

Executive Functions in Education— A Mini Course

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EXECUTIVE FUNCTIONS ?????

- ▶ Descriptions of what EFs are
 - HOW, WHEN or IF we use
 - WHAT we know
 - In CONTEXT,
 - as EXPECTED or REQUIRED
 - SHIFTING as needed
- ▶ Descriptions of what EFs do
- ▶ Descriptions of where EFs are 'located'
 - ▶ How we regulate, change, adapt to meet demands of world around us

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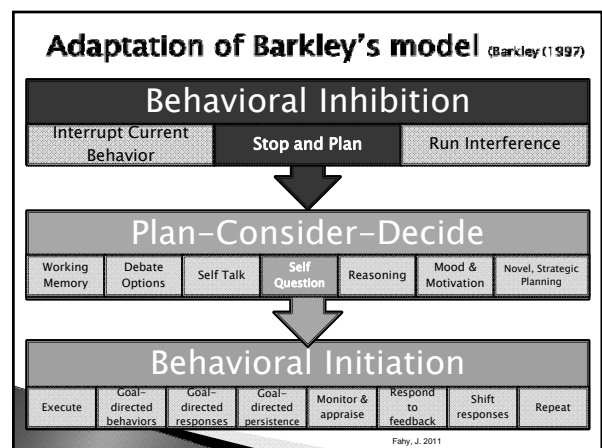
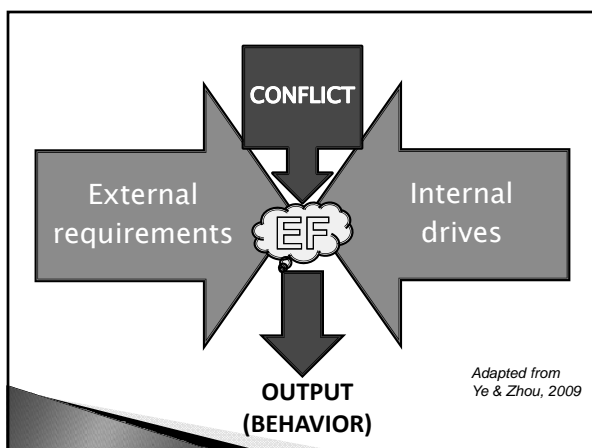
SOME DEFINITIONS.....

- ▶ "enable appropriate behaviors under novel circumstances in a developmental progression" (*Marlowe, 2000*)
- ▶ "...intentions capable of controlling subsequent conscious behaviors" (*Luria, 1973*)
- ▶ "those capacities that enable independent, purposive, self-serving behavior successfully" (*Lezak, 1983*)
- ▶ "processes that monitor for the occurrence of conflicts in information processing.....evaluate current levels of conflicts and trigger compensatory adjustments of processing pathways." (*Ye & Zhou, 2009*)
- ▶ "...distinct processes that do converge on a general concept of control functions....." (*Stuss & Alexander, 2000*)

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MODELS OF EXECUTIVE FUNCTIONS

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McCloskey's Model of EFs: (McCloskey, 2009)
5 tiers, 23 EF components

- I. Self-Control:
 - Self-Activation:* Awake, Alert, Attend
- II. Self-Control:
 - Self-Regulation:* Sensation, Perception, Cognition, Emotion, Action
- III. Self-Control:
 - Self-Realization:* Self-Awareness, Self-Analysis
 - Self-Determination:* Goal Generation, Long-Term Planning/Foresight
- IV. Self-Generation:
 - Mind-Body Integration, Sense of Spirit
- V. Trans-self Integration
 - Sense of purpose in cosmic order

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IMPORTANT NUGGETS OF INSIGHT

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- 1. EFs are **NOT** the same thing as knowledge or intellect.
- 2. EFs are a cluster of *interwoven metacognitive* skills.
- 3. EFs emerge & mature over the course of about 25 years.
- 4. EFs **interact with language** to support internalization of rules, problem solving, and self-regulation.
- 5. EFs interact w/social perception to **support social behavior**.
- 6. EFs help organize and apply knowledge to **support academic and vocational success**.
- 7. EFs are **often an assumed skill** in many environments, such as schools.

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FOUNDATIONAL COGNITIVE PROCESSES

Basic support

- 1. Attention
 - most basic foundational process, other than being alert
- 2. Inhibition
 - without inhibition, no other EF really works well
- 3. Working Memory
 - dependent upon attention

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COMMONLY RECOGNIZED COMPONENTS OF EF

- 1. Goal (Intention) Determination
- 2. Planning & Organization
- 3. Initiation & Persistence
- 4. Flexibility
- 5. Self-Monitoring & Regulation

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GOAL DETERMINATION

WHAT to do?

- Recognition of need or desire to act
- Behavioral determination
 - Use old routine?
 - Develop new plan?
- Predict outcomes, anticipate consequences
 - Do now, later, or not at all?
- Externally-controlled when young (RULES)
- Becomes increasingly internally-controlled
- Need sophisticated language to do well

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PLANNING & ORGANIZATION

HOW to do it?

