

Applying the Principles of **APPLIED BEHAVIOR ANALYSIS** *In the Classroom*

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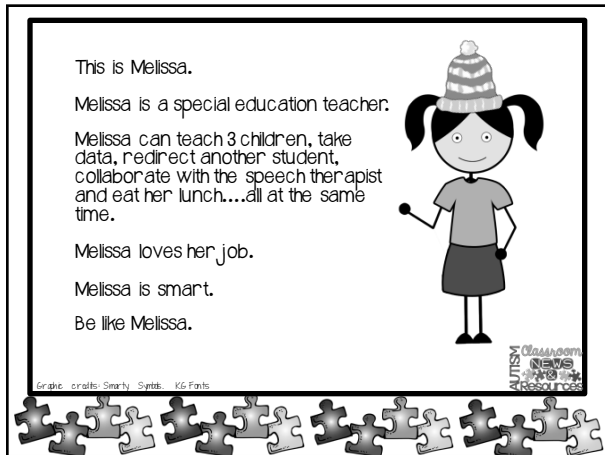
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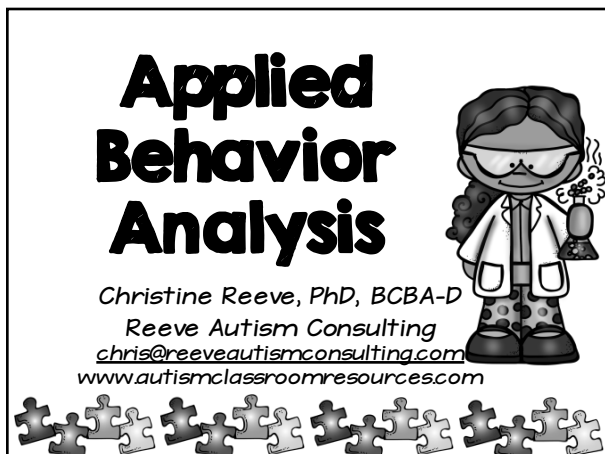
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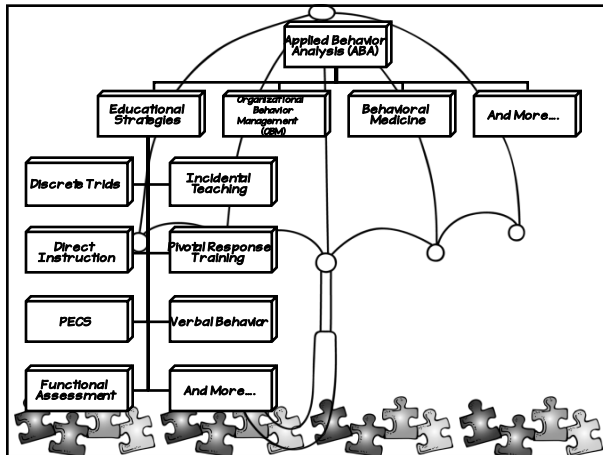




Applied Behavior Analysis

- Applied Behavior Analysis (ABA) is the scientific study of behavior
- Originated with work by B.F. Skinner
- It is a large umbrella under which a number of specific teaching strategies (e.g, discrete trials, incidental teaching) fall
- It focuses on a number of basic principles including:
 - Focusing only on observable behaviors rather than the cognitive interpretations of behaviors
 - Decisions about teaching and programming are based on the individual student's performance and data collected about that performance





ABA and Autism

- ABA has a long association with autism and other developmental disabilities through the approach to addressing challenging behaviors
- Ivar Lovaas published a research study in 1984
 - One group of young children with autism received 40 hours a week of discrete trial training,
 - another group received 10 hours per week of typical preschool intervention,
 - another group was placed on a waiting list with no intervention.
 - The children with 40 hours a week made significantly better gains than the other two groups on IQ, adaptive behavior, and school outcomes.



