

## TEACHING EXECUTIVE FUNCTION SKILLS TO CHILDREN WITH AUTISM

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### Applied Behavior Analysis Second Edition



John O. Cooper • Timothy E. Heron • William L. Heward

## CHAPTER I - SENTENCE I

“Applied behavior analysis  
is a science devoted to the  
understanding and improvement  
of human behavior.”



## OUR “HUMAN BEHAVIOR” FOCUS

Where would you say we  
spend the majority of our  
time programming?

If we want to make  
sure we’re addressing the  
core diagnostic aspects of  
autism, where else should  
we also focus?

SOCIAL COMMUNICATION

- Back-and-forth Conversation
- Sharing of Interests
- Emotions
- Initiating + Responding
- Nonverbal Communication
- Body Language + Gestures
- Facial Expressions
- Understanding Relationships
- Adjusting Bx to Social Context
- Sharing Pretence
- Interest in Peers

RESTRICTED BEHAVIOR

- Insistence on Sameness
- Inflexible | Routines
- Rigid Thinking
- Fixated Interests
- Perseverative Behavior



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SOCIAL PROGRAMMING

- Play Skills
- Perspective-Taking
- Social Skills Interventions





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RESTRICTED BEHAVIOR

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EXECUTIVE FUNCTIONING



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# WHAT IS EXECUTIVE FUNCTIONING?

Turning Neuroscience into Observable Behaviors



## EXECUTIVE FUNCTIONS

• Definition: Umbrella term used to describe the “chief operating system” localized in the prefrontal regions which includes higher level cognitive processes necessary for future oriented, **goal-directed behavior**.

- Working Memory
- Sustained Attention
- Inhibitory Control
- Cognitive Flexibility
- Planning + Goal Setting
- Organization
- Persistence, Self-Monitoring
- Problem Solving

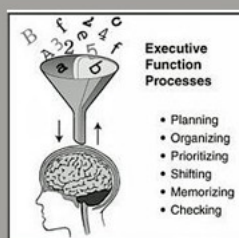


## EXECUTIVE FUNCTIONS



- Prefrontal Cortex
  - With development of different areas associated with EF skills
- Clinical populations with EF Dysfunction
  - TBI results in loss of EF once present
  - ADHD
  - Dyslexia
  - LD
  - **ASD**

## INTERRELATEDNESS OF EF SKILLS



Fantastic point. Let's self-monitor our progress before moving forward.

But wait! I was promised an ABA take on EF. So far we've only talked about the brain.



## BRAIN OR BEHAVIOR?

- Traditionally, EFs are considered brain functions
- But EFs are used *when we interact with our environment*
- That is, all EFs involve behavior
- Behavior is learned and it can be strengthened
- If even a small portion of EF performance is learned behavior, then we should be able to improve it
- We are not denying the participation of the brain, we are making the most of it



## WHO'S THE EXECUTIVE?

- Skinner talked about self-control as two repertoires of behavior
- The "controlled self" refers to your normal, ongoing behavior
- The "controlling self" refers to a repertoire of behaviors you have learned that control your other behavior



- Skinner believed one can control one's own behavior in the same way one control's other behavior: **By changing the environment in ways that affect the behavior**



## SECONDARY REPERTOIRES OF BEHAVIOR

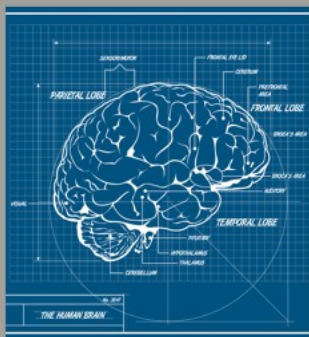


- Neuroscience: EF brain mechanisms / chemistry controls our behavior
- Behavioral approach: WE **learn** to control our own behavior by using other "secondary" behaviors to do it
- Practically speaking, these approaches can be complimentary, not contradictory