- Develop relevant strategies to meet outcome
- Sequence plans, information, materials
- Account for time, expectations, requirements
- Determine what is necessary
- Seek relevant materials & information, or “make do” with what you have

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INITIATION & PERSISTENCE

CAN I start?

- Motorically initiate efforts, behaviors, responses
- Self-start rather than sitting around
- Time-sensitive initiation.... NOW, not later
- Maintain motoric efforts—persist
- Continually re-start efforts as needed
- Terminate efforts as appropriate

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FLEXIBILITY

Hmmm... CHANGE?

- Success requires change
- People WILL move your cheese
- Adapt, adapt, adapt!
- React strategically; re-group; re-plan
- Depends upon divergent thinking, verbal reasoning....

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SELF-REGULATE

**NOTICE
Evaluate
Appraise**

- Ongoing self-appraisal
- Ongoing self-awareness
- Ongoing analysis of own efforts, behaviors, responses, actions
- Recognition of failure/success in meeting goals
- Recognition of changing expectations or demands
- Recognition of overt and implied feedback
- Recognition of what went wrong...
- Evaluation of behavioral response-options
- Evaluation of need to stop, re-plan, re-start

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How Do We Get All of This?

- 25 years of development
- Environmental support
- Genetic roulette
- Scaffolded opportunities
- Coaches and models
- Decent language system
- Decent social perception system
- Avoidance of TBI

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PURPOSE OF IT ALL

SELF-DETERMINATION
 SELF-REALIZATION
 ENVIRONMENTAL MANAGMENT

Effect control over knowledge, learning, social insight
 Develop capacity to make 'good' decisions
 Acquire ability to get things done, on time
 Adapt and respond to unexpected, unplanned problems
 Acquire ability to display social competence
 Develop capacity to gain life wisdom
 Discern what is true, right, or lasting
 Perhaps, develop altruistic tendencies
 Eventually, develop ability to focus outside of the self,...
 concern for welfare of others

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EF PROBLEMS

- Attentional deficits
- Awareness deficits
- Impulse control issues
- Poor initiation and persistence
- Consistency problems
- Memory deficits
- Disrupted language or reasoning skills
- Impaired social/nonverbal perceptions
- Comorbid anxiety, stress, depression
- Grossly delayed development
- Disrupted or halted development

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LANGUAGE & EXECUTIVE FUNCTIONS

- Language supports capacity to engage in rule-governed behavior (Barkley)
- Language supports self-governed behavior (Vygotsky)
- Verbal working memory supports planful deliberation, consideration of multiple factors
- Language supports organization of complex behaviors and narratives
- Language provides for and supports use of compensatory strategies

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OPTIONS FOR EVALUATION

- Classroom / environmental observations
- Structured interviews
- Indirect observational rating scales
- Direct skill-measurement tests
- Work samples, performance reviews
- Interviews

- Student
- Parent
- Teacher

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PROBLEMS IN ASSESSMENT

- Structure inherent in most standardized tests
- Difficulty measuring global behaviors
- Most tests look at isolated EF skills....
- Need for more than one measure
- How to link assessment to treatment
- What is 'normal'?
- Need to get a profile of strengths, weaknesses
- Lack of tools to use for eval
- Who does this? Speech, psych...
- What are language skills? Attention? Reasoning? Processing? Fluency? Phonemic/Literacy? Academic?

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WHAT CAN YOU DO?

- Behavioral Rating Inventory of Executive Functions (BRIEF)
 - Self, parent, informant, teacher reports
 - Indirect, standardized measure of behaviors dependent upon EFs
 - Preschool, school-age, adult versions
- Behavioral Assessment of Dysexecutive Syndrome—Children (BADs-C)
 - 6 subtests, hands-on, novel problems,
 - Ages 8–18

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DIRECT, INFORMAL, OBSERVATION

- Plan a novel task
- Observe independent execution
- Use tool to capture observations
- Merge with interviews, indirect formal measures, other work samples, or other standardized tests, if you have them.

- Need to follow some rules.....

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RULES FOR INFORMAL EVAL

- Provide ultimate outcome requirements
- Do NOT provide plans
- Do NOT point out errors
- Let the child be “in charge”
- Resist urge to help—it isn’t actually helping
- Allow natural consequences
 - Failure
 - Unexpected outcomes
 - Inaccurate predictions
 - Disorganized approaches
- Observe spontaneous use of
 - Self-talk
 - Inhibition
 - Adaptation, flexibility

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DATA CAPTURING TOOLS FOR INFORMAL EVAL

