THE ART and Science of Educating Students with Autism Spectrum Disorder

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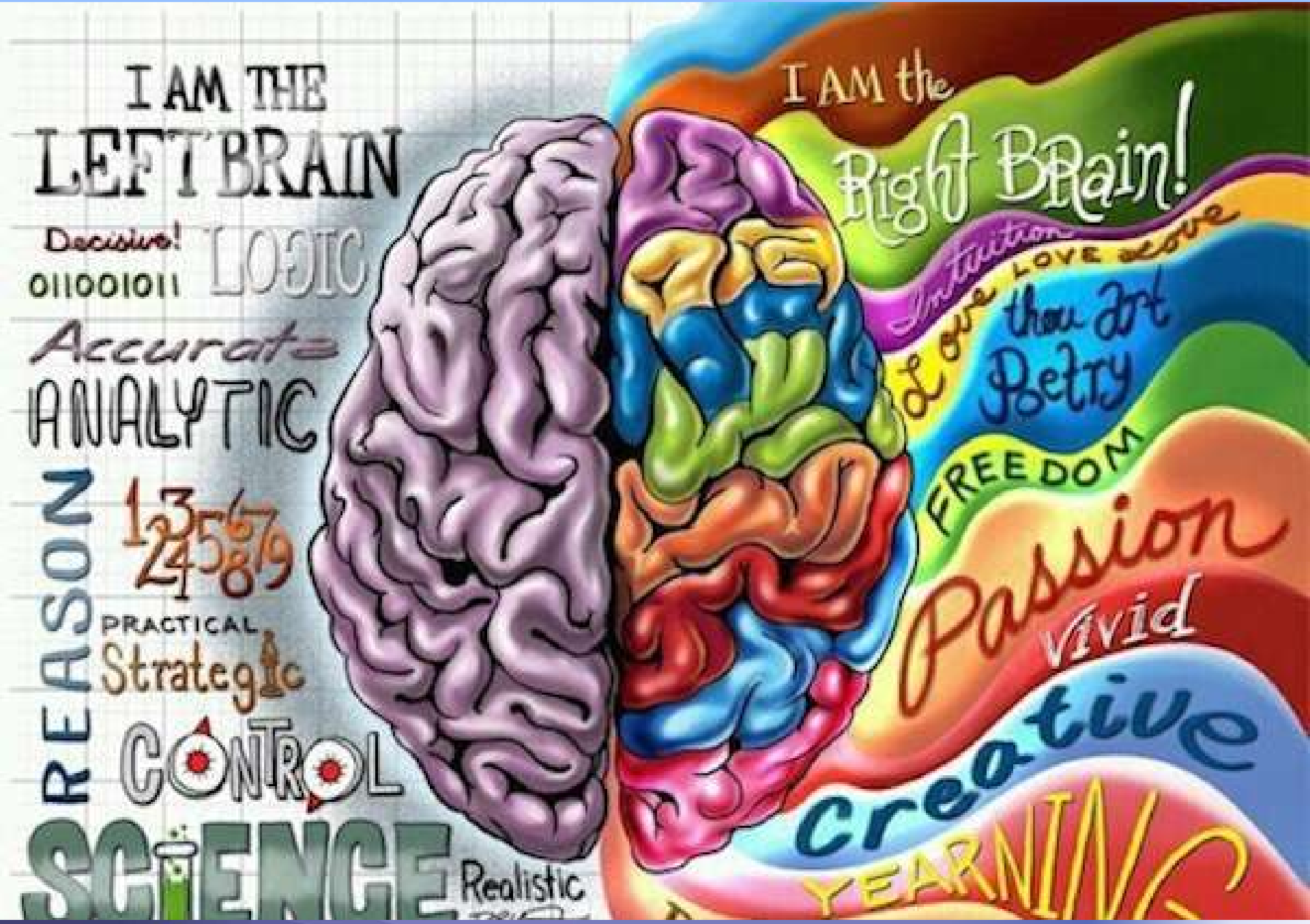
The Art:

Philosophic, attitudinal, and relational – the seemingly intangible aspects of effective instruction. Our temperament and personality as educators is part of this.

The Science:

Technical, analytical, empirical – relies upon the best available evidence to determine what curricula and procedures to use.


I AM THE
LEFT BRAIN
Decisive!
01100101
LOGIC
Accurate
ANALYTIC
REASON
1 3 5 6 7
2 4 5 8 9
PRACTICAL
Strategic
CONTROL
SCIENCE
Realistic
I AM the
Right BRain!
Intuition
& our LOVE is love
thou art
Poetry
FREEDOM
Passion
vivid
creative
YEARNING

- Carol Gray asked about year-to-year variability; student or teacher variables
- For educators who experience more success*, are there some shared characteristics?