Impact of ABA on Autism

- Led to the understanding that students with autism need interventions that are intensive and behaviorally based
- Led many parents to push for changes in the way services were delivered to their children with autism
- Led to new beliefs about outcomes for children with autism
- Changed the way early intervention services have been provided to children with autism to include elements of ABA
- Helped us understand how children with autism learn



ABA Since 1987

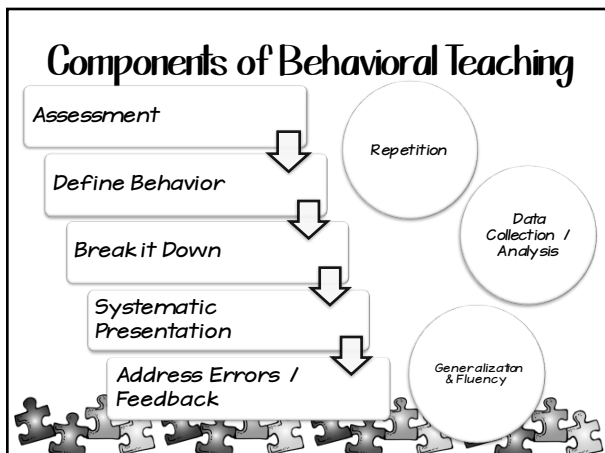
- Applied behavior analysis is a science
- As a science it continues to change and evolve
- New strategies and new techniques have been discovered and researched since Lovaas' study
- Research does tell us that children with autism benefit from the strategies of applied behavior analysis
- Research does not yet tell us who benefits from which strategies



Critical Components of ABA Teaching

- All decisions revolve around the student's performance
 - # of opportunities / trials
 - Pace of instruction
 - Reinforcers
 - Length of teaching activities
 - Proportion of structured to naturalistic instruction time
 - Student ratio
- Must be engaging and interesting—learning should be FUN

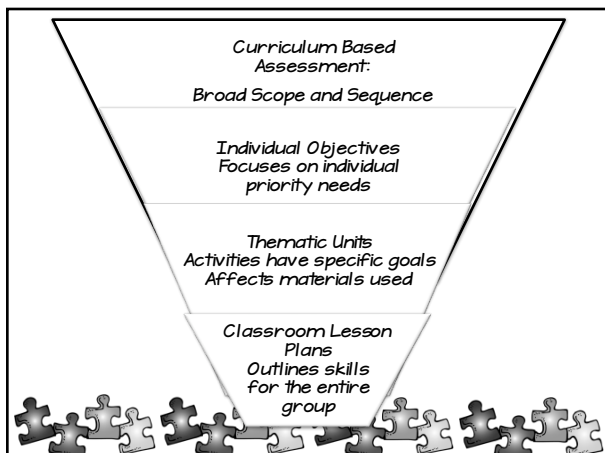




Begins with Assessment

- A strong assessment leads to strong teaching programs
- Makes teaching systematic
- Allows you to collect baseline / pretest data
- Should be:
 - global enough to cover areas needed
 - Age and skill appropriate
 - Detailed enough to teach specific skills

Examples of Curricula



Learning Readiness Skills

- Building blocks of learning
- Allow student to "learn to learn" and take advantage of other teaching methods
- Include:
 - Attending
 - Imitation
 - Following directions
 - Matching
 - Basic receptive and expressive vocabulary

Initial Programs Should Focus on:

- Learning Readiness Skill deficits
- Communication
- Socialization
- Start every teaching session with 3-5 minutes of playing with engaging activities or reinforcers to become a conditioned reinforcer

Steps in Choosing and Defining Target Behaviors

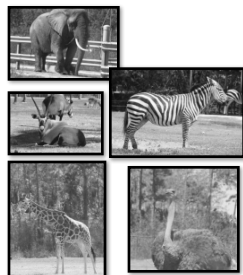
- Choose the behavior
- Define target behaviors in specific terms
- Describe behavior, duration, severity, and frequency
- Prioritize which behaviors to intervene with first



Teach These



NOT These



Identify Goal

- Ensure goal/task/activity is appropriate
 - IEP goal
 - Brigance
 - Functional
 - Developmentally appropriate
 - Pre-requisite skills present
- If not appropriate then identify pre-requisite that would make it appropriate



Creating Good Objectives

- The key to developing programs is to write concrete, well-defined objectives
- Ask
 - What will he do?
 - When will he do it?
 - With whom?
 - Where will he perform the skill?
 - How often does he have to perform to score mastery of the goal?
 - When do you predict he will master it?