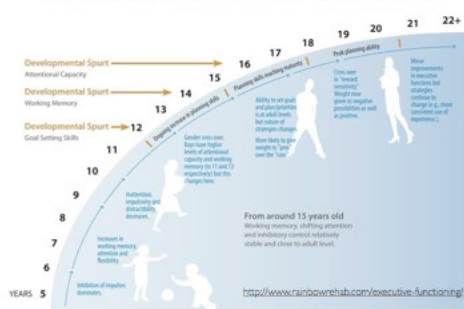


## TYPICAL DEVELOPMENT OF EXECUTIVE FUNCTIONING

Our Guide to Programming

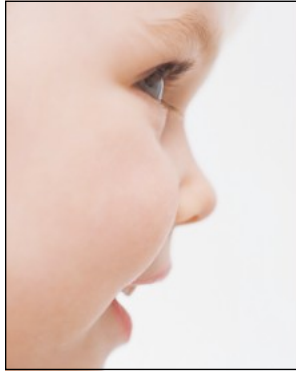


## TYPICAL EF DEVELOPMENT



## EF DEFICITS IN AUTISM

- What do you think - What does your clinical experience tell you?
- Diagnostic criteria certainly speaks to some issues
- Consideration of both behavioral history and brain development could suggest likely impairment (little opportunity to rehearse / learn)
- Research is actually inconsistent
  - Some find no differences
  - Others find some, particularly in the areas such as Flexibility | Shifting (makes sense when looking at the opposite - Perseveration)



## INTERVENTION RESEARCH

Can These Skills Be Taught?

## SHORT ANSWER?



- Think of yourself
  - Are there EF areas you tend to be stronger | weaker in?
  - How do you handle?
- As with much EF research, findings are not consistent
  - Some remediation found to be possible, other times less so
  - While working on remediation then, may also want to look at environmental supports

LET'S SEE!

So we know our children need to learn these skills, they can be taught (sort of), but more needs to be done to generalize and make functional... HOW DO WE DO IT???



## EXECUTIVE FUNCTION INTERVENTION





## EF PROGRAMMING OVERVIEW



- ASSESSMENT
- TEACHING PROCEDURES AND GENERAL RECS
- PROGRAMMING AREAS



### ASSESSMENT

Does My Client Have Deficits in Executive Function Skills?



## INDIRECT ASSESSMENTS

### STANDARDIZED

- Behavior Rating Inventory of Executive Function (BRIEF)
  - Ages 5-18
- Behavior Rating Inventory of Executive Function - Preschool (BRIEF-P)
  - Ages 2-5
- Parent and Teacher Forms
- Assesses across various EF Domains
- Helpful for reports - Informing "higher-level" goals
- Test of Problem Solving (TOPS)



DIRECT - OBSERVATIONS IN NATURAL ENVIRONMENT.



## WORKING MEMORY DEFICITS

### Assessing for EF Dysfunction



- Retrieval task failures
- Trouble remembering quick facts
- Difficulty remembering rules governing specific tasks
- Struggles with mental manipulation tasks
- Frequent off-task behavior | Inattention



# INHIBITORY DEFICITS

## Assessing for EF Dysfunction



- Impulsivity
- Emotional explosiveness | Cries easily
- Laughs hysterically with little provocation
- Lack of personal safety
- General failure to "look before leaping"
- High level of physical activity and motion
- Inappropriate physical response to others
- Tendency to interrupt
- Tendency to disrupt group activities



# COGNITIVE FLEXIBILITY DEFICITS

## Assessing for EF Dysfunction



- Perseverative behavior | Unable to drop topics of interest
- Difficulty with transitions
- Rigid and inflexible
- Demand | Require consistent routines
- Frequent off-task behavior | Inattention
- Unable to move beyond a disappointment
- Lack of creativity | flexibility in problem solving
- Tendency to apply same incorrect response even with negative feedback



# SELF-REGULATION | MONITORING DEFICITS

## Assessing for EF Dysfunction



- Rushes through tasks
- Makes careless errors
- Often skips steps of task
- Doesn't check work or final result
- Fails to monitor progress towards goal
- Fails to demonstrate pride in goal attainment
- Does not track effect of behavior on others
- Does not adjust or alter behavior if ineffective or offensive



