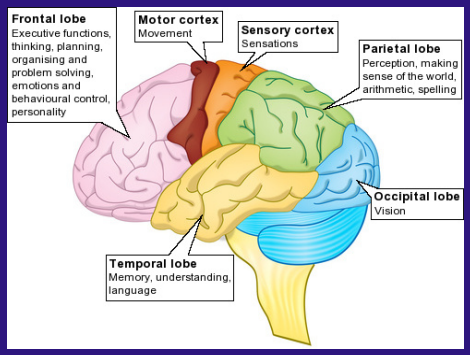
Executive Functions

The What's, Where's, and How's of It

Goals of this evening's discussion

- Discuss how EF skills impact all our lives
- Define executive functions (EF)
- Describe difficulties in school when one struggles with EF
- Determine strategies to help a child struggling with EF issues

Planning for Thanksgiving



www.headway.org.uk

EF = DIPC²

Executive Function = D I P C²

- Directing
- Integrating
- Cueing
- Coordinating
- Prompting

McCloskey's 32 Self-Regulatory Skills (2008)

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

EF Clusters

- Attention – "What's going on out there?"
- Engagement – "Get to it… or not"
- Optimization – "How am I doing?"
- Solution – "I'm the decider"
- Efficiency – "The Smooth Operator"
- Memory – "You can get there from here"

McCloskey, Ph.D., George. "Executive Functions." Assessment & Interventions for Executive Functions Difficulties Part 1. Cape Cod Institute. Nauset Regional High School, Eastham, MA. 16 July 2012. Lecture.

Attention Cluster	Engagement Cluster	Optimization Cluster	Solution Cluster	Efficiency Cluster	Memory Cluster
Perceive	Attention	Attention	Gauge	Sense Time	Attention
Focus	Energize	Modulate	Anticipate	Pace	Hold
Sustain	Initiate	Balance	Estimate Time	Sequence	Manipulate
	Inhibit	Monitor	Analyze	Execute	Store
	Stop/Interrupt	Correct	Generate		Retrieve
	Flexible		Associate		Optimization
	Shift		Plan		
	Optimization		Organize		
			Memory		
			Evaluate		
			Compare		
			Choose/Decide		
			Optimization		

EF @ Thanksgiving

- How will you prepare the meal to serve on time?
- How will you know how to set the table?
- What would happen if your oven breaks Thanksgiving morning?
- What can you prepare in advance of Thanksgiving day?

- Perceive, plan, choose, gauge, initiate, execute, pace, sense time
- retrieve
- shift, flexible, retrieve, choose, initiate
- gauge, sense time

EF @ Thanksgiving

- You cut your finger while chopping vegetables when company has already arrived. What keeps you from yelling "#**#!#%#!!!"?
- Your mother is trying to have a serious conversation with you, but you hear cheers from the football crowd in the other room. You are able to still listen to your mother. How so?
- Your father-in-law raises his glass to make a toast. All conversations around the table stop and everyone raises their glass. Why?
- You accidentally bump into someone and spill red wine over them, and you apologize profusely. Why?

- Inhibit
- Focus, sustain
- Perceive, modulate
- Perceive, monitor, correct

"Being able to focus, hold, and work with information in mind, filter distractions, and switch gears is like having an air traffic control system at a busy airport to manage the arrivals and departures of dozens of planes on multiple runways." In the brain, this air traffic control mechanism is called executive functioning…"

- Center on the Developing Child at Harvard University (2011). Building the Brain's "Air Traffic Control" System: How Early Experiences Shape the Development of Executive Function: Working Paper No. 11

Variability within EF self-regulatory skills

- Skill competency varies within individuals
  - Proficiency in 1 or more of the 32 skills does not indicate proficiency across the board
  - Deficits in 1 or more of the skills do not suggest deficits in all the skills
- Skill development can progress at different rates, especially when taught effective strategies

McCloskey, Ph.D., George. "The Role of Executive Function in Childhood Learning and Behavior." NEALS Annual Conference. NorthEast Association for Learning Specialists (NEALS). The Forman School, Litchfield, CT. 26 Apr. 2012. Lecture.

"Unfortunately, all evidence of your son's intelligence is purely anecdotal."