1. Truly “see” the autism
2. View problems as a result of skill deficits
3. Respond to social and other errors the way we do academic mistakes
4. Choose a therapeutic rather than disciplinary response

The View Through a Behaviorist Lens

- The “dispassionate detective”
- Pragmatic; discards value-laden, emotional responses to difficult behaviors
  - “He needs to learn…”
  - “Eventually he’ll figure out who’s boss”
  - “With my children…”, “When I was…”
  - “He’s being manipulative”, ascribing motives
- Thorough understanding of ASD
  - “Behavior is Communication”

5. Understand the disconnect between chronological age and developmental level
6. Meets students “where they are” today
7. Behavior is communication

8. Don’t take things personally
9. Check emotional responses
10. Know how to have fun, connect through humor and play
11. Enjoy and like their students

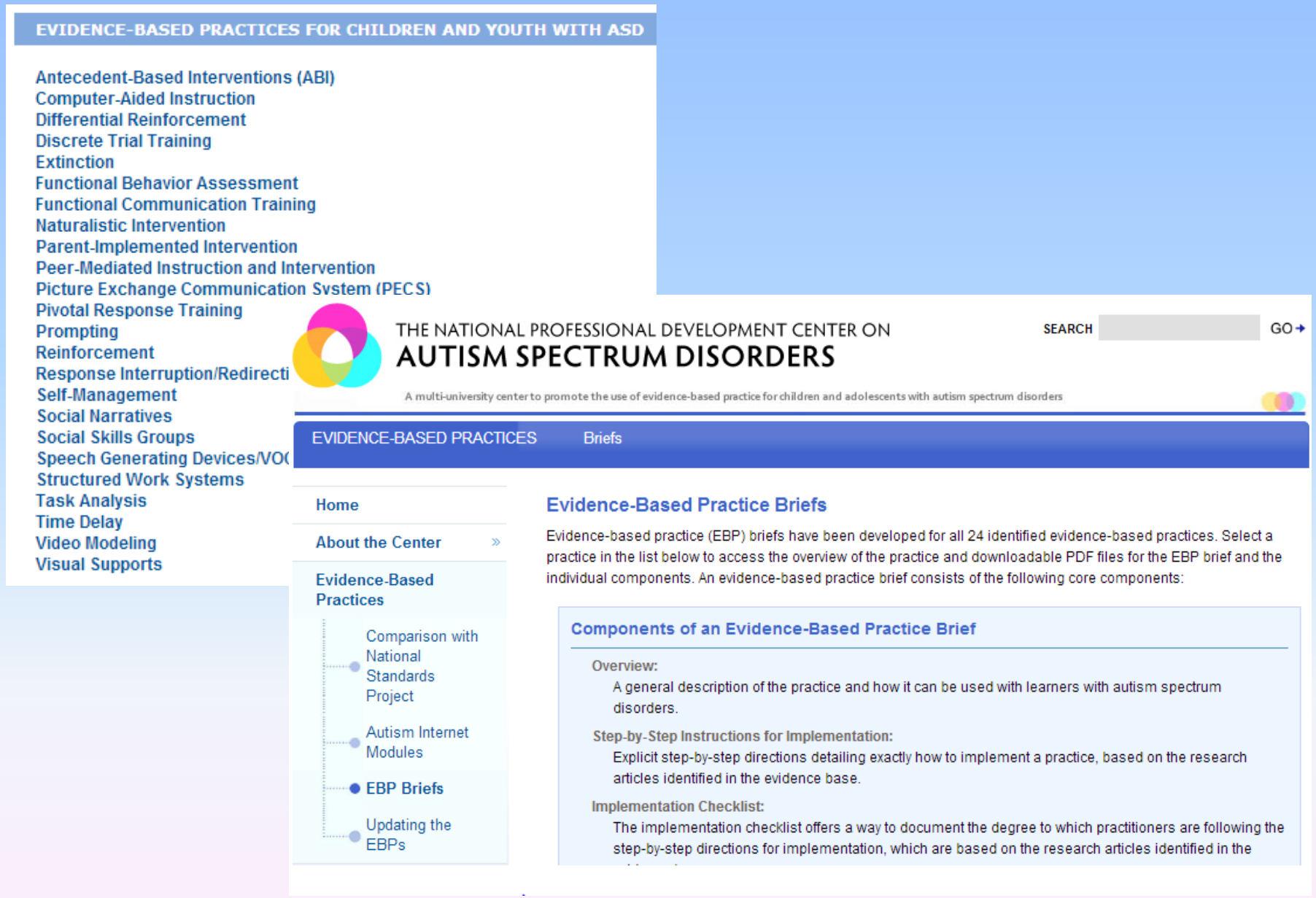
12. Develops warm, supportive rapport
13. Provides explicit, concrete feedback in a patient, matter-of-fact manner
14. Know when to time instruction
15. Avoid power-struggles, and are willing to negotiate