Important Variables to Consider

- **Frequency**—how often does it occur?
- **Duration**—how long does it last?
- **Intensity**—how strong is it, is there tissue damage, property damage
- **Relationship to other behaviors**—do other behaviors precede or follow the behavior
- **Inter-response time (IRT)**: how much time elapses between this behavior and the next?
- **Rate**: Take the frequency and divide by the length of observation to get a rate of behavior so you can compare across unequal time period observations



Concrete Objectives



GOOD

Jane will play with 5 toys appropriately and independently in the classroom setting with 2 or more peers on 8 out of 10 trials over a 1 week period



NOT SO GOOD

- Jane will increase toy play
- Jane will play appropriately with toys with her peers



Concrete Objectives

GOOD	NOT SO GOOD
<ul style="list-style-type: none"> • John will initiate verbal interactions (e.g. greetings, requests, comments) with more than 1 adult in the classroom with gestural prompts from staff members for 80% of opportunities presented for 2 consecutive weeks 	<ul style="list-style-type: none"> • John will increase verbal interactions • John will initiate interactions with gestural prompts 80% of the time

Not So Good Goals/Objectives

- Andy will 1) choose a game/toy, 2) choose a friend, 3) play with peers appropriately at 60-70% mastery by the end of the school year
- Andy will participate in social skills training at 50-60% mastery by the end of the school year
- Andy will interactively play with age-appropriate peers and items at 60-70% mastery by the end of the school year

Not So Good Objectives

- The student will demonstrate organizational skills 50-60% mastery by the end of the school year.
- Andy will follow the ___ County Code of Conduct; teacher requests; and class/school rules 60-70% mastery by the end of the school year.
- Andy will move about campus with limited supervision and in pairs with another student while being shadowed by a teacher/paraprofessional 30-40% mastery by end of the school year.



Better Objectives

- Jenny will attend to a task/activity without incident (e.g., tantrum, run away) with visual prompts, in a class situation, up to 25 minutes, on 3 out of 5 opportunities by 5/02.
- Jenny will follow through with a direction that is disliked, without incident, on 3 out of 5 opportunities by 5/02.





Better Objectives

- Jenny will walk (not run) in the halls, with a peer, with visual prompts on 3 out of 5 opportunities in a week by 12/01.
- When requesting a break, Jenny will tolerate a 2 minute delay in getting her break on 4 out of 5 opportunities over 5 school days by 3/02.



Breaking Skill Into Components: Task Analysis



Prepare Task Analysis

- Break skill down into component parts (pinpoints)
- List all skills to be taught in order
- Address acquisition of each skill separately or in sequence as appropriate
 - Compound skill=separately
 - Chain skill=sequence



Task Analysis Example

- Compound skills
 - Teach one skill
 - Then teach another skill
 - Then mix



Receptive ID of Common Objects

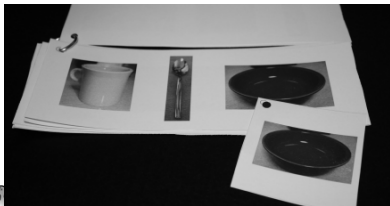
- 1. Identifies first object (3 correct consecutive trials).
- 2. Identifies next object (3 correct consecutive trials)
- 3. Identifies learned objects randomly (2 days at 80%).
- Repeat steps 2-3 for each object



Alternative Program Matching Items

Program Steps: Present the following steps until the student gets each step correct for at least 8/9 trials for 3 consecutive blocks and then move to the next step.

1. Matches identical objects of bowl, cup, and spoon in 3-item array.
2. Matches identical objects of shoe, car and block in 3-item array.
3. Matches identical objects of all 6 objects in 6-item array.



