


Slide
1



Cognitive, Executive, Emotional,
and Behavioral Interventions for
students.
Designing interventions that work!

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Slide
2

Goals

- A whole-child centered approach is used to:
 - improve children's functioning
 - build skills
 - develop strategies to promote learning and independence
- This lecture will review the essential systems for learning including cognitive, executive, emotional, and behavioral aspects of students' functioning.
- Participants will learn how to approach designing interventions as well as understand specific strategies that work in classrooms.

Slide
3

Intervention Background

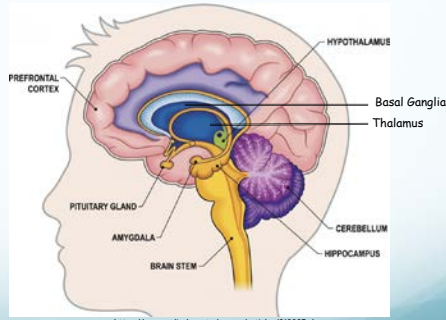
- Brain structure and function
- Learning Domains
- Executive Skills

Slide

4

Brain & Learning Domains

- Cognitive System
- Executive System
- Emotional System
- Behavioral System



<https://www.medicalnewstoday.com/articles/313295.php>

Slide

5

Learning Domains

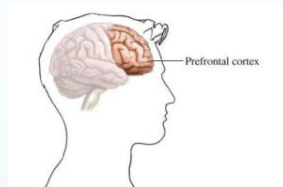
- The Academic Learning Domain
 - Cognitive: Gaining new information, attaching it to old information, showing what you know.
- The Control Domain
 - Executive – manages all other systems
- Support Domain
 - Emotional – sets up learning
 - Behavioral – encourages or discourages learning

Slide

6

Executive System

- Control and organization for all learning systems
- Skills Include
 - Organization/Planning
 - Flexibility
 - Initiation/ Problem Solving
 - Working Memory
 - Metacognition
 - Emotional Control
 - Behavioral Control
 - Inhibition/Regulation



<https://nervoustalk.wordpress.com/2014/07/10/cancer-that-causes-pedophilia/>

Slide

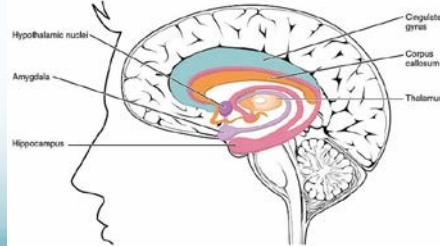
7

Emotional System

- Heavily tied to learning
- Controlled by the frontal lobe
- Stability creates and openness for learning

Emotion

- Basic Emotional State - Stability
- Depressive Symptoms
- Anxious Symptoms
- Curiosity & Motivation
- Avoidance/Fear



Slide

8

Behavioral System

Encourages Learning

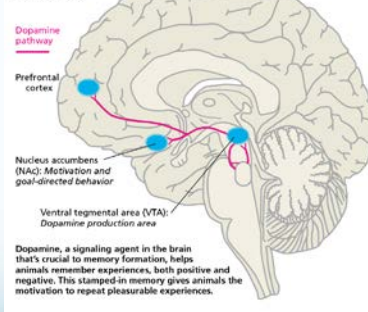
- Reward = start or continue

Discourages Learning

- Punishment = stop

Rewards can increase learning and stimulate frontal lobe of the brain leading to more brain power!

Reward Pathway in the Brain



<http://discovermagazine.com/2015/may/17/resetting-the-addictive-brain>

Slide

9

What makes learning happen?

- Connections between cognitive system, executive system, emotional system, and behavioral system
- Executive System in frontal lobe controls all systems
- Emotional system enhances learning by creating a saliency factor
- Behavioral system contributes to learning through reinforcement and punishment
- **All systems must be stable, efficient, and effective for learning (SEE learning!)**

Slide
10

System Stability

- Cognitive System
 - Gaining academic information, attaching it to old information, showing what you know.
- Executive System – CONTROL
 - Organization, Planning, Problem Solving
 - Emotion management
 - Behavioral Control
 - Only has so much power!
- Emotional System
 - Basic stability, salience factor for learning
 - Can drain executive power
- Behavioral System
 - Rewards, punishment, learning support
 - Uses emotion to enhance learning

Slide
11

Tourette and System Stability & Environment

<https://www.dealwithautism.com/tourette-syndrome-symptoms-treatment-for-tourettes/>

Slide
12

How to help

Designing Interventions that Work!