# PLANNING & PROBLEM SOLVING DEFICITS

## Assessing for EF Dysfunction



- Fails to initiate tasks without direction
- Approaches tasks in a haphazardly fashion
- Gets caught up in the details and misses the main idea
- Becomes overwhelmed by large amounts of information
- Fails to obtain correct tools | materials in advance
- Fails to break down tasks or use strategies to problem solve
- Difficulty maintaining order in environment



# EXECUTIVE FUNCTIONING INTERVENTION

## 1. EF Skill Building

- Exercises to try to improve deficient EF Skills
- Ex: Practicing Multiple-Steps for Working Memory

## 2. Teaching Compensatory Strategies

- Strategies that may learn to implement him/herself to reduce the impact of EF deficits
- Ex: Child learns to make a "To Do" list

## 3. Environmental Supports

- Accommodations + Modifications to reduce the impact of EF deficits
- Ex: Visual Schedules in Classroom for Routines

## 4. Real-Life Application

- Rehearsing combination of all the above
- Fading to natural contingencies

"Lending them Our Frontal Lobes"



## EXECUTIVE FUNCTIONING SKILL BUILDING

Analogue Practice	Real-Life Practice
Contrived, more-controlled setting	Natural, less-controlled setting
Many practice opportunities	Fewer opportunities (either surreptitiously planned or naturally occurring)
Easy to control difficulty	Difficult to control difficulty level
Easy to control anxiety level	Difficult to control anxiety level
Generalization is a major concern	Generalization is more likely (but not guaranteed!)

## ANALOGUE VERSUS NATURAL SETTINGS

- Analogue practice is like a musician practicing scales
- Naturalistic training is like a musician rehearsing whole songs
- Both are necessary to get you ready for the big concert
- Musicians in training spend LOTS OF TIME doing both
- If we want our clients to develop EF skills, we need to allow lots of time for both



## BRING THE FUN

- Like all other learning, kids are going to learn EF skills more effectively if learning is FUN
- Two general approaches to bringing the fun:
  1. Big positive reinforcement
  2. Change the antecedents:
    - Make the task fun (e.g., games)
    - Intersperse with other fun tasks
    - Incorporate child choice
    - Make sure instruction is upbeat and fun



## FOCUS ON GENERALIZATION

- We are interested in established flexible, generalized operant skills
- Multiple exemplar training and other generalization procedures should be used throughout
- These skills are meaningless if they can only be used in the presence of the stimuli and settings that were included in training



## PROGRAMMING AREAS

- Let's have a look at turning some of these brain functions into skills we can teach!
- Working Memory
- Sustained Attention
- Inhibitory Control
- Cognitive Flexibility
- Planning + Goal Setting
- Organization
- Problem Solving
- Self-Monitoring





## SAMPLE PROGRAMMING: INHIBITORY CONTROL

1. EF Skill Building

2. Compensatory Strategies

3. Environmental Supports

4. Real Life Application



## INHIBITION



- Inhibitory Control includes inhibiting, resisting, or not acting on impulses
- And the ability to stop one's own behavior at the appropriate time

## INHIBITION

- Inhibition, as a skill, is not merely the absence of a behavior
- It is *doing something* that then prevents one from doing something else or stopping current behavior
- When we use extinction or punishment to decrease a behavior, we are not directly teaching inhibition skills
- When we use a DRO, we are not directly teaching inhibition skills



## INHIBITION

- **"Cognitive" inhibition**
  - The ability to stop thinking a particular way, when appropriate
- **Inhibition of overt behavior**
  - Stopping oneself from engaging in an overt behavior that would otherwise be highly likely



## INHIBITION

- Related to flexibility
  - Being flexible about how you do something, almost by definition, entails the ability to inhibit the way you normally do it
- Related to stereotypy
  - A lack of inhibition can also look like an excess of stereotypy, particularly if you like to do things the same way repeatedly



## INHIBITION

### 1. EF Skill Building

- Draw a tree but don't use green
- Sing Old MacDonald without saying "farm"
- Sing ABCs without saying the letter "m"
- Simon Says
- Bop-It
- Reading underlined word silently
- Jenga