Data Sheet

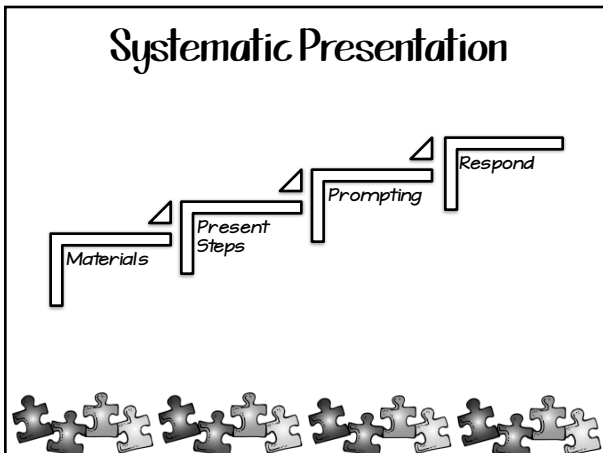
Trial	Receipt ID 1A, Block 1			Prompt
1	Bowl	Cup	Spoon	
2	Cup	Spoon	Bowl	
3	Spoon	Bowl	Cup	
4	Bowl	Cup	Spoon	
5	Cup	Spoon	Bowl	
6	Spoon	Bowl	Cup	
7	Bowl	Cup	Spoon	
8	Cup	Spoon	Bowl	
9	Spoon	Bowl	Cup	



Task Analysis Example

- **Chain skill**
 - Skill in which the steps must occur in sequential order
 - Ex. Getting dressed, brushing teeth
 - Forward chaining
 - Teach first step first
 - Backward chaining
 - Teach last step first





- ### Structured Program
- Prepare materials in advance
 - Plan (outline) the sequence of training
 - Allows for logical progress
 - Prepared for taking steps back or forward
 - Keeps you from skipping pre-requisite skills
 - Plan use of prompts, error correction, reinforcement, data collection, etc
 - Keep appropriate pace of instruction
 - Keep activity enjoyable



Prepare Materials



Prepare Materials for Table Work

- *Make sure you have:*
 - *Teaching stimuli / materials*
 - *Teaching program*
 - *Data collection form*
 - *Pen*
- *Prepare BEFORE bringing the child to instruction*
- *Make materials engaging and interesting*
- *Vary materials frequently*



Prepare Materials for Incidental Opportunities

- *Make sure materials are fun and engaging*
- *Set up materials that you know the student will be attracted to*
- *Create opportunities for learning by already withholding or sabotaging the situation BEFORE the student goes to engage with the materials*



Teach Enough Examples

- *Teach sufficient exemplars or training diversely*
 - *How many is enough?*
 - *Do this across people, settings, objects, behaviors*
- *Teach multiple stimulus examples, teach multiple response examples, general case analysis, and negative teaching examples*



Teach Enough Examples

- *Stimulus examples*—Teaching the word cup—how many examples are enough?



Teach Enough Examples

- *Response examples*—Response to greeting includes "Hi," "Good morning," "Good to see you"
- *General case analysis*—teach examples that represent a full range of stimulus situations and response requirements in the natural environment
- *Negative teaching examples*—teach when not to use a newly learned behavior (don't clear the table when people are still eating)



Present Steps Systematically and Clearly



Shaping

- Reinforce successive approximations
 - Reinforce each subskill
 - Reinforce improvements in accuracy
 - Reinforce longer periods of performance
 - Reinforce longer periods of participation
- Skill builds on itself
- Each step replaces the one before it



Example of Shaping

- Target Behavior: Child will remain in a group activity for 10 minutes
- Mastery criteria: 3 activities with no prompts to remain
 - Child stands behind his seat at group activity for 5 seconds
 - Child sits in his chair at beginning of group for 5 seconds
 - Child sits in his chair for 30 seconds of a group activity
 - Child sits in his chair for 1 minute of a group activity
 - Child sits in his chair for 2 minutes of a group activity
 - Child sits in his chair for 5 minutes of a group activity
 - Child sits in his chair for 8 minutes of a group activity
 - Child sits in his chair for 10 minutes of a group activity