Slide
13

Designing Academic Intervention Programing

- ✿ 1. What **systems** are impacted and are they all stable?
- ✿ 2. What environmental changes must be made to help with system stability?
- ✿ 3. What system is deficient, and what **pre-requisite** skills does it take to make the system stable?
- ✿ 4. Where is the right balance of **compensation vs. remediation to support these skills** across systems?
- ✿ 5. How can we identify **goals**?
- ✿ 6. How do we teach skills **then track & monitor progress**?

Slide
14

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Slide
15

...and the pre-requisite skills?

- Target system deficits as well as the pre-requisite skill that subserve them.
- Cognitive Example: Reading
 - Pre-requisite = phonological processing
- Executive Example: Classroom learning
 - Pre-requisite = organization to access learning
- Emotional Example: Anxiety Management
 - Pre-requisite = identifying emotion, connection between thoughts, feelings, and behaviors, calm down strategy
- Behavioral Example: Attending to work
 - Pre-requisite = knowing what attending is, know what it feels like to pay attention and not, being reinforced for paying attention (i.e. learning to pay attention)

Slide
16

How do we teach pre-requisite skills?

Compensation vs. Remediation

- Compensation – accommodating or “going around” the problem (can be environmental too)

vs.

- Remediation – teaching a skill or “making it better”

Slide
17

Compensation vs. Remediation

Decision to remediate or compensate for system deficits

Slide
18

Cognitive System: Reading

- Are all other systems stable?
 - Good executive system, emotional system, and behavioral systems in place.
- Pre-requisite skills needed
 - Understanding of phonics
 - Visual tracking/scanning
 - Sustaining mental effort (i.e. attention)
 - Abstract thinking
 - Fluency/Processing speed
 - Working memory to help put story in context

Slide
19

Reading Remediation

- Phonics - Wilson Reading
- Tracking/Scanning - OT or vision therapy
- Attention - MotivAider/ self monitoring system/highlight or margin notes
- Abstract Thinking - practice predicting
- Fluency - drill and practice daily

Slide
20

Reading Compensation

- Accuracy- read material to student/ use text to speech
- Tracking/Scanning - reading window/larger print/less on page
- Attention - shorter lessons/high interest topics/movement breaks
- Abstract thinking - limit prediction questions/make material fact based
- Fluency - give extra time

Slide
21

Reading Summary

- First check all other systems
- Then consider pre-requisite skill most likely impacted
- Design academic interventions to target those skills
- Help students compensate while attempting remediate
- Track each skill as they develop and scaffold

Slide
22

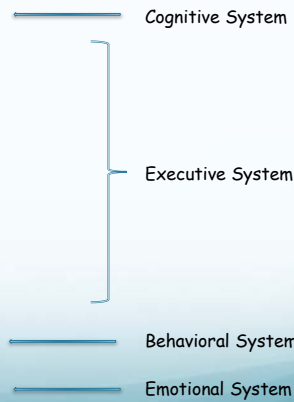
Support skills to access all learning

- Just like academic skills in the cognitive system, we need to **TEACH executive skills** to improve ability to learn and demonstrate learning
- These executive skills subserve all academics, learning, behavior and emotion management
- When goal is to acquire specific knowledge or skill (i.e. Reading, Writing, Math), compensate for executive skills. When the goal is to improve the ability to learn, focus on remediating executive skills.

Slide
23

Learning as a Domain Pre-Requisites

- Cognitive ability
- Inhibition/control
- Problem Solving/
- Initiation
- Working Memory
- Organization/Planning
- Flexibility
- Behavioral stability
- Emotional stability



Cognitive System

Executive System

Behavioral System

Emotional System

Slide
24

Executive System

CONTROL!

How to learn skills

- Focus
- Inhibition/Regulation
- Initiation/ Problem Solving
- Working Memory
- Organization/Planning
- Flexibility
- Metacognition

Slide
25

What do normal executive skills look like

- **Pre-school:** Simple errands/chores (vacuum, straighten room with help, inhibit some behaviors like touching things, too hot, don't hit, etc.)



- **Grade 1-2:** Manage time (20 minutes), complete homework, get ready for school, inhibit behaviors like talking out of turn, interrupting



Slide
26

Normal Maturation

- **Grade 6:** Chores (15-20 minutes long), clean room, babysit, use organization system, follow complex schedules, long term projects, plan time, inhibit rule breaking without cue
- **Grade 8-9:** Effectively manage work day to day, establish long term goals and plan, structure leisure time, inhibit dangerous/reckless behavior

Slide
27

How do you know if executive skill instruction is necessary?