- Observational Worksheet
 - Richard, G. & Fahy, J. (2005). The Source for Development of Executive Functions. East Moline, IL. LinguiSystems, Inc.
 - Need to know what is developmentally expected
 - Allows you to gain better idea of which EF skills are more problematic
- Executive Skills Questionnaire for Children
 - Pre-K, 1st–3rd, 4th–5th, 6th–8th
 - Dawson, P. & Guare, R. (2009). Smart but Scattered. NY: Guilford Press.
 - Dawson, P. & Guare, R. (2010). Executive Skills in Children and Adolescents: A Practical Guide to Assessment and Intervention. NY: Guilford Press
 - Offers developmental insight, expectations

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INFORMAL EF EVAL—TASK DEVELOPMENT

Requirements:

- Novel, unfamiliar
- Unstructured
- Yet within expected realm of development, life experience, life knowledge
- Must plan, organize
- Must self-initiate
- Must self-monitor
- Must self-inhibit
- Must self ID errors
- Must fix/adapt/adjust
- Must self-anticipate

- Examples:
- www.pbskids.org, ZOOM, activities from show
- Experiments
 - Build water filter, flinkers
- Cooking
 - Edible spiders
- Building
 - Milk carton boat
- Designing
 - Your own....

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INFORMAL EF TASK, CONT'D

- When, if ever, do you ‘help’?
 - Only after you’ve identified that a skill is absent
 - If persevere with no awareness
 - If cannot become relevant
 - If cannot generate a plan
 - If cannot establish a viable approach
 - Only if no purposeful engagement
- Differentiate between giving task–outcome expectations, and task–plan/instructions
- Prompt just enough
 - To see if they can run with the skill, or not

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WHAT IS EF TREATMENT?

- Suggesting environmental adaptations
- Developing compensatory strategies
- Teaching compensatory strategies
- Generalizing compensatory strategies
- Modeling EF skills through guided learning
- Serving as an external frontal lobe
- Teaching specific EF skills
- Educating the child & encouraging brain ownership
- Creating an EF-friendly culture
- Educating parents, teachers, administrators

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WHERE TO START?

- What is known about the diagnosis?
 - Traumatic, developmental
 - Environmental influences
 - Comorbidities
- What is the learning profile for that diagnosis?
 - Language
 - Social
 - Emotional
 - Cognitive
 - Motor
- How much scaffolding and supports are already in place?
- How understanding, aware, knowledgeable are the people within the child’s environment?

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PROBLEMS IN ATTENTION

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DIRECT ATTENTION TRAINING

- ▶ Direct process-specific training
 - *Pay Attention! Attention Training for Children Ages 4–10*, Thomson, J. & Kerns, K.
- ▶ Tasks:
 - Sustained Attention Tasks
 - Visual sort, search,
 - Auditory scan, search
 - Selective Attention Tasks
 - Visual distractors challenge sustained attention
 - Auditory distractors challenge sustained attention
 - Alternating Attention Tasks
 - Search A, search B; Sort A, sort B, multi-features
 - Auditory scanning for two targets; switch
 - Divided Attention Tasks
 - Sort, multi-rules; auditory scan, multi-rules

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ATTENTION-CUEING LANGUAGE

- ▶ Prompt awareness of need to attend
- ▶ Prompt readiness to attend
 - *Where are we?*
 - *What is happening?*
 - *Are you ready?*
 - *What do we need to do?*
 - *What did she just say?*
 - *What did I just say?*
 - *What is going on here*
 - *I'm going to say something now*
 - *Get ready*
 - *Look at me*
 - *Look at this*
 - *I need your brain to work*
 - *It's your brain's turn to exercise*

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ATTENTION-FRIENDLY EFFORTS

- ▶ Get the message in
 - ▶ Repeat as needed
 - ▶ Restate to allow for processing
- ▶ Confirm understanding before initiating
 - ▶ Request immediate recall, explanation of task before beginning
- ▶ Use rehearsal to promote retention
 - ▶ Now you tell me
 - ▶ What do we do?
- ▶ Minimize # of input-channels
 - ▶ Verbal only (instructions, not worksheet)
 - ▶ Visual only (worksheet, not verbal instructions)
- ▶ Control distractors
 - ▶ Eliminate unnecessary stimuli
 - ▶ Minimize environmental "noise"

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TEACH MINDFULNESS

- ▶ Being "present"
- ▶ Grounding in the moment
- ▶ Actively engaging more than "just" auditory listening
- ▶ Using body:
 - Turn towards input
 - Quiet other movements, if possible
- ▶ Using eyes:
 - Watching for important cues, markers, signs
 - Watching eye-gaze for important insight
 - Watching body-movement for important clues
- ▶ Using mouth:
 - Close it while someone else talks

