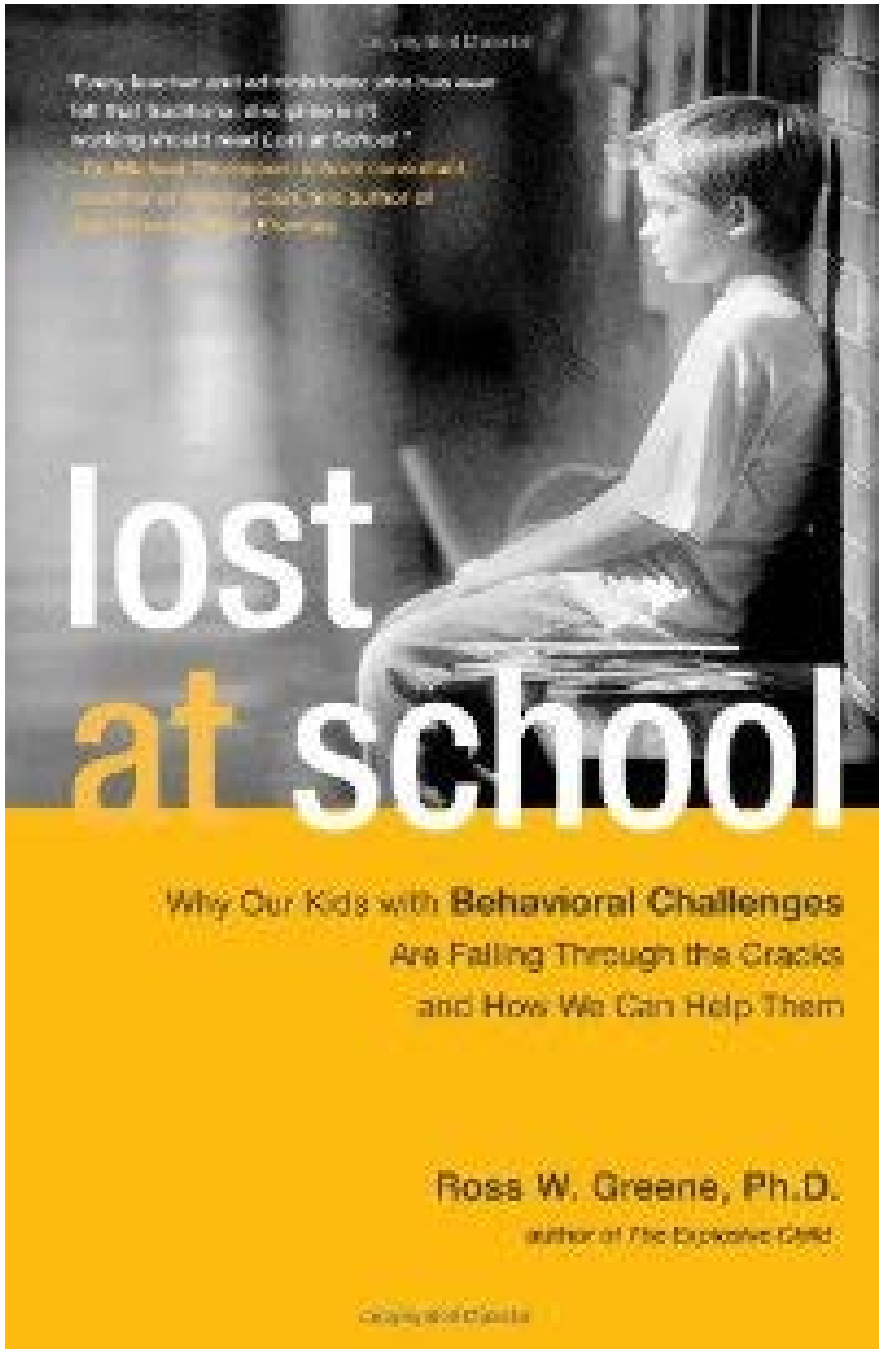
“I’m here to help you get what you want, but in order to do that I need to know what it is that you want.”

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



Collaborative Problem-Solving with Zach

"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?"

Collaborative Problem-Solving with Zach

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.”

Collaborative Problem-Solving with Zach

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."