Haefeli, W. (n.d.). "Unfortunately, all evidence of your son's intelligence is purely anecdotal." - New Yorker Cartoon Poster Print by William Haefeli at the Cond\© Nast Collection. *New Yorker Cartoons, Cover Art Prints & Posters - The Cond\© Nast Collection.*

If he's so smart, what's his problem?

- Is he…
  - Lazy?
  - Irresponsible?
  - Apathetic?
  - Oppositional?
  - Stubborn?
  - Passive-aggressive?
  - All of the above?

CAUTION:

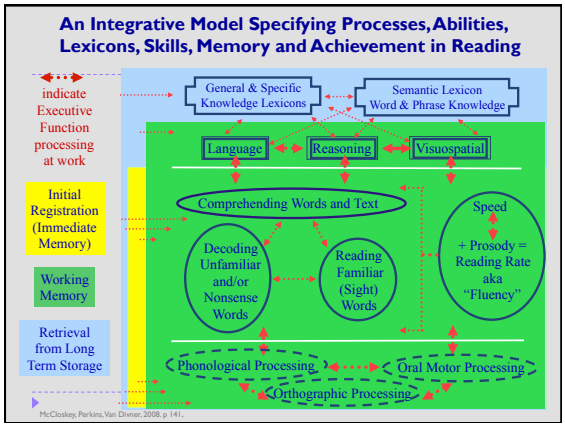
This is not about the character of a child, but about the child's inability to PRODUCE on demand.

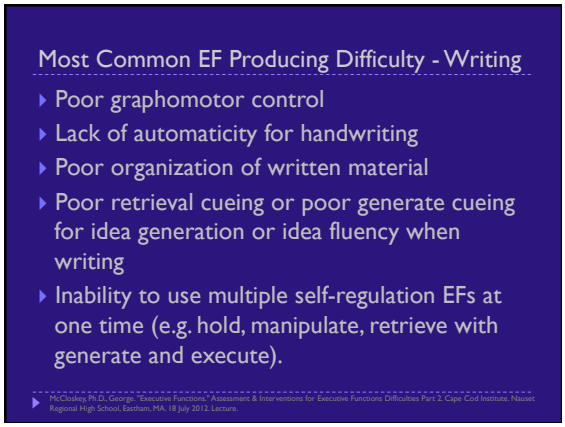
What is production?

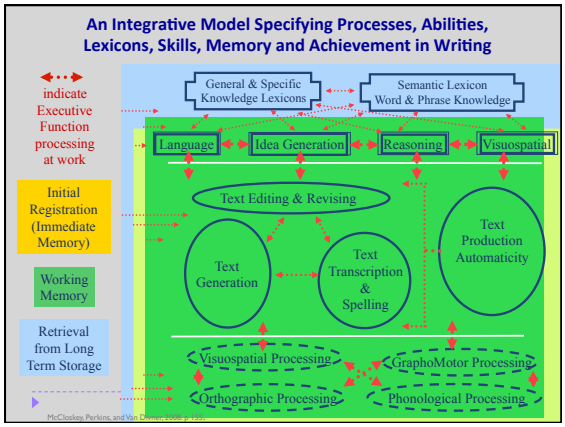
- Simply stated: ability to get the work done
- But what does that involve?
  - Recognizing the work required
  - Understanding expectations
  - Doing the work
  - Adhering to deadlines
  - Meeting expectations
  - Presenting the work