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GET AWARENESS

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SELF REGULATION & AWARENESS

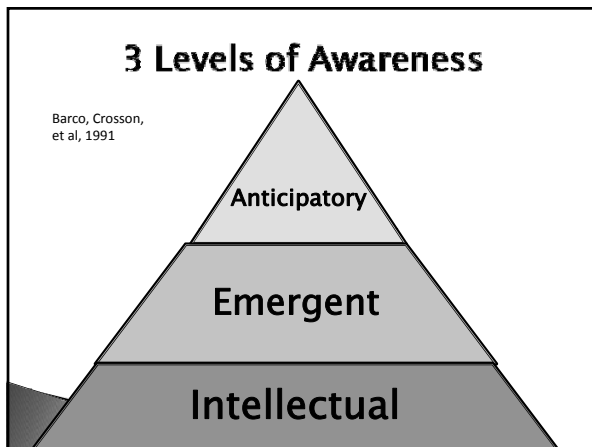
- ▶ Self regulation
 - Is dependent upon Awareness
 - Is only as good as one's cognitive "presence"
 - Is only as consistent as the reliability of awareness
- ▶ Ability to regulate one's self does not become internalized without sufficient awareness
 - To monitor
 - To note problems
 - To compare performance w/requirements
 - To ID need to shift, stop, re-group

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WITHOUT AWARENESS....

- ▶ Major questions here....
 - Who regulates the individual?
 - Who recognizes the need to act, stop, start, wait, re-group, etc?
 - How does the individual use strategies?
 - How does the individual generalize?
 - Who manages the environment?
 - Who minimizes risk?
 - Who organizes ideas and efforts?

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1. INTELLECTUAL AWARENESS

- ▶ *"cognitive capacity to understand to some degree that a ..function is diminished from premorbid levels"* (Barco et al., p. 131)
- ▶ 3 degrees:
 - Initial level – Basic idea that some trouble exists with specific situations
 - Higher level – Begin to see that these specific situations have something in common.... Relies on INTEGRATION
 - Highest level – Finally, *recognize implications of deficits*. Relies on conclusions, memory
- ▶ But sees no reason to compensate, & sees no resulting problem(s)
- ▶ Clinical implications?

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2. EMERGENT AWARENESS

"ability to recognize problem when it is actually occurring..." (Barco et al, p. 132)

- Recognition of PROBLEMS which are CAUSED BY a deficit
- Cannot GET Emergent Awareness, if you do not have Intellectual Awareness
- Assumes enough Intellectual Awareness to recognize problems without undue/excessive prompting from others
- Is the LINK between "yes, a deficit, but it causes no trouble for me" and "OH!! This is a huge problem!"

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3. ANTICIPATORY AWARENESS

- ▶ *"Ability to anticipate that a PROBLEM is going to occur because of a DEFICIT"* (Barco, et al, p. 132)
- ▶ Assumes that you are able to anticipate your own problems without cues from others
- ▶ Means that YOU understand the implications of your deficits....
- ▶ Allows you to have some degree of control over future events
 - Minimize risk
 - Increase chance of successful efforts solving problems
 - Carry out functional interactions, tasks
 - Have academic success, communicative succes
 - Develop pre-vocational skill-set

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BRAIN OWNERSHIP MANUAL

- Talk about the brain!
- Make thinking concrete
- Label thinking as it occurs
- Label problems as they occur
- Talk about brain exercise
- BRAIN GYM
- BRAIN ENGINEER

- Give feedback that problems exist.
- Allow failure

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FAILURE AND FEEDBACK

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DEFICITS CAUSE *PROBLEMS*

- Link real-world problems to underlying deficits
- Label the problem
 - Got lost in store
 - Failed math test
 - No science books at home for homework
- Link the problem to an underlying deficit
 - Inattention, wandered off
 - Inattention, didn't fill in last page
 - No future-planning, didn't talk through needed items
- Label the failed outcome, WHEN it occurs:
 - "Unsafe"
 - "Incomplete"
 - "Unexpected"

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WHY ALLOW FAILURE?

- If you intervene, you are PREVENTING the failure
 - Which prevents a learning opportunity
- Failure offers opportunity to acquire awareness....
 - Within reason for tolerance, confidence
 - Within reason for cognitive ability
 - Within reason for safety

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RULES FOR FAILURE

- Have proof
- Be visual
- Be specific
- Be immediate
- Capture the moment
- Freeze time
- Repeat, rephrase
- Require confirmation

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SABOTAGE

- DON'T
 - Give/do/plan everything for the client in therapy
 - Jump in the moment you see something begin to fall apart
 - Rush in to fix an unexpected problem
 - Control the environment to the extent there are no reasonable challenges
 - Work ONLY in controlled environments forever in therapy
- DO:
 - Provide requirements
 - Provide tools & opportunities
 - Provoke thinking
 - Get AH-HAHI moments

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HOW TO FREEZE THE MOMENT

- ▶ Self-awareness must be built in the moment
 - Capture the moment
 - Stop time, point out behavior
- ▶ Ask pointed questions
 - What is in your hand?
 - What are you doing right now?
 - What is happening?
 - Is this what you intended?
 - Is this working?
 - Should you continue?
- ▶ Follow up questions
 - So, how did this go?
 - Did you need help?
 - Did you have any trouble?