16. Think analytically about how to defuse and de-escalate situations
17. Adjusts communication; concise & concrete, back off when triggered
18. Teach the “seemingly obvious”; unwritten social rules, emotional regulation, organization

19. Use visual and written supports to adjust for transience of speech and build independence
20. Facilitates rather than controls via task analysis, prompting, and reinforcement

21. Relentless focus on fading support and developing independence
22. Provides choices and options whenever possible
23. Views the student with ASD as a puzzle, not a thorn

- Much of our instruction: establishing or increasing target behaviors, while eliminating or decreasing undesired behaviors
- Examples?
- A foundation in evidence-based practices


EVIDENCE-BASED PRACTICES FOR CHILDREN AND YOUTH WITH ASD
Antecedent-Based Interventions (ABI)
Computer-Aided Instruction
Differential Reinforcement
Discrete Trial Training
Extinction
Functional Behavior Assessment
Functional Communication Training
Naturalistic Intervention
Parent-Implemented Intervention
Peer-Mediated Instruction and Intervention
Picture Exchange Communication System (PECS)
Pivotal Response Training
Prompting
Reinforcement
Response Interruption/Redirecti
Self-Management
Social Narratives
Social Skills Groups
Speech Generating Devices/VO(
Structured Work Systems
Task Analysis
Time Delay
Video Modeling
Visual Supports
THE NATIONAL PROFESSIONAL DEVELOPMENT CENTER ON
AUTISM SPECTRUM DISORDERS
SEARCH
GO
A multi-university center to promote the use of evidence-based practice for children and adolescents with autism spectrum disorders
EVIDENCE-BASED PRACTICES
Briefs
Home
About the Center
Evidence-Based Practices
Comparison with National Standards Project
Autism Internet Modules
EBP Briefs
Updating the EBPs
Evidence-Based Practice Briefs
Evidence-based practice (EBP) briefs have been developed for all 24 identified evidence-based practices. Select a practice in the list below to access the overview of the practice and downloadable PDF files for the EBP brief and the individual components. An evidence-based practice brief consists of the following core components:
Components of an Evidence-Based Practice Brief
Overview:
A general description of the practice and how it can be used with learners with autism spectrum disorders.
Step-by-Step Instructions for Implementation:
Explicit step-by-step directions detailing exactly how to implement a practice, based on the research articles identified in the evidence base.
Implementation Checklist:
The implementation checklist offers a way to document the degree to which practitioners are following the step-by-step directions for implementation, which are based on the research articles identified in the

Much of what the research has identified as effective instruction can be boiled down to manipulation of A, B, and C.

Science

Select Evidence-Based Practices (EBPs)

- Antecedent-Based Interventions
- Prompting
- Task-Analysis
- Reinforcement

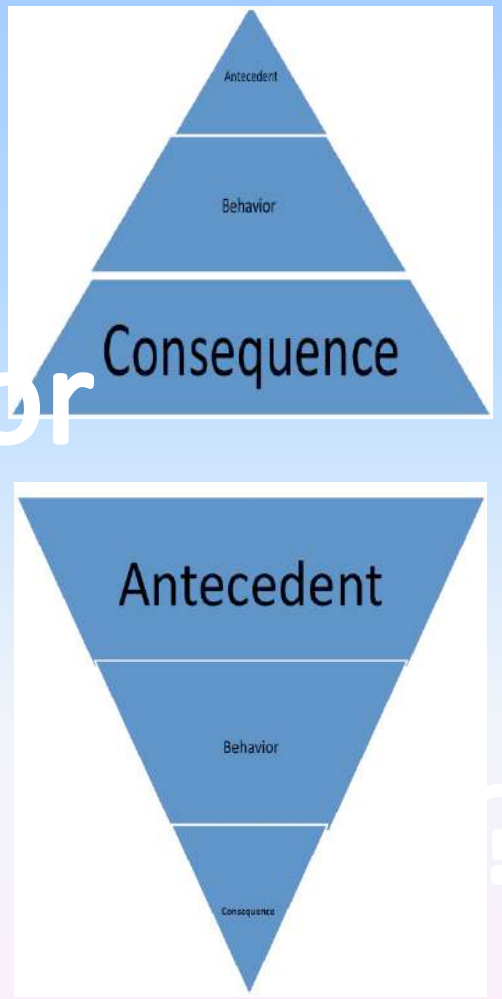
EBP: Antecedent Based Interventions

ABIs are used both to reduce the frequency and intensity of difficult behaviors and to increase targeted appropriate behaviors.