- They look different from other kids their age.
- They are capable of the content, but can't learn without help.
- They have trouble starting assignments, but do well when monitored.
- They forget tasks and homework.
- They have trouble estimating the time projects will take.
- They have trouble problem solving when things change.

Slide
28

Executive System: Problem Solving

- Are all other systems stable?
 - Good cognitive system, emotional system, and behavioral systems in place.
- Pre-requisite skill check with interventions
- Balance compensation and remediation strategies

Slide
29

Problem Solving Pre-requisite Skill Remediation

PACT - problem solving technique

- **P**roblem
 - State the problem to be solved
 - Help frame the situation
- **A**ction
 - List ALL possible ways to solve the problem
- **C**onsequences
 - List ALL possible consequences
 - Rate the actions + or -
- **T**ry it!
 - Try one, if it doesn't work, try another!

Fulgren personal communication (2008)

Slide
30

Problem Solving Compensation

- Provide **rules** for approaching problems (say things the same way every time)
- Provide a **list of class assignments or chores** on a board (e.g. write the instructions for a task in order of completion)
- Create a book for "how to solve problems"
 - Include steps for how to approach a problem (e.g. fractions)
 - What to do if you don't know what to do!
- Give new information in **smaller units** when possible, reviewing frequently.
- **Break longer tasks/instructions** into smaller, discrete units.
- Help students **get started** on tasks and **check** periodically to see that he or she continues to follow directions.

Slide
31

Problem Solving Balance of Remediation and Compensation

- Start with cuing and then fade back to independence
 - Cuing should be consistent across settings and caregivers
 - Start with heavy cuing and transition to a look or the start of a phrase
- Teach children how to generate their own
 - Rules for approaching problems
 - List of class assignments or chores on a board
 - Method for breaking down assignments
 - Assignment check-ins

Slide
32

Emotion System: Emotion

FIGHT OR FLIGHT REACTION

Copyright © BTAN. All Rights Reserved. MENTAL PROLIFERATION

Slide
33

Emotional System Pre-requisite Skill Remediation

- Pre-requisite remediation
 - Social-emotional skill development programs
 - Teach strategies for identifying emotional triggers prior to an outburst (PREVENTION)
 - Teach “calm down” strategies for reducing emotional reaction
 - Breathing
 - Progressive muscle relaxation
 - Changing the channel on thoughts

Slide
34

Emotional System Compensation

- Create a supportive school and classroom environment
- The student or all other students leave the room when upset/emotional
- Provide **short breaks** when emotion level rises, shift to or away from whole class instruction or change activity at home to reduce expectation on the child
- Reduce environmental triggers
- Provide time and space to reduce physiologic response
- Reduce expectation when appropriate

Slide
35

Emotion Balance of Remediation and Compensation

- Teach children to identify their emotion and their emotional triggers – collect data and be a detective! (**remediation**)
 - Start by removing as many environmental triggers as possible (**compensation**) while the child is learning to identify their emotion.
 - At first, allow children to leave the room when triggered (**compensation**). Make them feel good about avoiding an outburst!
 - Once a student can identify and reduce the outburst, teach them strategies for reducing their emotional reactivity (**remediation**). Make them feel good when they try these strategies!
 - Slowly encourage them to stay in the room and expose them to triggers if necessary to allow them to practice their new skills!
- *Use "change the channel" cards for incompatible emotional response

Slide
36

Emotion Balance of Remediation and Compensation

- Tips
 - Provide time and space to reduce physiologic response during "leave the room" times
 - Reduce expectation when appropriate
 - Use the same cues!
 - Practice when emotion is reduced
 - Use cue cards to avoid extra stimulation

Slide
37

Behavioral System: Attention

- Are all other systems stable?
 - Good cognitive system, executive system, and emotional systems in place.
- Pre-requisite skill check with interventions
- Balance compensation and remediation strategies

Slide
38

Attention Pre-requisite Skill Remediation

- Self monitor - MotivAider
- Practice short, timed sustained attention
- Teach Learning checks
- Provide specific and contingent positive reinforcement for desired behaviors

Slide
39

Attention Compensation

- 15 minute rule for assignments
- Provide short breaks built in to the day
- Remind students to work carefully
- Engaging instruction
- Make sure any material not absolutely necessary to the task is removed from the desk
- Ask the student to run errands in/out of the classroom

Slide
40

Behavioral Balance of Compensation and Remediation

- Use behavioral reinforcement systems to “jump start” skills building programs, then fade them
- Reinforce each pre-requisite attentional step:
 - First – reinforce for correctly identifying when the child is and isn't paying attention (Matching teacher)
 - Next – reinforce for correctly identifying AND paying attention (Matching teacher and improving skill)
 - Finally – reinforce for paying attention while self monitoring (Improving skill independently)

Slide
41

Bringing it all together

- Balance cognitive/academic learning with "how to" skills necessary to learn including executive control & emotional and behavioral system support
- The executive system controls other systems for learning
- Emotional and behavioral systems must be stable in order for a child to learn
- Focus on the balance of compensation and remediation when teaching skills to promote independence
- Identify goals and track progress...