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WHAT DOES FAILURE LOOK LIKE?

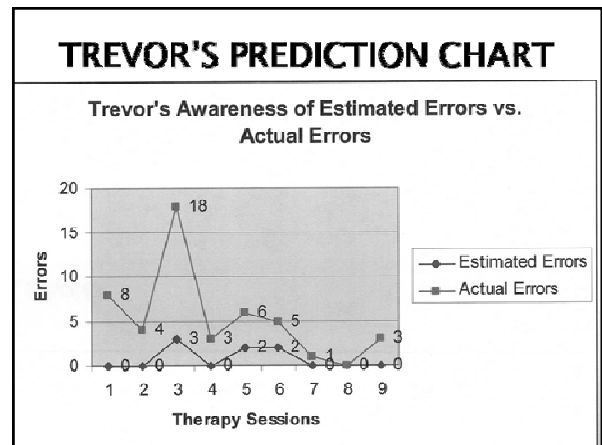
- ▶ Constantly link behavior to outcomes
- ▶ Verbal labels
 - “Unsafe”
 - “Unexpected”
 - “Incomplete”
 - “Irrelevant”
- ▶ Show visual representations
 - Use graphs to track insight, attempts, failures, accuracies in predicting need for help
 - Use video-feedback
- ▶ Preserve insight
 - Commit to paper before is forgotten or diminished

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PREDICTION GRAPHS

- ▶ How many errors (problems) do you think you will have?
 - Get prediction on record
 - Proceed with task as they plan
 - Allow failure or natural consequences
 - Stop at moment of failure
 - Ask them to evaluate
 - OR, stop after complete
 - YOU evaluate
- ▶ Compare actual outcome with prediction
- ▶ Require thought time about discrepancy
- ▶ May have to do repeatedly

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SELF COMPENSATION

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WHO HELPS?

- ▶ Someone else, until you have awareness, insight, and perception of needing help
- ▶ No point in expecting strategy-use until:
 - Can recognize problems
 - Can identify errors/deficits when they occur
 - Can link errors/deficits to problems
 - Can predict WHEN they'll need to compensate
 - Can recognize HOW they'll need to compensate

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- ▶ This is the key point.
- ▶ You cannot self-correct what you do not see.
- ▶ You cannot use a compensatory strategy for something you do not recognize.

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COMPENSATORY STRATEGIES

- ▶ Compensation assumes:
 - ▶ Can ID errors
 - ▶ Can recognize deficits
 - ▶ Strategies are preventative in nature
 - ▶ Used because a problem is *anticipated*
 - ▶ Used because of desire to avoid the problem
- ▶ Anticipation requires:
 - ▶ Prediction of outcomes, consequences
 - ▶ Planning ahead
 - ▶ Linking past experience/knowledge with present
 - ▶ Linking past experience/knowledge to future
 - ▶ *If..... Then* language

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STRATEGY USE

- ▶ Build your strategies, whatever they may be
 - ▶ *Self-talk*
 - ▶ *Double-check*
 - ▶ *Organized scanning*
 - ▶ *Work-log*
 - ▶ *Planners*
 - ▶ *Question-asking/clarifying*
- ▶ Teach the strategy
- ▶ Teach reason for strategy (awareness)
- ▶ ID moment strategy is needed (awareness)
- ▶ ID which strategy to use
- ▶ Get successful USE of that strategy
- ▶ Show difference in performance with, and without, strategy
- ▶ FADE supervision of strategy-use
- ▶ Generalize

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USE LANGUAGE

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VERBAL STATEMENTS TO GET IN THE MOMENT

- ▶ Label Physical Actions
 - ▶ "You're looking at her while she talks."
 - ▶ "Your hands are quiet while you think."
 - ▶ "Nice job thinking before you use your hands."
 - ▶ "Your face is saying you're angry."
 - ▶ "Your voice tells me you're frustrated."
- ▶ Label Mental Actions
 - ▶ YOUR brain did THAT!!"
 - ▶ "What good concentration!"
 - ▶ "You're exercising your brain."
 - ▶ "What a good plan your brain thought up."
 - ▶ "Your brain is working on an idea."
 - ▶ "Good—you made a list of what we need."

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LANGUAGE AS A TOOL

- ▶ Language must be sufficient for:
 - ▶ Thinking
 - ▶ Reasoning
 - ▶ Comparing
 - ▶ Predicting
 - ▶ Concluding
 - ▶ Anticipating
 - ▶ Self-regulation
 - ▶ Self-planning
 - ▶ Self-organizing
 - ▶ Self-directing
- ▶ THINKING VERBS
 - Know
 - Think
 - Feel
 - Need
 - Want
 - Must
 - Might
 - Will

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THINKING LANGUAGE

- › Clear thinking is deliberate, concrete, useful
- › Specific thinking causes specific outcomes
- › Language reflects thinking
- › Language should be:
 - › Deliberate
 - › Intentional
 - › Descriptively accurate
 - › Actively specific

What do you WANT from me??????????