### •Brainstorm!



## INHIBITION

### 2. Compensatory Strategies

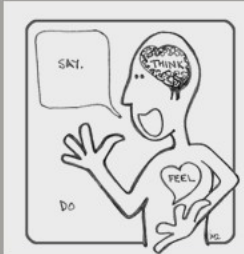
- Self-talk, reflection
- Plan an alternative behavior
- Priming
- Stop-Think-Do

### 3. Environmental Supports

- Avoid situations with conflict
- Avoid situations that are loud or over-stimulating
- Avoid junk food
- Avoid stimuli that will evoke inflexible stereotypy



## INHIBITION: STOP-THINK-DO



### Inhibitory Strategy: Stop-Think-Do

- Train in analogue setting at first
- Use visual support
- Fade prompts
- Fade visual support
- Fade to natural setting



## INHIBITION

### 4. Real Life Application

- Not raising hand for X minutes while teacher talks
- Not finishing sentence when someone says "I get it"
- Not engaging in stereotypy when you hear a particular song or see a particular picture

### •Program that Skill!



## SAMPLE PROGRAMMING: WORKING MEMORY

### 1. EF Skill Building

### 2. Compensatory Strategies

### 3. Environmental Supports

### 4. Real Life Application

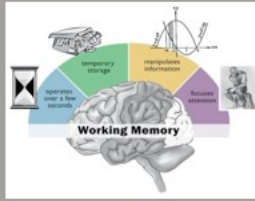


## WORKING MEMORY

• **"Working Memory"** is the term used to refer to the ability to

- Hold +
- Manipulate

• Information in the "mind" for short periods of time



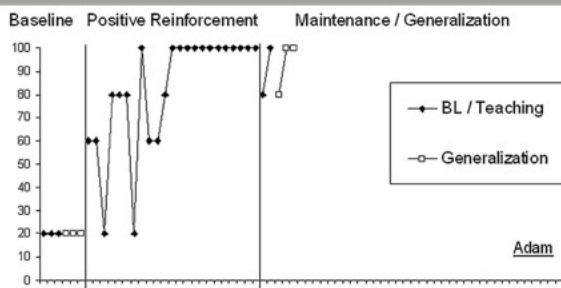
## WORKING MEMORY

### I. EF Skill Building

- Digit | Letter | Word Recall
- + Reversals
- Following Multi-Step Instructions
- Delivering a Message
- Running Errands
- Memory Tray
- Pig Latin
- Spelling Bee
- I Packed My Suitcase
- Card Games
- Online Memory Games
- Board Games
- Memory
- Simon
- Pictureka
- Hulabaloo
- Battleship



## WORKING MEMORY: SAMPLE SKILL BUILDING DATA



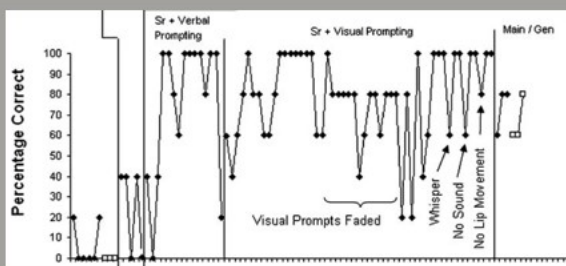
## WORKING MEMORY

### 2. Compensatory Strategies

- List Writing
- textual or Iconic
- Repetition | Rehearsal
- whisper under breath
- Visual + Physical Cues
- string on a finger | Post-Its
- Finger Cues | Counting
- Mnemonic Devices
- Kings Play Cards on Fat Green Stools
- Use Humor | Funny Visuals
- make silly mental picture
- Use of Agenda to plan and remember upcoming events



## WORKING MEMORY: SAMPLE COMPENSATORY STRATEGY DATA



## WORKING MEMORY

### 3. Environmental Supports

- Remove | Reduce Distractions
    - Proximity
      - have needed items nearby
  - To Do Lists
  - Visual + Physical Cues
    - visual schedules hanging in room
    - model strategy for child
- FLUENCY FIRST