Principles of Shaping

- Size of steps should be tailored to individual's needs
- Steps too big = Too many errors
- Steps too small = Slower learning
- Gradually up the ante when subskills are mastered



Forward Chaining

- Appropriate for individuals who are able to follow instructions
- Skill is taught from beginning to end
- Several steps are required before individual gains access to reinforcer
- Most "common" form of training



Backward Chaining

- Appropriate for individuals who are not able to follow directions
- Last skill is taught first
- Initially only one step required before gaining access to reinforcer
- Very effective without relying on instructions



Total Task Presentation

- Each step is taught during every teaching session until the entire chain is mastered
- Each step is reinforced until mastered when reinforcement must be faded
- All steps taught in correct sequence
- More training time is required to practice each step, increasing total training time



Task Analysis Example

- Hand Washing
 - Turn on water
 - Wet hands
 - Get soap
 - Rub hands
 - Rinse hands
 - Turn off water
 - Dry hands
- Where do you begin?
 - Forward chaining?
 - Backward chaining?



Some Other Methods of Systematic Instruction

- Discrete trial training
- Pivotal Response Training (PRT)
- Incidental Teaching
- Direct Instruction



Presenting Tasks for Acquisition

- Assure you have the student's attention to you and to the task at hand.
- Inform the student of the objective of the task either through words, pictures / visual cues, or models.
- Present the instructions in a clear manner focusing on the student's learning style.
- Provide instructional prompts to help the student be successful.
- Reinforce the desired behaviors.



Prompting: Getting the Right Response

- Prompting is used to help the child succeed and reach the reinforcer
- We use it more when we are teaching a new skill
- Want to fade it out as the child gains mastery



Physical Prompt

- Physically guiding the learner's hands to complete the task.
- Often called hand-over-hand.
- The most intrusive prompt

Gestural Prompt

- Using a gesture, like pointing or reaching, to give information about the correct response or remind

Positional Prompt

- Placing materials in a manner to give information about the answer (e.g., placing the answer closer to the student)

Verbal Prompt

- Telling the learner the answer
- Giving a verbal cue, like the beginning sound of the answer
- Giving the direction more than once

Visual Prompt

- A picture or cue that the student sees giving information about the right answer.
- Flashing a card with the right answer
- A visual schedule



Prompting and Autism

- Students with autism often become prompt dependent—wait for a cue or prompt for everything
- We have to take the responsibility to get those prompts out of there but still have the child succeed
- We must plan to fade our prompts or use natural prompts that can exist in the environment



Using Natural Prompts

- Visual cues can be natural prompts or cues for a student to do what he needs to do
- They can be unobtrusive and help the child to be independent
- The student is more dependent if he has to depend on you than if he can use a picture schedule or other system to help himself
- You want to teach the student to help himself
- Examples: picture task analyses, schedules



Natural Prompts in Our Lives

- Police cars sitting at stop signs to remind people to come to a full stop
- That magnet on the refrigerator that reminds us we should eat something healthy instead of junk
- Our agendas and daytimers



Fading Prompts

- You must plan to fade prompts to promote independence
- Many different strategies to fade prompts
- Effectiveness of strategies dependent upon the student

-Most-to-Least	-Least-to-Most
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Prompts	Prompts
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-Graduated	-Time Delay
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Guidance	-Stimulus fading
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-Shadowing	-Stimulus Shaping
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-Spatial Fading	
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Prompting Strategies

- Determine the prompt fading strategy and **WRITE IT DOWN** on the program
- Remember to step back from the student when waiting for independence
 - Give cues that you expect independence
- Make sure you have the child's attention before using the prompt
- Use prompts that help the student notice naturally occurring prompts