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THINKING LANGUAGE

- › Direct
 - Do THIS.
 - Do THAT.
 - Give me THIS.
 - Give me THAT.

- › Implied
 - My hands are full.
 - Someone's there.
 - I like it, too.
 - I can't reach it.

What do you MEAN!?!?
What is the PLAN!?!?
What should I DO?
What is he DOING?

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SYNTAX, LOGIC, & PREDICTION

- › We cannot predict without logic
- › We need syntax to
 - Support logic, future-thinking, and past-evaluation
- › Important syntax/grammatical structures:
 - If...then (cause and effect)
 - Active/passive sentences (who does what to whom?)
 - Conjunctive adverbs (conditional cause and effect)
 - *However,*
 - *Consequently,*
 - *Therefore,*
 - *Even though,*
 - *Finally*
 - *Conversely*
 - Conditionals:
 - *All, none, some*
 - *Sometimes, always, never*

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SEMANTICS & VERBAL REASONING

- › We cannot reason without semantics
- › We need semantics to:
 - Define, describe
 - Classify, categorize
 - Compare, discriminate
 - Reason, determine
- › We need verbal reasoning to:
 - PREDICT
 - ANTICIPATE
 - CHOOSE
 - STRATEGIZE

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LANGUAGE & MONITORING

- › SELF TALK.....
 - We need language for Inner Speech
 - We need inner speech to support metacognitive control
- › Such as:
 - Self-prompting for action
 - Self-inhibiting for waiting
 - Self-comparison for deciding consequences
 - Self-supporting memory, task-completion
 - Self-supporting for organizing, planning
- › Model self talk!
- › Talk out loud!
- › Be a verbal coach!
- › Think thoughts aloud!
- › Problem-solve aloud!

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TEACH SELF-TALK

RULES

- › Short and sweet
- › Mantra
- › Say it for them at moment needed
- › Until they can say themselves
- › What do you need to do?

EXAMPLES

- › *Stop, think, plan, do*
- › *I need help*
- › *What's next*
- › *Plan first*
- › *Good or bad*
- › *What's wrong*
- › *Write it down*
- › *Do this, or that*

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MAKE SELF-TALK PORTABLE

- › Key rings
- › Checklists
- › Cue cards
- › White boards
- › Tally marks
- › Check marks
- › Cross out when done
- › Color coded prompts



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MAKE THINKING TANGIBLE

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TALK ABOUT THE BRAIN

- › Thinking about thinking
- › Brain gym
- › Brain user's manual
- › Brain owner's manual
- › Brain analysis
- › Skill-set, strengths & weaknesses
- › Learning & mastering
- › Give the brain a work-out
- › Exercise your thinking
- › Control your thinking
- › Use words to think, plan, reason, anticipate



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COACH AND MODEL

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MENTOR, COACH, TEACH

- › Develop an EF curriculum
- › Get an EF curriculum
- › Model EF skills
- › Talk out loud as you use EF skills
- › DO things in unison which require EF skills
- › Get charts, set goals, show accomplishments
- › Dawson, P. & Guare, R. (1998). *Coaching the ADHD Student*. North Tonawanda, NY: MultiHealth Systems.
- › Rush Neurobehavioral Center—Chicago, IL. *Programs for Schools. Teacher/Educator Workshops. EF Curriculum*
 - <http://www.rnbc.org/education/a-focus-on-executive-function/>
- › Dawson, P. & Guare, R. (2009). *Smart but Scattered*. NY: Guilford Press.
- › Meltzer, L. (2010). *Promoting Executive Function in the Classroom*. NY.: Guilford Press

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SCAFFOLD THINKING

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AVOID SIMPLY TELLING.....

- ▶ The goal in EF therapy is NOT to “get” the child to finish the task, or get the right answer, or say what you want them to say
- ▶ The GOAL in EF therapy is to promote thinking skills within the child him/herself.
- ▶ Need to scaffold thinking.
- ▶ IS MORE TIME CONSUMING

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SOCRATIC QUESTIONING

- ▶ The idea that your questions promote a specific type of thinking, or insight
- ▶ The child’s thinking process then promotes a specific type of mental action, or response
- ▶ The response you get from the child is designed to get them to “independently” think to the next step
- ▶ Your goal is to say or ask something which prompts a thought–response chain, which results in use of plan–initiate–execute

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CUEING HIERARCHY EXAMPLE

1. Ask general question about quality of work.
 - *“Is there anything wrong with your plan?”*
2. State the general presence of errors in the work.
 - *“Well, there IS/ARE some problems; can you find them?”*
3. State the type of errors in the work.
 - *“Your plan is missing some steps/details.” OR*
 - *“Everything is here, but your words don’t make sense.”*
4. Quantify the number of each type of error present in the work.
 - *“There are _____ steps/details missing in your plan.” OR*
 - *“I can’t understand what you mean in _____ steps of the plan.”*

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CUEING HIERARCHY, CONT'D

5. Tell exactly where the problem is, and what type of problem it is.
 - *“Something is missing after #_____.”*
 - *“Something is missing in #_____.”*
 - *“Number_____ isn’t clear.”*
6. Show the client where the problem is.
 - *“This is what is wrong.”*
7. Require client to fix stated problem.
 - *“You need to _____.”*
 - *assumes no independent error fixing*

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DO STUFF!