Goal Setting with Zach

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**

Cognitive Behavior Therapy

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.

Cognitive Strategy Instruction

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.

Cognitive Strategy Instruction

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

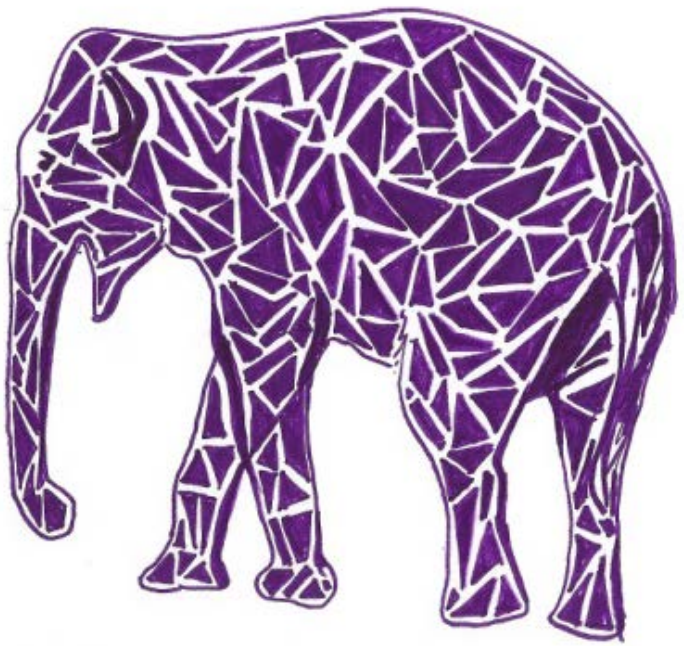
Improve my mood; get engaged with class

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?

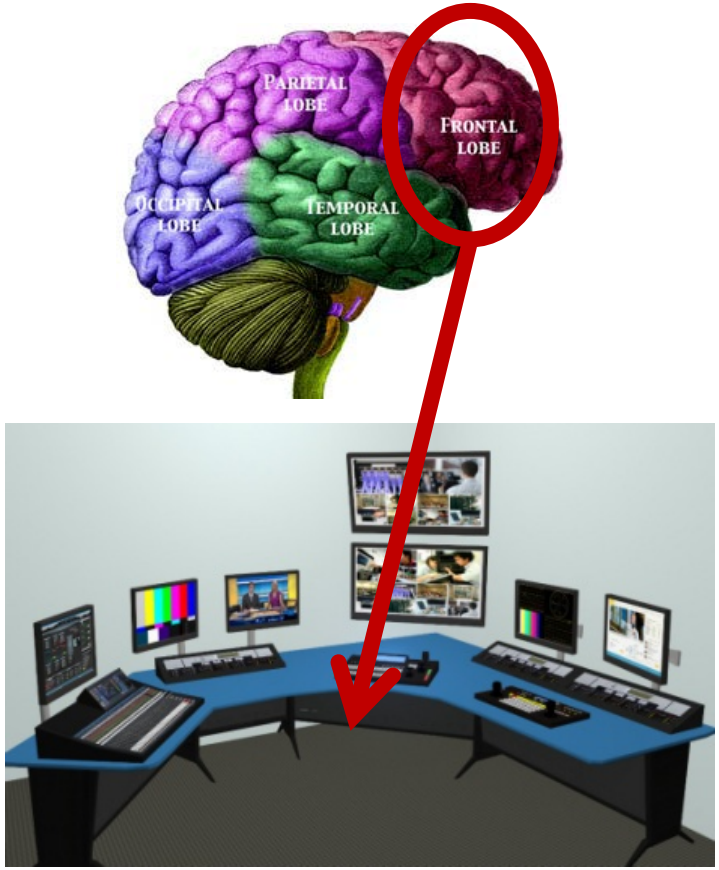
Say: I need to use the Purple Elephants Strategy



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

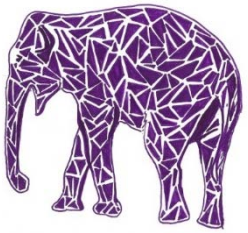
Say: I'm not sure.

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?