If you are asking, “What do we do when the behavior occurs?” you should also be asking, “How do I prevent the behavior from occurring in the first place”

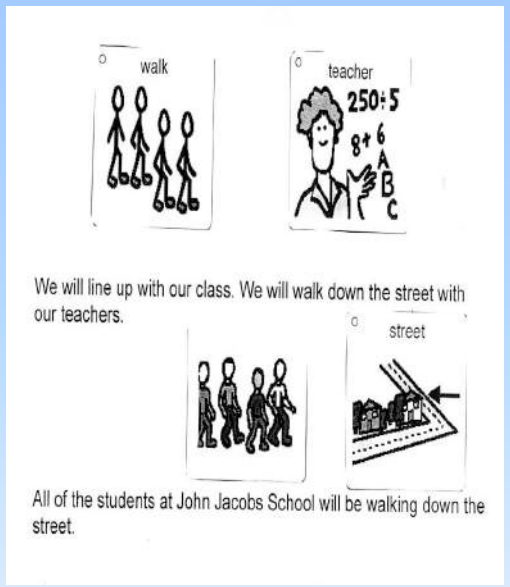
If you are asking, “How can I get him to do the behavior” you should ask be asking “How can I stage things in advance to maximize his success?”

Study and analyze events and situations before behaviors occur – this is very revealing and an key step in functional behavior analysis (FBA). **But where do we spend our time?**



EBP: Antecedent Based Interventions

Common types of ABIs



- Arranging the environment
- Changing the schedule/routine
- Structuring time
- Using highly preferred activities/items to increase interest level
- Offering choices
- Altering the manner in which instruction is provided
- Enriching the environment so that learners with ASD have access to sensory stimuli that serve the same function as the interfering behavior (e.g., clay to play with during class, toys/objects that require motor manipulation)
- Implementing pre-activity interventions (e.g., issuing a cue about the next activity, providing information about schedule changes) - Priming is an excellent ABI

EBP: Antecedent Based Interventions

Environmental Arrangement

- Clean, clearly organized, visually clear areas for specific activities
- Picture jigs and labels to show where things go
- Foot templates on floor to show lining up
- Study carrels for easily distracted
- Giving more space between desks

No "one size fits all" – each child will tend to need some specific ABI, while others are just good practice.

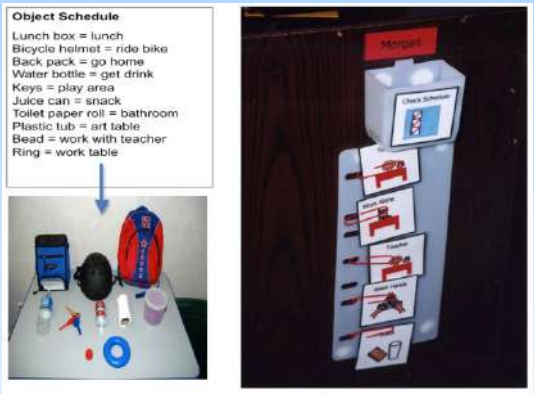
Clearly demarcated areas; colored chairs

Pre-structured activities; using color

EBP: Antecedent Based Interventions

Scheduling and Structuring Time

- Balancing activities; preferred and non-preferred. Be strategic!
- Minimize transitions
- Adhere to consistent schedule
- Alert students to unexpected events and changes (fire alarms)
- Structure time to minimize waiting and idling
- Create predictability and routine
- Visually communicate time, and warn (5 minutes, 2 minutes…)