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DISCOVERY LEARNING

- ▶ Inquiry–based instruction
 - In problem–solving situations
 - Rely on previous experience and knowledge
 - To manipulate novel circumstances and materials
- ▶ BUT, should not be a willy–nilly process...
 - Need to provide opportunities which target a specific type of EF skill in deficit
 - Place an emphasis on labeling the thought processes involved in the targeted skill
- ▶ It’s about allowing a task to unfold and then “discovering” the problem together, commenting on one’s EF skill, identifying it and grasping the need for effort, practice

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CHOOSE TASKS, THINGS TO DO

- ▶ Task requirements:
 - Inherently motivating
 - Interest level
 - Within zone of proximal development
 - Challenging but a chance of solvability
 - Manipulative and hands-on use of stuff
 - Safe
 - Require reasoning, deduction, conclusions, predictions
 - Require self-planning

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Give Tasks

- ▶ Give requirements,
- ▶ Not the “how-to”

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TASK IDEAS

- ▶ www.pbskids.org
- ▶ Junk Drawer Disaster
- ▶ Let's Run Errands
- ▶ Delivery Guy
- ▶ Emergency!
- ▶ Trail Mix—feed the people
- ▶ Time to go to Work
- ▶ Save the Water Balloons
- ▶ Flinker

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INHIBIT

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GET CONTROL

- ▶ Require/Impose delay
 - Insert pause/silence
 - Insert verbal plan/self-talk
 - Require verbal statements of intent first
- ▶ Remove and Control Materials
 - Require verbal plan/self-talk first
 - Then give materials
- ▶ Gradually increase length of delay
- ▶ Model and infuse self-talk
- ▶ Eventually, turn over control of materials to child



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WORDS FOR INHIBITION

- ▶ (SEE SELF TALK)
- ▶ Model:
 - *What's your plan?*
 - *You can't go til you tell me the plan.*
 - *What is the goal?*
 - *What are you trying to do?*
 - *What are you doing right now?*
 - *Let's write down the plan first*
 - *Wait. There's no plan.*
 - *You're interrupting. Remember we're practicing waiting.*

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WORDS FOR INHIBITION

(SEE SELF-TALK)

- *What's my plan?*
- *I need help.*
- *I don't know.*
- *It's not my turn yet.*
- *Wait! What will happen if_____?*

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WORDS FOR INHIBITION

STOP

THINK

PLAN

DO/SAY

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HAVE A PURPOSE AND A PLAN

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QUESTIONS TO PROMOTE GOAL-AWARENESS

- › What are you doing?
- › Why are you doing this?
- › What will this accomplish?
- › Why do you think this will work?
- › What will happen if...?
- › Does this plan match our goal
- › Have you done this before?
- › What does our goal require? Need?
- › What is the goal again anyway?
- › What is key? What is important?
- › YOUR BRAIN IS IN CHARGE

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GET MOTIVATION

- › A NOTE ABOUT VERBAL PROBLEM SOLVING
- › Need to find inherent motivation
- › Offer real problems, tasks, or jobs
 - › Require navigation of unstructured, or unexpected situations and environments
 - › Require navigation of deliberate sabotage
 - › Wrong stuff
 - › Not enough stuff

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TEACH GOAL SELECTION

- › Actual problem solving-creation
 - › Provide situation which requires determination of plan or intent
 - Provide opportunities to establish a goal
 - Provide opportunities to establish a plan
 - Provide opportunities to anticipate outcomes
 - Provide opportunities to execute plans and observe actual outcomes
- › Or, actual problem solving in situ
 - › Use homework, assignments, chores
 - › Repeat above, step-wise, capturing data throughout

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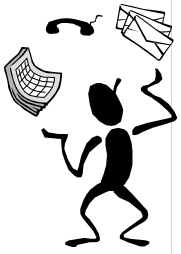
STRATEGIC PLANNING

- ▶ Promote deliberate plan-selection
 - Avoid luck, trial-and-error, or haphazard choosing
 - Require rationale for suggested plan
 - Require defense of suggested plan
- ▶ Improve prediction abilities
 - Require prediction of outcome for each plan
 - Commit any/all plans to paper
 - Measure actual outcomes vs. predicted outcomes
- ▶ Prompt use of thinking vocabulary
- ▶ Prompt use of reasoning syntax
 - If...then
 - Should....could