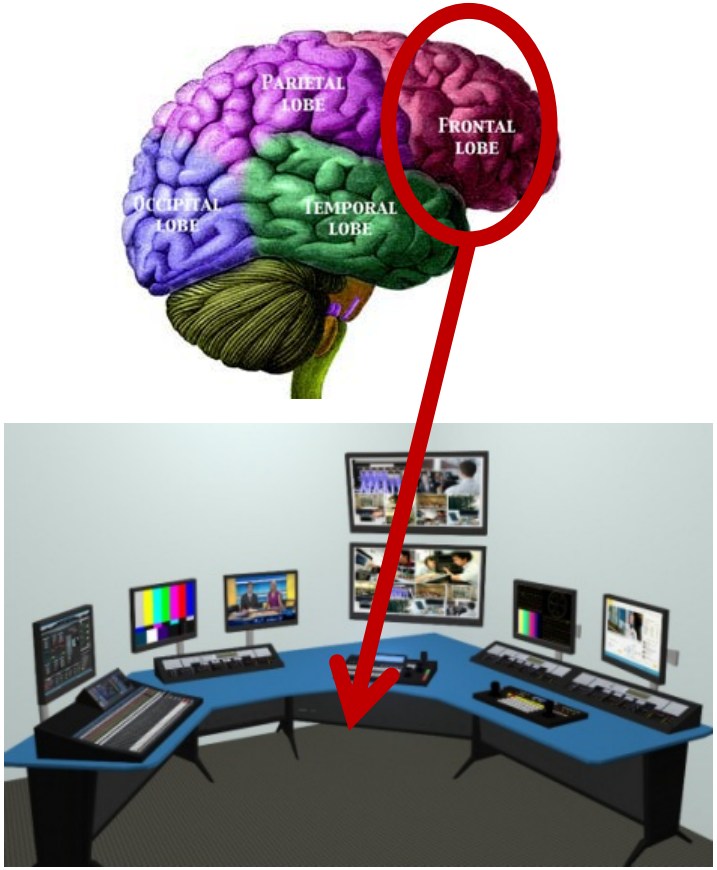
OK, I'm on it.

I'm not sure.
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!

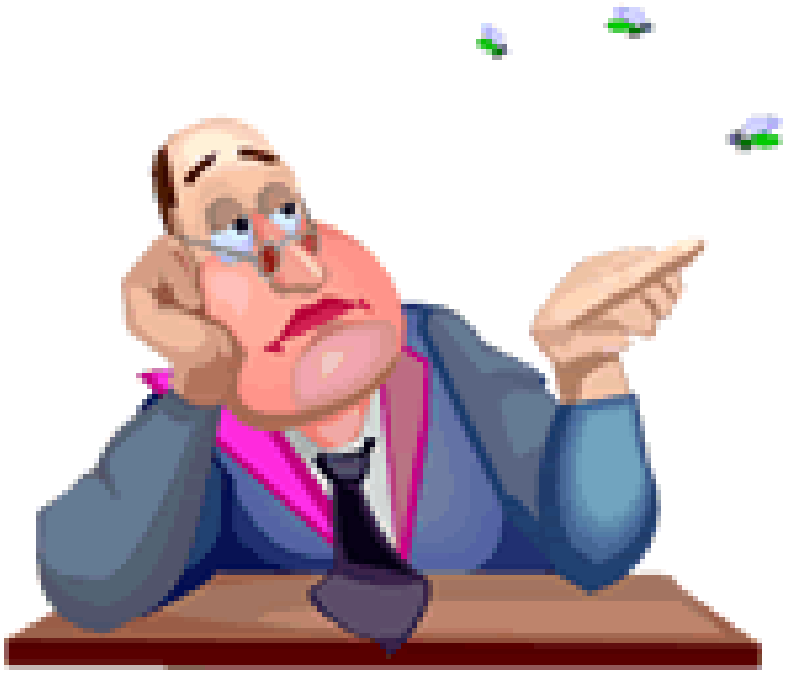
I am energized and ready
To pay attention!

What should I be doing for class?