Object and visual schedules

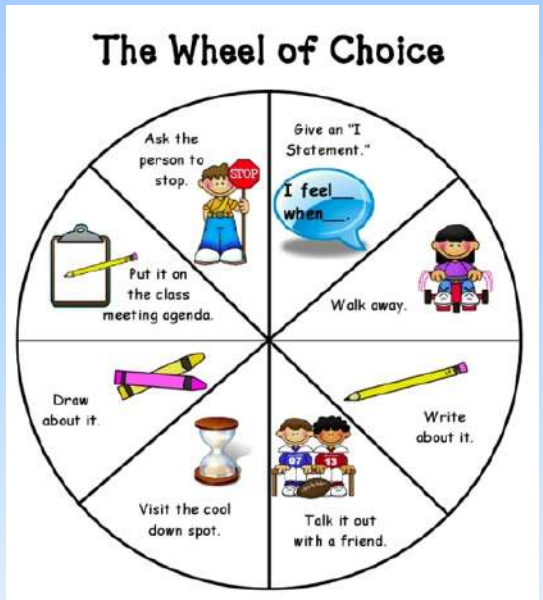
Highly structured time

For each student

EBP: Antecedent Based Interventions

Building in Reinforcers and Offer Choices

- Planning an activity, integrate a high interest topic
- Change conditions of the activity to include snacks or music
- Tell a student he can write a persuasive paper on an area of interest
- Choice-making is very powerful; provide students with options within the scope of your expectations. Red or blue pen? (either way you're writing), read with group or alone? (either way you are reading) 2 or 5 minute break? (either way you're coming back to finish)
- It's ok to negotiate! This is counter to some traditional notions regarding the power relationship between student and teacher
- Provide choice regarding order of task completion



EBP: Antecedent Based Interventions

Change the presentation of instruction

Be prepared to adjust from day to day, as students with ASD are highly variable – all twenty math problems today, perhaps only five tomorrow (bad day!)

Types of Curriculum Modifications Used to Alter Instruction

Curriculum Modification	Definition	Example(s)
Environmental support	The physical, social, and **temporal environment** is altered to promote participation, engagement, and learning	• Rearrange the physical environment by creating a quiet space where the learner with ASD can go when he gets overstimulated • Provide learner with more independent work time if small-group activities become overstimulating • Rearrange the schedule so that the learner with ASD gets free time after each work activity
Materials adaptation	Materials are modified so that learners can participate as independently as possible	• Secure worksheet to a clipboard if the learner has difficulty stabilizing the paper and writing on it at the same time • Modify the response required from the learner (e.g., one word rather than a phrase/sentence) • Make the materials larger or brighter (e.g., highlighting where to write the answer, making the words larger on a worksheet)
Simplification of the activity	A complicated task is simplified by breaking it down into smaller parts or by reducing the number of steps.	• Allow the learner to complete the first two steps of a new task rather than the whole thing • Ensure that the learner finishes a more difficult task successfully
Adult support	Adult intervenes to support the learner's participation in an activity	• Model the correct response • Imitate the learner's play • Use praise and encouragement • Sit behind the learner during circle time to teach motions to a song
Peer support	Peers help teach learners with ASD important skills	• Model the correct response • Pair learner with peer during lunch time to teach social skills
Visual support	Events or materials are purposefully arranged within an activity to provide learners with additional support to complete the activity	• Provide the steps needed to complete an activity • Sequence the tasks within a curriculum activity or area so that learners with ASD know what is expected of them

EBP: Antecedent Based Interventions

Provide ways to meet sensory needs, and adjust to sensitivities

- Lower or change lighting
- Lower noise levels
- Provide alternate seating; ball chairs
- Provide fidgets and sensory materials; foam balls
- Ask staff to avoid cologne and perfume
- Build in relaxation and movement activities (before students get so “fidgety” it becomes interfering)

EBP: Antecedent Based Interventions

Pre-activity Interventions

- Expose to materials and tasks before hand
- Send vocabulary home
- Review steps of an assignment in advance
- Preview the physical environment
- Allow observation prior to participation
- Video modeling (it's own EBP)
- Practice an activity, game, or routine before it's needed in a different, less supportive setting (teaching and practice basketball before they start playing in P.E.

EBP: Prompting

Providing assistance to a learner that increases the likelihood that a desired behavior will occur. Prompts vary by type, degree of intrusiveness, and extent (full to partial)