Time Delay

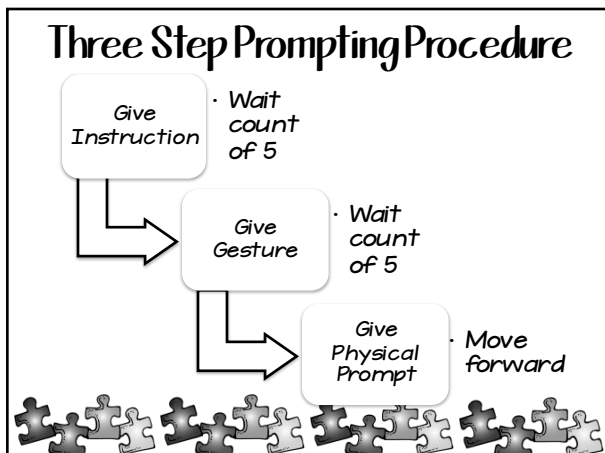
- Constant time delay always uses the same length of time
- Progressive time delay increases time from short to longer delay
- Very useful for tasks that you can't use physical prompts and particularly for verbal skills

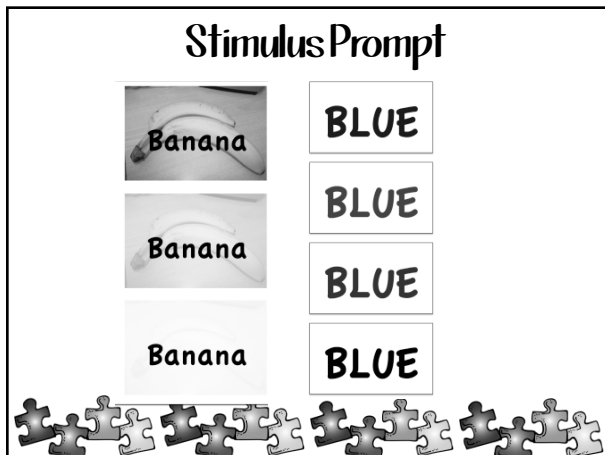


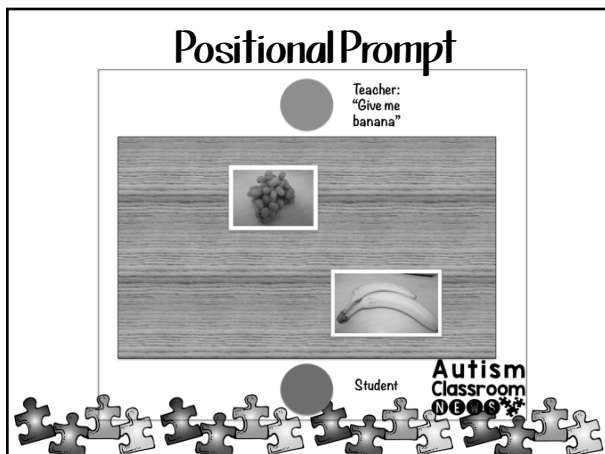
Stimulus Control

- Environmental stimuli used will gain control over responding
 - If training occurs in the same place, time, and with the same materials then responding will be under tight stimulus control
 - Student will learn that he/she should respond only to those materials, or in that setting, or at that time.
 - However, some degree of stimulus control is necessary for instruction to be effective










Consequence

Correct Response → **REINFORCER!!**

Prompted Response → **REINFORCER!!**


Incorrect Response → ~~**REINFORCER!!**~~



Reinforcement


- Giving or removing something that increases the frequency of the behavior in the future
- Token boards, edibles, special opportunities, or the opportunity to skip something like homework can all be reinforcers

Kucharczyk, S. (2013). Reinforcement (Rv) fact sheet. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, The National Professional Development Center on Autism Spectrum Disorders.