## WORKING MEMORY

### 4. Real-Life Application

- Memorizes phone number and dials number
  - Spelling tests / Listen and write tasks
  - Mental arithmetic
  - Reading and understanding content (reading comprehension tasks)
  - Following multi-step directives (e.g. go find your shoes and put them by the door)
- **Program that Skill!**
- FLUENCY FIRST

## SAMPLE PROGRAMMING: ATTENTION

### 1. EF Skill Building

### 2. Compensatory Strategies

### 3. Environmental Supports

### 4. Real Life Application



## SUSTAINED ATTENTION + PERSISTENCE



- Continuing to pay attention to task despite distractibility
- Persisting in the face of adversity

## SUSTAINED ATTENTION

### Sustained attention

- Paying attention to a particular stimulus for a prolonged period of time
- Almost by definition, **longer than you want to**
- If you wanted to pay attention that long, you wouldn't need training in it

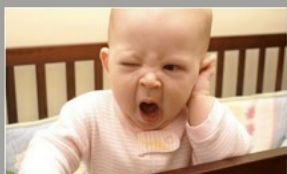
### Competing reinforcement contingencies:

1. Continue to pay attention to the same stimulus and get no reinforcement (maybe even get punishment)
  2. Pay attention to something else and get reinforcement (or at least escape from boring stimulus)
- FLUENCY FIRST

## SUSTAINED ATTENTION

**Sustained attention is BORING!**

**We need to make practicing it FUN!**



## SUSTAINED ATTENTION

### 1. EF Skill Building

#### Sustained attention tasks

- Reading a book
- Quiet time
- Repetitive tasks
  - Rainbow loom
  - Lanyards Beading
  - Cats Cradle
  - Origami



## SUSTAINED ATTENTION

### 2. Compensatory Strategies

- Visual + Physical Cues
  - string on a finger | Post-Its
- Priming | Prior review of task analysis
  - i.e., eyes/ears on teacher, write 3 sentences, beat the timer, check off when done

### 3. Environmental Supports

- Use timers
- Preferential seating in classrooms and/or 1:1 aide
- Provide frequent breaks
- Reduce all distraction
- Select stimuli of interest
- Avoid stimuli that will evoke inflexible stereotypy



## SUSTAINED ATTENTION

### 4. Real-Life Application

- Sits nicely and enjoys circle time activities
- Engages in on-topic reciprocal conversation with others
- Finishes meals in one sitting and on schedule
- Cuddles with Dad as he reads story book before bed
- Able to participate in group games and activities = FUN!

**• Program that Skill!**



## SAMPLE PROGRAMMING: FLEXIBILITY

### 1. EF Skill Building

### 2. Compensatory Strategies

### 3. Environmental Supports

### 4. Real Life Application





## COGNITIVE FLEXIBILITY

- Ability to switch between thinking about two different concepts
- and to think about multiple concepts simultaneously
- Also referred to as “**Set Shifting**”

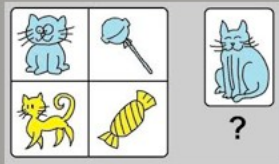
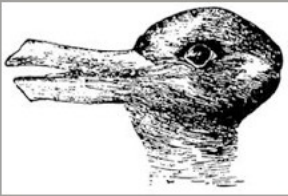


## COGNITIVE FLEXIBILITY

- Potential behavioral definition:
  - Variability in behavior, while behavior remains task-relevant
  - Sensitivity to ongoing environmental changes
  - Not just random variability
  - Necessary for creativity
  - Necessary for problem solving



## COGNITIVE FLEXIBILITY



## COGNITIVE FLEXIBILITY

### A-Not-B Task



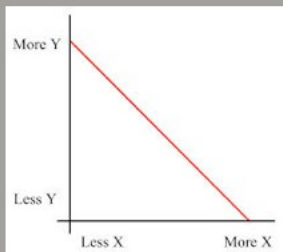
Sequence of events involved in the “A-not-B error.” This is a standard two-location search task, in which an object is hidden first at one location (A) and then at another (B). A baby watches an object being hidden at Location A; the baby searches at A and finds the object; the object is then hidden at Location B while the baby watches; the baby searches at A. “Where’s the car?”