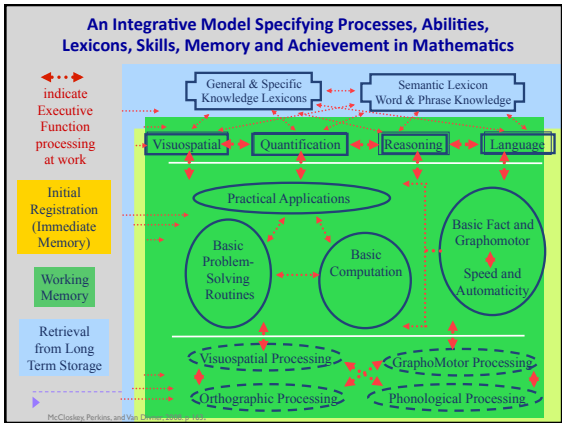
Could there be a disconnect in…

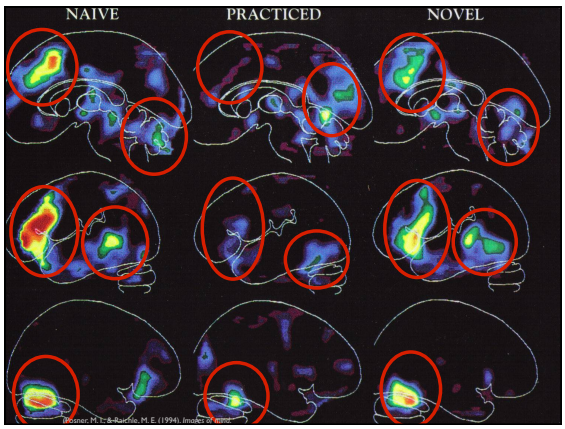
- Recognizing the work required?
- Understanding expectations?
- Doing the work?
- Adhering to deadlines?
- Meeting expectations?
- Turning in the completed work?

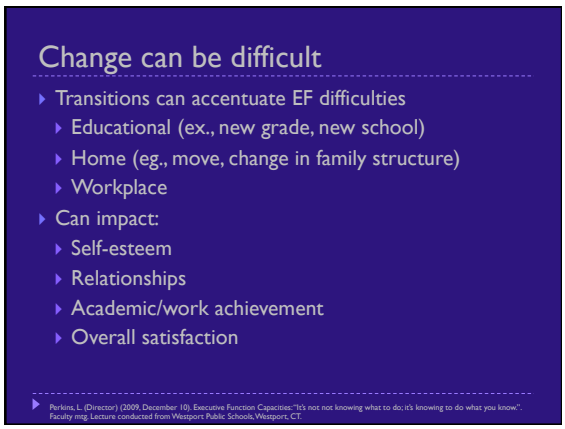

An Integrative Model Specifying Processes, Abilities, Lexicons, Skills, Memory and Achievement in Reading
indicate Executive Function processing at work
General & Specific Knowledge Lexicons
Semantic Lexicon Word & Phrase Knowledge
Language
Reasoning
Visuospatial
Initial Registration (Immediate Memory)
Comprehending Words and Text
Speed
Working Memory
Decoding Unfamiliar and/or Nonsense Words
Reading Familiar (Sight) Words
+ Prosody = Reading Rate aka "Fluency"
Retrieval from Long Term Storage
Phonological Processing
Oral Motor Processing
Orthographic Processing
McCloskey, Perkins, Van Divner, 2008. p 141.


Most Common EF Producing Difficulty - Writing
Poor graphomotor control
Lack of automaticity for handwriting
Poor organization of written material
Poor retrieval cueing or poor generate cueing for idea generation or idea fluency when writing
Inability to use multiple self-regulation EFs at one time (e.g. hold, manipulate, retrieve with generate and execute).
McCloskey, Ph.D., George. "Executive Functions." Assessment & Interventions for Executive Functions Difficulties Part 2. Cape Cod Institute. Nauset Regional High School, Eastham, MA. 18 July 2012. Lecture.


An Integrative Model Specifying Processes, Abilities, Lexicons, Skills, Memory and Achievement in Writing
indicate Executive Function processing at work
General & Specific Knowledge Lexicons
Semantic Lexicon Word & Phrase Knowledge
Language
Idea Generation
Reasoning
Visuospatial
Initial Registration (Immediate Memory)
Text Editing & Revising
Working Memory
Text Generation
Text Transcription & Spelling
Text Production Automaticity
Retrieval from Long Term Storage
Visuospatial Processing
GraphoMotor Processing
Orthographic Processing
Phonological Processing


An Integrative Model Specifying Processes, Abilities, Lexicons, Skills, Memory and Achievement in Mathematics
indicate Executive Function processing at work
General & Specific Knowledge Lexicons
Semantic Lexicon Word & Phrase Knowledge
Visuospatial
Quantification
Reasoning
Language
Initial Registration (Immediate Memory)
Practical Applications
Working Memory
Basic Problem-Solving Routines
Basic Computation
Basic Fact and Graphomotor
Speed and Automaticity
Retrieval from Long Term Storage
Visuospatial Processing
GraphoMotor Processing
Orthographic Processing
Phonological Processing


NAIVE
PRACTICED
NOVEL


Change can be difficult
Transitions can accentuate EF difficulties
Educational (ex., new grade, new school)
Home (eg., move, change in family structure)
Workplace
Can impact:
Self-esteem
Relationships
Academic/work achievement
Overall satisfaction
Perkins, L. (Director) (2009, December 10). Executive Function Capacities: "It's not not knowing what to do; it's knowing to do what you know.". Faculty mtg. Lecture conducted from Westport Public Schools, Westport, CT.