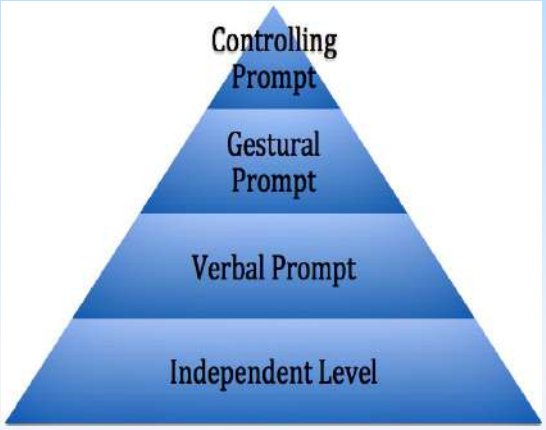
1. ***Verbal prompts*:** "You might need to try it a different way," "Write your name"
2. ***Gestural prompts:*** pointing to the top of the paper where the learner needs to write his name
3. ***Model prompts:*** Educators perform the target skill or behavior.
4. ***Physical prompts*:** Tapping a learner's hand to cue him to begin writing his name, teacher putting hand over learner's to help her write her name
5. ***Visual prompts*:** Educators provide pictures of events that provide learners with information about how to use the target skill or behavior (e.g., task analysis checklist, transition picture card). Positional prompts may be considered visual.

Prompts must by systematically faded or we end up producing prompt-dependent learners. We must strive constantly toward independence.

EBP: Prompting

Least-to-Most Prompting (on "increasing assistance")

Provide the learner with the opportunity to accomplish the task with any prompts. Then, as needed, provide prompts as needed to accomplish the task or task sequence.



1. The first level provides learners with opportunities to respond without prompts.
2. The remaining levels include prompts that proceed from least to most amounts of assistance.
3. The last level should be a **controlling prompt** - a prompt that ensures that the learner responds correctly.

EBP: Prompting

Graduated Guidance – Fading from a controlling prompt to independent

Educator provides a **controlling prompt** (i.e., a **prompt** that ensures the learner will do the skill correctly) and then gradually remove the prompt during a teaching activity.

This procedure differs from other **prompting procedures** because teachers/practitioners make judgments during the teaching activity based upon the learner's response.

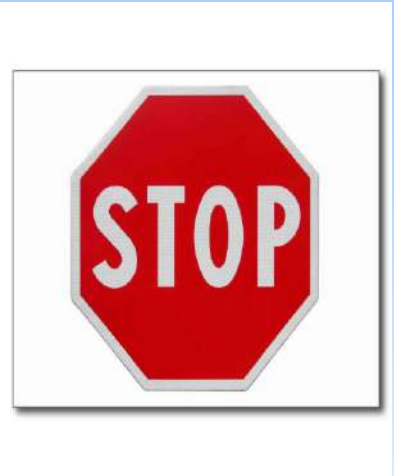
As learners start to use the skills, the prompts are withdrawn, but quickly reinstated if learners regress, or stop using the skills.

This procedure should only be used with **chained skills** that include a physical component (e.g., putting on a coat, washing hands).

EBP: Prompting

Simultaneous Prompting

Alternates **instructional sessions** and **probe sessions.** The instruction sessions provide the cue such as “What is this?” to ask for a stop sign label. Then a controlling prompt is provided as a full verbal prompt; teachers says “Stop!”. Reinforce if correct. Data is collected.



Then in the probe sessions, no prompts are provided to measure progress. Reinforce if correct. Data is collected.

Incorrect responses are ignored; start the next trial.

EBP: Prompting

Sometimes referred to as **errorless learning**

- Minimizes incorrect responses than can produce negative experiences
- Important because of how difficult so many things are for individuals with ASD

Key Guidelines

- Make prompts as minimal as possible; least intrusive.
  - Physical is most intruding, then modeling, the verbal and visual.
- Always target fading – it should be a constant pressure on the adults. Verbal prompts are more difficult to fade than visual