Play

EF Series - AboutKidsHealth.ca (Zelazo, 2010)

## COGNITIVE FLEXIBILITY

Perseverative  
Responding



Flexibility

## COGNITIVE FLEXIBILITY

**MISSION CRITICAL**

- **Importance**
  - Directly related to diagnostic features of ASD
  - Necessary for creativity
  - Necessary for problem solving



## COGNITIVE FLEXIBILITY



- For some children with ASD, variability, per se, seems to be aversive and anxiety-provoking
- How do we make something less aversive???



## COGNITIVE FLEXIBILITY

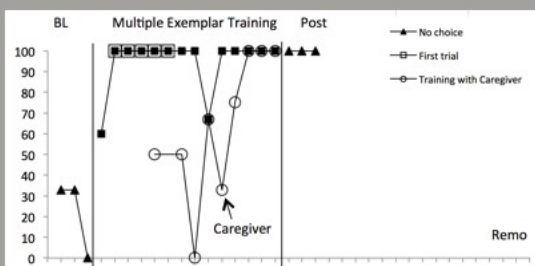
### I. EF Skill Building

#### • *Exposure and response prevention*

- Helps decrease aversive functions for "inflexibility stimuli"
- Expose child to many exemplars of inflexibility stimuli
- Prevent "fixing" or escaping from it
- Reinforce calmly tolerating
- Keep training with new examples of inflexibility stimuli until the child is success with examples that had not been addressed before (i.e., generalization)



## SAMPLE CLINICAL DATA



## COGNITIVE FLEXIBILITY

#### • **Skill training: Analogue**

- Making up nonsense words
- Making up many different meanings for nonsense words
- Changing rules for known games
- Making up new games
- "Backwards day"
- Optical illusions
- Changing the words to songs
- Changing schedule
- Having breakfast for dinner and vice versa
- Going by a "silly name" for the day
- Mad libs
- Say word over and over till it loses its meaning



## COGNITIVE FLEXIBILITY

### 2. Compensatory Strategies

- Positive self-talk
- Guided breathing
- Count to ten
- Imagery

### 3. Environmental Supports

- Start with tasks the learner is likely to be successful with
- Gradually increase the frustration level, only as he/she is success at the previous level
- Continue training more examples until learner generalizes to untrained tasks



## COGNITIVE FLEXIBILITY

### 4. Real Life Application

- Tolerates change of plans
- Tries new food, new toy, new situations
- Able to learn from mistakes
- Can suggest alternative endings to stories, alternative rules for games
- Imaginary play
- Artistic expression
- Perspective taking

### • Program that Skill!



## SAMPLE PROGRAMMING: MONITORING

### 1. EF Skill Building

### 2. Compensatory Strategies

### 3. Environmental Supports

### 4. Real Life Application



## SELF-MONITORING | REGULATION



- Work-checking behaviors to assess one's own performance
- Monitoring the effect one's behavior has on others

## SELF-MONITORING

- Skinner: We become conscious of our own behavior when our verbal community teaches us to notice what we are doing

- "What did you do?"
- "What are you doing?"
- "Why are you doing it?"

It seems like a simple question.



## SELF-MONITORING



- Self-observation is another example of a **secondary repertoire** of behavior
- Behavior that is overarching and responds to and supports other behavior



## SELF-MONITORING

### 1. EF Skill Building

- Many empirically validated behavior change procedures involve self-monitoring and self-evaluation
- Habit reversal
- Goal setting and feedback
- Self-evaluation in training
- Occasionally, self-monitoring training, alone, changes behavior sufficiently



## SELF-MONITORING | REGULATION

### 2. Compensatory Strategies

- visual | auditory | tactile monitoring cues
- self-monitoring | evaluation checklists

### 3. Environmental Supports

- use of video for guided training
- Provide lists | definitions of target behavior
- teach use of monitoring devices
- access to reinforcement for use of self-monitoring procedures



## SELF-MONITORING | REGULATION

### 4. Real Life Application

- Multiple step tasks | activities completed on time with targeted accuracy
- Error correction via increased self-monitoring | awareness
- Improved understanding of what behavior is required to achieve goal
- Attention to process as well as product