BUT…CHANGE IS POSSIBLE!

- Student: "Am I going to be like this forever?"
- Our Response: "Not forever…just longer than you'd like."
- Over time, with intervention, change can happen!!!

McCloskey, Ph.D., George. "Executive Functions." Assessment & Interventions for Executive Functions Difficulties Part 1. Cape Cod Institute. Nauset Regional High School, Eastham, MA. 16 July 2012. Lecture.

Interventions

- Delicate balance between helping them when they need it and helping them develop the strategies so that they can be independent
- Remember: the goal is for students to utilize these self-regulatory skills on their own (thus the name, self-regulatory)

Perkins, L. (Director) (2009, December 10). Executive Function Capacities: "It's not not knowing what to do; it's knowing to do what you know.". Faculty mtg. Lecture conducted from Westport Public Schools, Westport, CT.

Strategies for home intervention

- Provide predictable, consistent structure to home environments and routines
  - Organizational systems
    - Rules of the house
    - Schedule of activities, upcoming events, responsibilities
    - Study spaces
    - Filing systems
  - Maintain a positive problem-solving mode

Perkins, L. (Director) (2009, December 10). Executive Function Capacities: "It's not not knowing what to do; it's knowing to do what you know.". Faculty mtg. Lecture conducted from Westport Public Schools, Westport, CT.

Supporting Development of Self-Regulation Skills

- Model and encourage the use of internalized "self-talk" for task initiation, planning, organization and completion.
- Teach use of self-administered reward routines ("If I get my math homework done in 30 minutes, I will treat myself to ….")
- Use behavior reward plans—only if the skills are in place to demonstrate. The plan won't be effective if the child does not have the executive skills you are trying to reinforce.
- Develop a common vocabulary and/or visual signals for use of needed self-regulation capacities.
  - "Read the room" "What's your plan?"
  - "Start" "Stop" "Time to make a shift"
  - "Check and correct" "Would you like a do-over?"
  - "How much time do you need to get this done?"

Perkins, L. (Director) (2009, December 10). Executive Function Capacities: "It's not not knowing what to do; it's knowing to do what you know.". Faculty mtg. Lecture conducted from Westport Public Schools, Westport, CT.

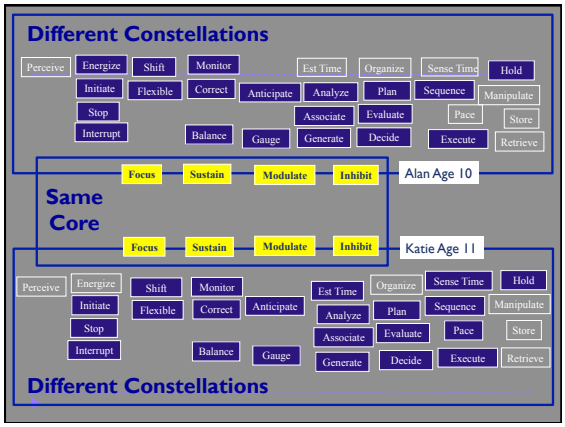
Supporting Development of Self-Regulation Skills

- Providing students with feedback about their performance enables them to engage executive capacities more effectively to learn from their mistakes and improve future performance
- Verbal Mediation
  - Use of verbal cues and questions to guide thinking processes
  - Relating and discussing social stories to provide basis for models of appropriate behavior

McCloskey, G (Director) (2012, April 26). The Role of Executive Function in Childhood Learning and Behavior. *NEALS Annual Conference.* Lecture conducted from NorthEast Association for Learning Specialists (NEALS), Litchfield, CT.

Parting Thoughts

- No time like the present - take advantage of the opportunities to model in the next few weeks as you plan for the Thanksgiving holiday
  - Involve them in the process – it will be good practice for them ☺
- Enjoy!


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