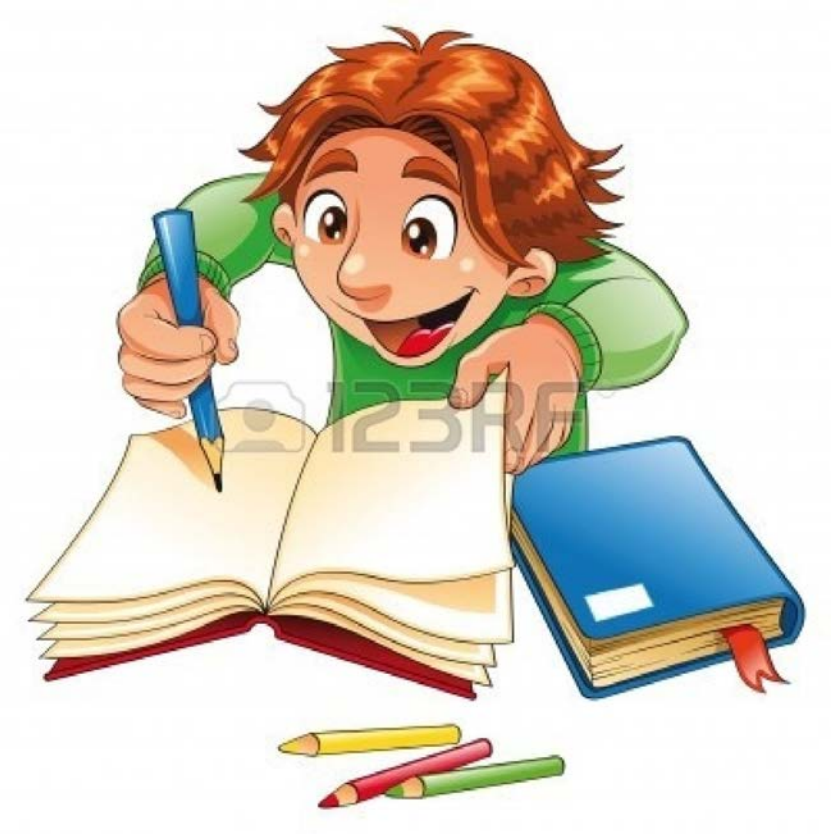
OK, I'm on it.

I'm not sure.
will ask for help.

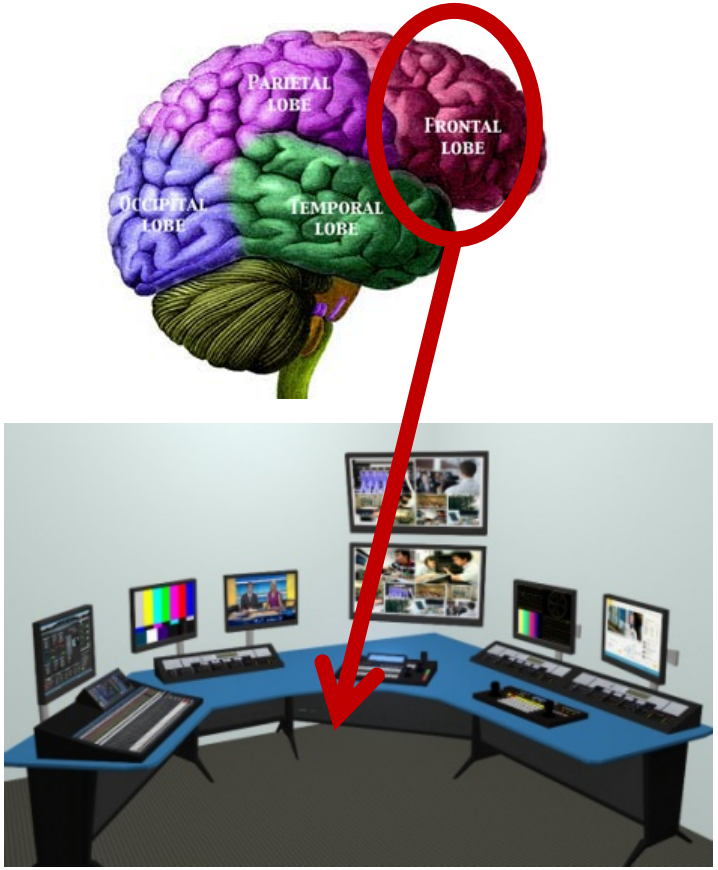
Ask: Am I doing my class work?



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!