• **Program that Skill!**



## SAMPLE PROGRAMMING: PLANNING

### 1. EF Skill Building

### 2. Compensatory Strategies

### 3. Environmental Supports

### 4. Real Life Application



## PLANNING + GOAL SETTING

- Anticipating future events, setting goals, and developing appropriate steps, organizing ahead of time to carry out a task or activity
- May involve imagining or developing a goal and then strategically determining the most effective method or steps to attain the goal
- Helps manage current and future-oriented tasks



## PLANNING

### Steps

1. Identify goal
2. Organize and create steps needed to reach goal
3. Identify potential problems
4. Begin planned sequence of steps
5. Monitor progress
6. When problems come up, generate potential solutions
7. If successful, recruit reinforcement (if appropriate)



## PLANNING STEPS

### 1. EF Skill Building

- Create steps needed to reach goal
- Involves identifying likely future consequences of various future behaviors
- Rule-deriving
- Start small to teach the necessary verbal behavior
- Any board game: Before each turn, have learner say out loud what he is trying to achieve and what will happen if he makes various moves
- This is essentially creating and executing a plan with a single step



## PLANNING | ORGANIZATION

### 1. EF Skill Building

- Packing a Suitcase
- Shopping
- Packing for a picnic
- Legos
- Putting a game back into a box
- Organize materials needed for project
- Narrow down concept to main ideas
- Story Mapping
- Minecraft
- Math word problems
- Categories
- Passing things out to group of people in an organized manner
- Setting the table
- Dealing Cards



## PLANNING

### 2. Compensatory Strategies

- To do list
- Decision trees
- Self-talk
- Looking things up on google
- Most of these strategies can be useful across most planning activities

### 3. Environmental Supports

- Either make or assist client in writing steps of plan to refer to during project





## PLANNING ACTIVITIES

### 4. Real-Life Application

#### Tasks

- Plan a playdate
- Make a gift for mom
- Cook a meal or snack
- Pack for an outing
- Plan steps needed to complete a school project
- Chess
- Checkers
- Card games
- Mazes
- Obstacle courses
- Scavenger hunts



## PUTTING IT ALL TOGETHER *The Art of Problem Solving*



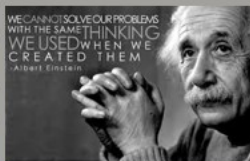
## SAMPLE PROGRAMMING: PROBLEM SOLVING

### 1. EF Skill Building

### 2. Compensatory Strategies

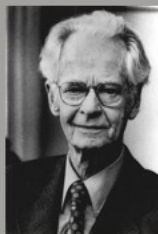
### 3. Environmental Supports

### 4. Real Life Application



## PROBLEM-SOLVING

- B. F. Skinner: A problem is a situation where an outcome would be reinforcing, if only you had a behavior needed to produce it
- In other words, you know what you want but you don't know what to do to get it



## PROBLEM-SOLVING

### Problem-solving as a Class of Behavior:



- Behaviors you engage in that result in identifying the behavior needed to bring about the desired outcome
- In other words, it's the skill of figuring out what you need to do to get what you want



## PROBLEM-SOLVING VS PLANNING

- Problem-solving is similar to planning
- Both involve deciding what you need to do in the future, in order to produce a particular outcome
- Planning is what you do before there is a problem (and may prevent problems)
- Problem solving is what you do when a problem comes up



## PROBLEM-SOLVING VS PLANNING

### Planning

Prepare for a play date

Planning how to complete a school project

You buy a new skateboard and plan how to assemble the parts

### Problem-Solving

Make your friend feel better after you accidentally hurt his feelings

The tool you need for a project breaks while you are working on the project

A bolt on your skateboard breaks and you need to fix it



## PROBLEM-SOLVING

- Not much published research on teaching problem-solving skills to children with ASD
- Current ongoing research:
  - Lechago, Univ of Houston
  - Tullis, Georgia State Univ
  - Szabo, Florida Insit of Tech