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TEACH STRATEGIC PLANNING

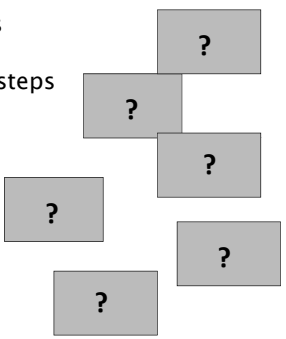
- ▶ To plan /S the desired outcome
 - Require plan-generation
 - Require analysis of plan-options
 - Require selection of viable plans
- ▶ Don't worry about
 - Execution
 - Initiation
- ▶ Capitalize on language
 - State the plan
 - Write the plan
- ▶ Sequence the plan
 - Sort steps, one per index card
 - Moveable steps!
- ▶ Try out logic, prediction
 - What ifs?



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PLANNING PIECES

- ▶ Tangible plan-steps
- ▶ Movable plan-steps
- ▶ Arrange-able plan-steps
- ▶ Discuss plan-steps
- ▶ Execute plan-steps
- ▶ Re-evaluate
- ▶ Re-plan




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USE VERB PHRASES

- ▶ Charts and graphs and notes
- ▶ Buzzers and timers and reminders
- ▶ All fine, well, and good.

- ▶ USE VERB PHRASES
- ▶ BE SPECIFIC
- ▶ BE ACTIONABLE
- ▶ USE THINKING VOCABULARY



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PLANS HAVE CONSEQUENCES

Allow execution of chosen plan

Allow failure or natural consequences!!!

Compare outcomes with predictions


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INITIATE

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BRAIN FREEZE

- “frozen”
 - A motor inability to start, persist, complete
 - A cognitive inability to break into steps
 - *Especially if the steps are implied or assumed*
 - An inability to request help or clarification
- How to jump-start the process?
 - Cognitive plans
 - Verbal cues
 - Physical prompts
 - Printed/visual prompts



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MELT THE PROBLEM INTO BITS

- ▶ Unbundle cognitive overload
 - Sub-parts?
 - Isolated steps?
- ▶ BABY STEPS
 - Do THIS
 - Do THAT
- ▶ Break into parts

- ▶ For example:
 - Stand up.
 - Walk here.
 - Put on your boots.
 - Get your coat.
 - Put the coat on.
 - Bring your backpack.
 - Walk to the back door.
- ▶ Instead of:
 - Time to go.
 - Get ready.

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INITIATION CUES

- ▶ Physical
 - Engage gross motor
 - Light touch to elbow
 - Request eye contact
 - Be in physical space, as appropriate
- ▶ Environmental Cues
 - Cue-cards
 - Start Signs
 - Checklists
 - Laminated steps/visuals/pictures

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INITIATION CUES, CONT'D

Concepts:

- Use verb phrases
- Promote specific steps
- Never assume
- Don't imply
- Use Yes/no questions (Not open-ended)
- Praise small steps completed

Questions:

- Do you know what you need/want to do?
- Do you have a plan?
- Do you need help?
- What are you going to do?
- What do you need to do?
- Are you getting ready to do it?
- Do you need me to say it again?
- Do you understand?

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SELF-TALK FOR INITIATION

Promote language for self-help

- “I need help.”
- “Please say it again.”
- “I need more time to think.”
- “Help me get started.”
- “Do it with me first.”
- “What’s the first step?”

Is better to say SOMETHING, than to remain silent and do nothing.

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SHIFT!

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DIVERGENT REASONING

Need flexibility:


- See other options
- Meet changing demands
- Understand dual meanings
- Understand implied messages, expectations
- Comprehend others' perspectives

Dependent upon

- Divergent reasoning
- Abstract language
- Capacity to accept existence of multiple options, rather than absolutes

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▶ The Wooden Spoon Question



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FLEXIBLE THINKING IDEAS

- ▶ **Tangible:**
 - Creative use of objects
 - Generate multiple plans (quality irrelevant)
- ▶ **Task-oriented**
 - Impose unexpected demands, changes, interruptions
 - Require plan-shifting—let's do it another way!
- ▶ **Verbal**
 - Multiple meanings (verbal)
- ▶ **Visual**
 - Multiple meanings (faces)

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WHAT'S IN THE FUTURE?

Living independently?
Working independently?
Going to school independently?
Or, supervised and assisted?



Who do we manage expectations for?

- What circumstances?
- Are expectations realistic?
- Have we tried everything?



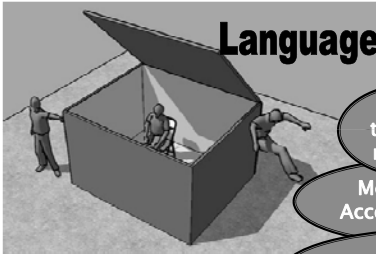
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WHAT'S IN SPEECH PATHOLOGY?



Language

- Critical thinking & reasoning
- Monitoring & Accomplishment
- Control of deliberate behavior

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Thank you,