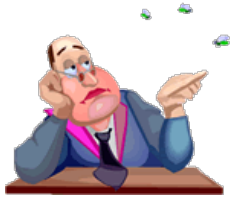
Say: I can complete my class work if I know what I need to do and how to do it.
Ask: Do I know how to do this work?"

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 in control now!

I am energized and
ready to work!

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.

Cognitive Behavior Therapy

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

Cognitive Distortion	Cognitive Correction
Dichotomous Thinking: "I'm either a good student or a failure."	**Contextual Thinking:** "Sometimes I perform poorly but many times I perform well."
Overgeneralizing: "I hit the wall in class today and couldn't find the door. I have no control over my emotions."	**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.
Mindreading: "I didn't do all of the assigned work. I know the teacher is disappointed with me."	**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

Cognitive Distortion	Cognitive Correction

Teacher Training

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

Teacher Training

- 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.

Cognitive Strategy Implementation

- 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.

Progress Monitoring Form for Zach T **Date: _____**

Goal 1: Managing Frustration and Engagement

3	Fully engaged without frustration	Maintained positive engagement throughout class and no frustration was apparent.
2	Frustration managed with self cued strategy	Frustration was apparent but was effectively managed and positive engagement occurred likely due to self-cued use of strategies.
1	Frustration managed with teacher cue	Frustration was apparent but was effectively managed and positive engagement occurred after teacher provided a cue for strategy use.
0	Frustration not managed	Frustration was apparent and strategy use was cued by teacher but positive engagement did not occur and student left class.

Class: _____

Frustration Management	**3**	**2**	**1**	**0**	**Work Modified: Yes No**	**Comments:**
Attention	3	2	1	0	**Work completed with extended time? Yes No**	
Work Completion	3	2	1	0		

Progress Monitoring Form for Zach T

Date: Monday, Feb 4th

Goal 1: Managing Frustration and Engagement

3	Fully engaged without frustration	Maintained positive engagement throughout class and no frustration was apparent.
2	Frustration managed with self-cued strategy	Frustration was apparent but was effectively managed and positive engagement occurred likely due to self-cued use of strategies.
1	Frustration managed with teacher cue	Frustration was apparent but was effectively managed and positive engagement occurred after teacher provided a cue for strategy use.
0	Frustration not managed	Frustration was apparent and strategy use was cued by teacher but positive engagement did not occur and student left class.

Goal 2: Focusing and Sustaining Attention During Class

3	Attended the entire time	Attention was focused and sustained during the entire class period
2	Attended most of the time	Attention was focused and sustained often during the class period.
1	Attended some of the time	Attention focused and sustained occasionally during the class period.
0	Attended none of the time	Attention was never focused or sustained during the class period.

Goal 3: Completing Assigned School Work

3	All work completed	All assigned class work and homework is fully completed during class time.
2	Most work completed	Most assigned class work and homework is completed during class time.
1	Some work completed	Some assigned school work and homework is completed during class time.
0	No work completed	No assigned school work and homework is completed during class time.

Class: MATH

Frustration Management	(3)	2	1	0	Work Modified: Yes (No)	Comments/Work not completed: BOY HAS NOTICEABLY MORE EXCITED ATT TO GREAT START ☺
Attention	3	(2)	1	0	Work completed with extended time?	
Work Completion	(3)	2	1	0	Yes (No)	

Class: Science

Frustration Management	(3)	2	1	0	Work Modified: Yes No	Comments/Work not completed:
Attention	(3)	2	1	0	Work completed with extended time?	Did well today
Work Completion	(3)	2	1	0	Yes No	

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.

Progress Monitoring

- Weekly ratings were summarized to help school staff monitor progress and provide Zach with feedback about his performance.