Slide
42

Identify Goals

- Identify and track executive, emotional, and behavioral skills to demonstrate deficits and progress toward building skill
- Use the data to ensure skill building and work toward **independent functioning**

Slide
43

Track & Monitor Progress

Subject M = Math S = Science SS = Social Studies SP = Spanish E = English F = Fluency T = 21 st Century Life & Career	Attention		Organization & Planning		Response Inhibition		Metacognition		Totals
	Did I attend to instruction?	Did I maintain my focus on my task? Can I read what I wrote?	Was I organized?	Did I take notes in the correct location? Are things in the correct spot of my binder?	Did I stop and think?	Did I maintain on topic comments? Did I stop and think before answering questions?	Did I use my strategy?	Did I use my problem solving strategy? (Color Binder)	
	Y ○○○ N	Y ○○○ N	Y ○○○ N	Y ○○○ N	Y ○○○ N	Y ○○○ N	Y ○○○ N	Y ○○○ N	
# of cues needed									

Slide
44

Tips

- Individualize Interventions
 - Ask students their interests
 - Ask students what works best
 - Ask students their perception of what is hard
 - Look at profile for strengths & weaknesses
 - Follow natural/normal routines & tendencies
- Think of strategies that generalize!
 - Natural cuing
 - Interventions in the real-world environment
 - Push-in models
- Promote independence by reducing cues (and track it!)

Slide
45

A note about intervention in schools

Identifying Goals & Teaching Skills & Tracking Progress!

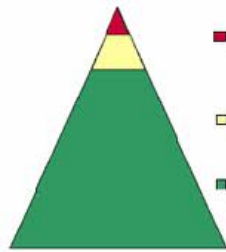


Wait...How do we do this?

Slide
46

PBS Model – current model

- Based on problem-solving model
- Aims to prevent inappropriate/maladaptive behavior through teaching and reinforcing
- Preventative structure assists students with concussions or other brain injuries



■ **Tertiary (FEW)**

- Reduce complications, intensity, severity of current cases

□ **Secondary (SOME)**

- Reduce current cases of problem behavior

■ **Primary (ALL)**

- Reduce new cases of problem behavior

OSEP Technical Assistance Center on Positive Behavioral Interventions & Supports, 2007

Slide
47

Primary Level

- Teach executive, emotional, and behavioral skills Universally!
 - Study skills curriculum
 - Add executive skill & problem solving instruction developmentally across grades
 - Encourage use of daily planners
 - Capitalize on GLEs & SGOs- Teach Powerpoint as a method of organizing thoughts
 - Create a positive school climate
 - Use Classroom Positive Behavior Support strategies!

Slide
48

Secondary Level

- Have programs to balance the systems:
 - Executive
 - Book Ends class
 - Level 2 Study Skills class
 - Check in Elective
 - Behavioral
 - Individualized behavior plans under I&RS
 - Peer buddy systems
 - Emotional
 - Peer mediation
 - Lunch bunch groups for kids with similar emotional needs
 - Clubs

Slide
49

Tertiary Level

- Individualized intervention plans that identify individualized goals

Subject	Attention		Organization & Planning		Response Inhibition		Metacognition		Totals
	Did I attend to instruction?	Was I organized?	Did I stop and think?	Did I use my strategy?					
M = Math S = Science SS = Social Studies SP = Spanish E = English F = History T = 21 st Century Life & Career	<ul style="list-style-type: none"> Did I maintain my focus on my task? Can I read what I wrote? 	<ul style="list-style-type: none"> Did I take notes in the correct location? Are things in the correct spot of my binder? 	<ul style="list-style-type: none"> Did I maintain on topic comments? Did I stop and think before answering questions? 	<ul style="list-style-type: none"> Did I use my problem solving strategy? (Color Binder) 					
Score	Correct	Self-CORR	Correct	Self-CORR	Correct	Self-CORR	Correct	Self-CORR	Points
	Y ○○○ N	Y N	Y ○○○ N	Y N	Y ○○○ N	Y N	Y ○○○ N	Y N	

Slide
50



Questions???

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