## PROBLEM-SOLVING

### Steps

1. Identify problem
2. Explain why it's a problem
3. Generate potential solutions
4. Choose a solution and implement it
5. Monitor progress
6. If unsuccessful, choose a new solution
7. If successful, recruit reinforcement (if appropriate)



## PROBLEM-SOLVING: SKILL BUILDING

### 1. EF Skill Building

- Depending on functioning level of learner, either:
  - Use forward chaining start teaching first step (easier)
  - Or use total task chaining to teach all steps at once (harder)



## PROBLEM-SOLVING: SKILL BUILDING

- Prompting and fading
  - Use ample prompts at first, so learner is successful
  - Fade out prompts to encourage independence
  - Use “leading question” prompts rather than directive and echoic prompts
  - Guide the learner to “figure it out” rather than telling her what to do
- Leading question prompts
  - “What do you think might work?”
  - “Is that going to fix it or make it worse?”
  - “I wonder what would happen if you did X....”



## PROBLEM-SOLVING EXAMPLES

Problems	Solutions
Crayon breaks	Tape it back together Pick a different color Use it anyway
Bottle of glue is jammed	Squeeze harder Poke it with a paper clip Use tape or staples instead
Can't open a box that is taped shut	Get scissors to cut tape Peel tape off Tear box
Not enough chairs for everyone to sit on	Use something else as a chair Sit two people on one chair Find another chair



## PROBLEM-SOLVING

### 2. Compensatory Strategies

- Stay Calm - slow breathing, positive self-talk, count to calm
- Get out Problem Solving handouts to guide process of finding solution(s)
- Use class resources- computer, books, handouts
- Calmly ask for help if needed

### 3. Environmental Supports

- Visual prompts and guides
  - Steps to problem solving
- Peers may be recruited for help
- Class resources - books, computer, etc.



## PROBLEM-SOLVING

### 4. Real Life Application

- Computer stops working
  - stays calm, immediately engages problem solving steps:
    - ✓ assesses possible reasons,
    - ✓ based upon assessment, devises potential solutions,
    - ✓ implements best solution,
    - ✓ evaluates effectiveness,
    - ✓ selects another possible solution if needed,
    - ✓ fixes computer and **gets back to work!**

### • Program that Skill!



## WRAPPING IT ALL UP

### Our ASD clients appear to have significant EF deficits

- Behavior often rigid and inflexible; an “insistence on sameness,” difficulty with creativity / imaginative thinking
- Often demonstrate perseverative interests
- Tend to fail to be “future oriented”
- often unable to identify goal or purpose,
- need assistance to “stop”, “think” of **potential immediate and long term consequences**, then “do”
- have extreme difficulty self-monitoring
- Impulsive behavior evident in many clients



## BRAIN-BEHAVIOR CONNECTION

- Executive Functions necessary for everything we, as human beings, DO....
- Given we are not born with fully developed EF skills, safe to assume a biology + learning effect
- Our kids have not acquired many EF skills, likely due to biological factors
- As behavior analysts, it is time to use our skills and get our kids learning and developing EF skills
- By programming for EF skills, we reduce core diagnostic symptoms and enable new and adaptive and socially meaningful behavior to be learned!



## BRAIN-BEHAVIOR CONNECTION

### Targeting EF Skills for our Clients

- Use skill building techniques, provide strategies and supports while learning,
- and ensure generalization through real life application



## ABA AND EF

- We, AS BEHAVIOR ANALYSTS, are able to use our own EF skills and.....
- Identify our clients' specific deficits
  - ✓ Engaging our EF = **Attention**,
- Organize intervention strategies and treatment plans to address those issues
  - ✓ Engaging our EF = **Planning|Organization and Problem Solving**,



## ABA AND EF

- Devise multiple strategies of targeting and training
  - ✓ Demonstrating EF = **Cognitively Flexibility**,
- Inhibit our attention to the nay-sayers,
  - ✓ EF = **Inhibition** of annoyance
- Recall our plan, stay on task, and execute it
  - ✓ Using EF = **Working Memory**
- Monitor our client's response and progress,



## ABA AND EF

### Targeting EF Skills:

- To ultimately remediate executive dysfunction in our clients diagnosed with ASD!