DAILY PROGRESS BY CLASS

	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
ENGAGEMENT	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	25-Feb	26-Feb	27-Feb	28-Feb	1-Mar
Math	3	3	3	3	2	0	2	0	0	1	1	0	3			0	3	2	2	3
Science	3			3	3	0	2	0	0	0		0	3			0	2	2	0	2
Social Studies	3	3	3	3	2	0	3	2	3	3	3	3	2			3		1		
English	3	2	3	3	0	3	3	0	3	0	0	0	3				3	3	3	3
Reading	3	3	3	3	0	0	3	3	3	0	3	3	3				3	3	3	3
Math Facts		0	3	3	3	0	3	0	3	0	3					3	0	3	3	3

	WEEK 5					WEEK 6					WEEEK 7					WEEK 8				
ENGAGEMENT	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-M
Math	3	3	3	1	3	3		2		1	0	0	1	0	3	1	0			
Science	0		2	1	3	3				0	0	0	0	0	3	1	3			
Social Studies	3	3	2	1	3	3				3	3	3	3	3	3	3				
English	2	2	3	1	3			3		3	3	3	0	3	3	3		3		
Reading		3	3	2	3			3		3	3	3	3	3	3	3	3	3		
Math Facts	0	3	0	3	3	3		3		3	3	3		3	0	3		3		

	WEEK 9					WEEK 10					WEEK 11					WEEK 12				
ENGAGEMENT	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	29-Apr	30-Apr	1-May	2-May	3-May
Math		2	2			3	0	0	3		0		0				3	0	0	3
Science		3	3			3	0	0	0	3	3		3				3	2	2	
Social Studies		3				3	1	3	3	3	3		3				1	2	2	0
English		3	3			2	0	1	3	3	0		3			3	0	3	3	
Reading		3	3			3	2	3	3	3	1		3			3	3	3	3	3
Math Facts		3	3			0		3	3	3	1						3	2	3	3

	WEEK 13					WEEK 14				
ENGAGEMENT	6-May	7-May	8-May	9-May	10-May	13-May	14-May	15-May	16-May	17-May
Math	0	1	0	1	2		0		1	1
Science	2	3	2	3	2	2	1		1	0
Social Studies	3	3	3	0		0			0	0
English		3	3	3	3	0	3		2	0
Reading		3	3	3	3	2	3		2	3
Math Facts		3			3					3

	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
ATTENTION	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	25-Feb	26-Feb	27-Feb	28-Feb	1-Mar
Math	2	2	3	3	2	0	2	0	0	0	1	0	2			0	3	2	2	3
Science	3			3	3	1	3	0	0	0		0	2			1	2	2	0	2
Social Studies	3	3	3	3	3	0	3	3	3	3	3	3	3			3		1		
English	3	3	2	2	0	3	3	0	3	0	0	0	3				2	3	3	3
Reading	3	3	3	1	0	0	3	3	3	0	3	3	3				3	3	3	3
Math Facts		0	3	3	3	0	3	0	3	0	2					2	0	3	3	2

	WEEK 5					WEEK 6					WEEEK 7					WEEK 8			
ATTENTION	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	25-Mar	26-Mar	27-Mar	28-
Math	3	2	2	1	3	3		1		1	0	0	1	0	0	1	0		
Science	0		3	1	3	3				0	0	0	1	0	3	1	3		
Social Studies	3	2	2	1	3	3				3	3	3	3	2	3	3			
English	3	2	2	1	3			3		2	1	3	1	2	2	2		3	
Reading		2	3	1	3			3		2	2	3	3	2	1	0	2	3	
Math Facts	0	3	0	3	3	3		3		3	3	3		3	0	3		3	

	WEEK 9					WEEK 10					WEEK 11					WEEK 12				
ATTENTION	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	29-Apr	30-Apr	1-May	2-May	3-Ma
Math		2	2			3	0	0	3		0		0				0	0	0	3
Science		3	2			3	0	0	1	3	3		3				2	2	0	
Social Studies		3				3	0	3	3	3	3		3				2	2	2	0
English		2	3			2	0	2	3	3	1		3			2	3	3	1	
Reading		2	3			2	1	2	3	3	1		3			3	3	3	3	2
Math Facts		3	3			0		1	3	3	1						2	2	3	3

	WEEK 13					WEEK 14				
ATTENTION	6-May	7-May	8-May	9-May	10-May	13-May	14-May	15-May	16-May	17-May
Math	0	1	1	1	2		0		1	1
Science	2	3	2	3	1	2	1		1	0
Social Studies	2	3	2	0		0			0	0
English		3	0	1	2	0	2		2	1
Reading		1	3	3	3	1	3		2	3
Math Facts		3			3					3