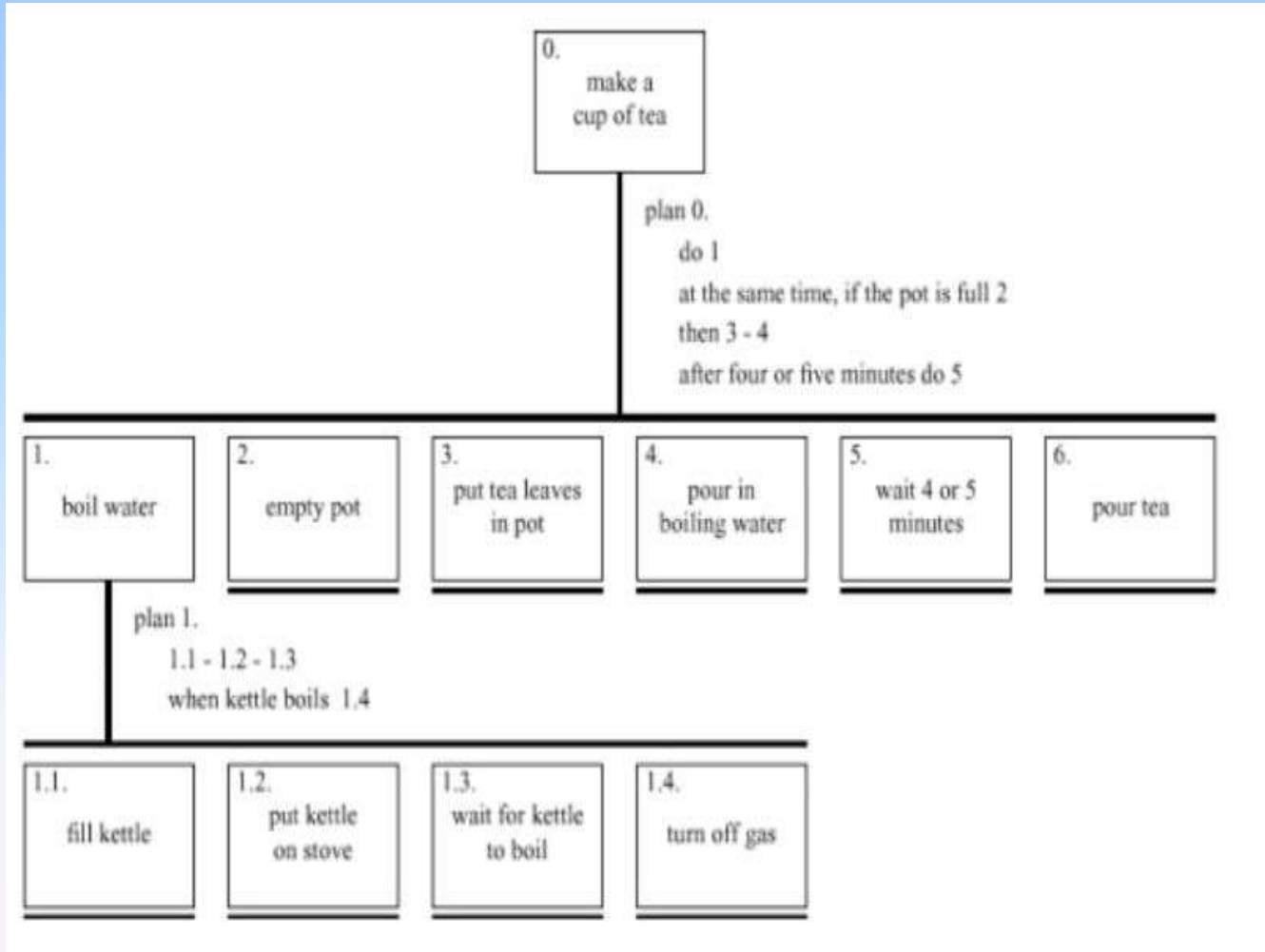
Manualized programs (STAR, PECS) provide specific guidance on prompts and prompt fading.

EBP: Task Analysis

- **Task analysis** is an effective way to plan the teaching of skills that require several steps to be performed in a certain order (**chained behaviors**)
  - Examples: tying shoes, or doing long division mathematics, as well as larger more complex tasks like preparing and serving a meal, or cleaning a cafeteria
- Used in other EBPs; visual schedules, video modeling, social narratives
- Good example of how these instructional techniques **are not discrete**. The are used most effectively in combination with one another.

EBP: Task Analysis

Great example of using a semantic map to task analyze AND provide a visual prompt that is also a visual support



EBP: Task Analysis

- Remember that this approach, like the others, has just as much application for high functioning students with ASD who are simply learning higher level tasks
- Task analysis is frequently used in pre-vocational and work settings to examine skills needed in that particular context so they can be broken down and taught
- Nearly all of the techniques being discussed prepare learners with ASD for "real life" and can be used in competitive work situations – we can teach youth with ASD to even ask for these supports *"I need things broken down for me. I need a visual to go by."*

EBP: Task Analysis

Teaching a **chain of behaviors** – examples: putting on a coat, writing your name

After breaking into component steps, choose method

- **Backward Chain:** Complete first 7 steps already, child completes the 8th. Next time 7th and 8th, and so forth.
- **Forward Chain:** Teach and reinforce step 1. As step one is mastered, move to 2, and so on.
- **Total task:** Learner with ASD simple does the entire sequence with prompts provided as needed. Very common technique. Prompts will have to faded from each step.