	WEEK 1					WEEK 2					WEEK 3					WEEK 4				
WORK CONPLETIO	4-Feb	5-Feb	6-Feb	7-Feb	8-Feb	11-Feb	12-Feb	13-Feb	14-Feb	15-Feb	19-Feb	20-Feb	21-Feb	22-Feb	23-Feb	25-Feb	26-Feb	27-Feb	28-Feb	1-Mar
Math	3	3	3	3	2	0	2	0	0	0	1	0	2			0	3	2	0	3
Science	3			3	3	0	2	0	0	0		0	3			0	2	0	0	1
Social Studies	3	3	3	3	0	0	3	3	2	0	2	0	0			1		1		
English	3	3	0	3	0	3	3	0	3	0	0	0	3				2	3	3	3
Reading	3	3	3	3	0	0	3	3	3	0	3	3	3				3	3	3	3
Math Facts		0	3	3	3	0	3	0	3	0	2					3	0	3	3	3

	WEEK 5					WEEK 6					WEEEK 7					WEEK 8			
WORK COMPLETIO	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	25-Mar	26-Mar	27-Mar	28-
Math	3	1	2	1	3	3		0		0	0	0	0	0	0	1	0		
Science	0		2	1	3	0				0	0	0	0	0	3	0	3		
Social Studies	2	1	0	0	2	2				3	3	3	3	2	1	3			
English	3	2	2	1	3			3		2	1	3	0	2	1	2		3	
Reading		2	3	1	3			3		1	2	3	1	2	1	0	2	3	
Math Facts	0	3	0	2	2	3		3		3	3	3		3	0	3		3	

	WEEK 9					WEEK 10					WEEK 11					WEEK 12				
WORK COMPLETIO	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	29-Apr	30-Apr	1-May	2-May	3-May
Math		2	1			3	0	0	3		0		0				0	0	0	3
Science		3	2			3	0	0	1	3	3		3				2	2	0	
Social Studies		2				2	0	3	2	1	3		2				2	2	1	0
English		2	3			1	0	2	3	3	0		3			2	3	3	1	
Reading		3	3			2	1	2	3	3	2		3			3	3	3	3	3
Math Facts		3	2			0		0	3	3	3						2	2	3	3

Zach T.	WEEK 13					WEEK 14				
WORK COMPLETION	6-May	7-May	8-May	9-May	10-May	13-May	14-May	15-May	16-May	17-May
Math	0	0	0	0	1		0		0	1
Science	1	2	2	3	1	0	1		1	0
Social Studies	0	0	0	0		0			0	0
English		3	0	0	2	0	2		3	1
Reading		2	3	3	3	1	3		2	3
Math Facts		3			3					3

END OF YEAR SUMMARY ALL CLASSES

ENGAGEMENT	%
Rated 3, 2, or 1	78%
Rated 0	22%
ATTENTION	%
Rated 3, 2, or 1	78%
Rated 0	22%
WORK COMPLETION	%
Rated 3, 2, or 1	70%
Rated 0	30%

8th Grade Outcomes

- 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

Key Concept

Once learned and practiced, Internal Control Strategies enable students to effectively “run their own shows.”

Internal Control Strategy

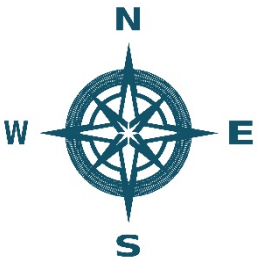
Once learned, the child can use internalized “self-talk” as a means of increasing awareness of executive functions and of when and how to use them (e.g., modified Berninger mantra for writing: “What I can think I can say.
What I can say I can write.
What I can write I can revise.”)

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).

Internal Control Strategy

Teach the use self-monitoring routines. These routines can be used to monitor and correct perceptions, feelings, thoughts and actions.



Key Concept

Some specific educational programs are designed, either explicitly or implicitly, to improve students' executive functions.

Case Example: Billy Lack of Inhibition?

Billy: Case Conceptualization

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.

Billy's Intervention: Orienting Phase

- 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.

Billy's Intervention: External Control Phase

- 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.

Billy's Intervention: External Control Phase

- 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

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 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.

Billy's Intervention: Progress Monitoring

- 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.

Billy's Intervention: Self-Regulation Phase

- 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.

Billy's Intervention: Carry-Over to Activity Level

- 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.