EBP: Task Analysis

Task Analyzing completion of Task Analysis:

1. Identify the target skill
2. Identify the prerequisite skills of the learner and the materials needed to teach the task
3. Break the skill into parts (some learners will need more discrete steps than others)
4. Confirm that the task is completely analyzed
5. Determine how the skill will be taught
6. Implement the intervention and monitor progress

EBP: Reinforcement

- Without reinforcement, there is no intervention”
- A reinforcer is any event or stimulus that follows a behavior closely in time and increases the frequency of that behavior (Miller, 2006)
- We shape by systematically and contingently delivering reinforcers to increase the occurrence of target behaviors

EBP: Reinforcement

Types of consequences

	Decreases Likelihood of Behavior	Increases Likelihood of Behavior
Something Presented	Positive Punishment **P+**	Positive Reinforcement **R+**
Something Taken Away	Negative Punishment **P-**	Negative Reinforcement **R-**

EBP: Reinforcement

Why focus on R+ and R- to shape behavior?

- Decades of research support it
- Build confidence and self-esteem
- Strengthens relationships; secondary R+
- Teaching learners what to do versus what not to do; punishment doesn't teach
- Ethical issue "Behavior is Communication"

Comments regarding punishment and extreme or dangerous behaviors

*Some programs use punishment but only for severe self-injurious or other extreme behaviors. Often has to be fully transparent and approved by a regulatory body

Reinforcement Categories

Primary reinforcers: Innately desirable, such as food and water.

Activity reinforcers: Computer time, video game time, TV, etc.

Social reinforcers: praise, hugs, and other positive interactions.

Material reinforcers: toys, games, and other desired items.

Token reinforcers: stickers, stamps, etc. Can be used in a token economy to 'buy' rewards.

Structured Reinforcement Systems can occur at multiple levels – individual, whole-class, etc. Examples…

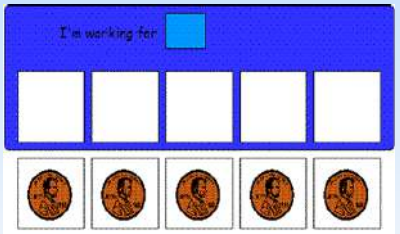
Reinforcement Examples

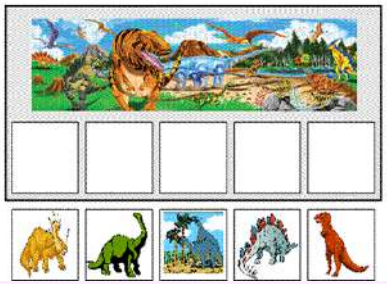
Use of Obsessive Interests

- Research Supported
- Can be more powerful that food reinforcers
- Less likely to become satiated
- Does not increase time spent with obsessive interest

Token Systems

- Used when an established reinforcer is not immediately available following a behavior.
- Token becomes a secondary reinforcer.
- Studies indicate token systems based on obsession are more effective for kids with ASD.





Identifying Reinforcers

- Observe student during free time.
- Ask the student
- Interview parents

Reinforcer Menu

- Will ensure an effective reinforcer is available – preferred items change in value depending on the situation.
- Gives ongoing information on what's reinforcing.
- Provides a visual reminder of the link between an expected behavior and the consequence (reward).

 I want to work
Circle choice for this morning
Time on the Computer
Watch the Ant Farm
Wear Star Wars hat at recess
Get a can of diet soda
Pick a friend to play Connect Four
Notes: *Alex wrote all four sentences!*
Great job! _____ (teacher signature)

Reinforcement Tips from Research

1. Make certain that a reinforcement is contingent on appropriate behavior. When a critical skill is to be taught, it's helpful to reserve a strong reinforcer for when the desired behavior is exhibited.
2. Pair activity on material reinforcers with social reinforcement – as kids with ASD often have to learn the value of smiles, hugs, praise.
3. Take advantage of natural 'built in' reinforcers. (e.g. earning free time after homework). – promotes generalization and don't have to be delivered by adult.
4. Premack Principle – less preferred/more preferred.
5. Remember the value of reinforcers may change – help prevent satiation by using small amounts, using a variety, require several responses, use a tokes system (also consider a reinforcer rotation).

Reinforcement Pitfalls

- Wrong Type of Reinforcement and Satiation
- Wrong Criterion - setting it too high
- Wrong Schedule – frequency or delay is off.
- Arbitrary criterion the adult understands but the child doesn't.
- Cost-Response - effective with some populations, unproven with ASD
- Undermining your own system by being unsystematic example: taking away something already earned

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Thank you!

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