Reinforcement

- Important to use powerful reinforcers
 - This is extremely important during initial acquisition of skill
- Important to make self and activity a reinforcer
 - Will help minimize avoidance of task
- It may be necessary to assess for reinforcer
 - Reinforcers can be very individualized
- It may be necessary to vary the reinforcer
 - Will help avoid student getting "bored" with the reinforcer
- Pair powerful reinforcers with praise
 - Will help with fading out more powerful reinforcers in favor of social reinforcers



Reinforcer Assessments

- Ask the student
- Ask the family / caregivers
- Observe
- Analyze




Ask the Student

Reinforcement Inventory for Children

DESCRIPTION OF POTENTIALLY REINFORCING EVENTS	NOT AT ALL	A LITTLE	A FAIR AMOUNT	MUCH	VERY MUCH
A. FOOD ITEMS					
1. Candy					
a. What Kind?					
b.					
c.					
2. Ice Cream					
a. What Kind?					
b.					
c.					
3. Nuts					
4. Potato Chips					
5. Cakes					
6. Cookies					
7. Beverages					
a. What Kind?					
b.					
8. Other Foods					
a.					
b.					
c.					
d.					

<http://www.autismclassroomresources.com/d2f>



From PENT in California—includes one for the student and one for the family

Ask the Family

Potential Reinforcer Profile

Child's Name: _____ Date: _____

Name of Reporter(s): _____ Escambia County, FL

Instructions: From each category, check 10 of the preferred items for your child. If items are not listed, list as preferred by your child, please write down items under "Other".

Visual Reinforcers

<input type="checkbox"/> TV screen	<input type="checkbox"/> Paper fan	<input type="checkbox"/> Fan
<input type="checkbox"/> Computer games	<input type="checkbox"/> Balloon	<input type="checkbox"/> Paper airplane
<input type="checkbox"/> Video games	<input type="checkbox"/> Book	<input type="checkbox"/> Toy car
<input type="checkbox"/> Handwritten notes	<input type="checkbox"/> Clock & calendar	<input type="checkbox"/> Toy train
<input type="checkbox"/> Printed notes	<input type="checkbox"/> Toy truck	<input type="checkbox"/> Toy airplane
<input type="checkbox"/> Labels	<input type="checkbox"/> Toy car	<input type="checkbox"/> Toy truck
<input type="checkbox"/> Labels	<input type="checkbox"/> Toy car	<input type="checkbox"/> Toy truck
<input type="checkbox"/> Toy car	<input type="checkbox"/> Toy truck	<input type="checkbox"/> Toy airplane
<input type="checkbox"/> Toy airplane	<input type="checkbox"/> Toy truck	<input type="checkbox"/> Toy airplane

List other: _____

List other: _____


Auditory Reinforcers

<input type="checkbox"/> Music (CD)	<input type="checkbox"/> Singing songs	<input type="checkbox"/> Car radio
<input type="checkbox"/> Radio with sound effects	<input type="checkbox"/> Music (mp3)	<input type="checkbox"/> Radio
<input type="checkbox"/> White noise	<input type="checkbox"/> Pure tones	<input type="checkbox"/> Music
<input type="checkbox"/> Car horn/beep tone	<input type="checkbox"/> Clapping	<input type="checkbox"/> Musical instruments
<input type="checkbox"/> Music box	<input type="checkbox"/> Whistles	
<input type="checkbox"/> Whistle	<input type="checkbox"/> Whistles	
<input type="checkbox"/> Whistles	<input type="checkbox"/> Whistles	

List other: _____

List other: _____

<http://www.autismclassroomresources.com/f5vk>



Reinforcer Interview

Jackpot! A service of www.autismclassroomresources.com

Reinforcer Survey

Directions: Review each of the items below with your student. For each item, mark whether the student finds it to be a preferred reinforcer or reward.

The student finds the item _____ *The student will be appointed timekeeper for an activity, announcing a 5-minute warning near end of the activity, and informing the group when the activity is over.*


The student finds the item _____ *The student will spend time (with appropriate supervision) on the Internet at academic sites.*

The student finds the item _____ *The student will read aloud to the class.*

The student finds the item _____ *The student will select a class learning activity from a list of choices.*

The student finds the item _____ *The student will read a story aloud to younger children.*


<http://www.autismclassroomresources.com/zama>



*Jackpot
Reinforcer-
Customizable from
Intervention Central*


Reinforcement

- *Important to use reinforcement systematically and carefully*
 - Reinforce more independence
 - Reinforce correct responding
 - Avoid reinforcing participation, unless participation is the goal itself
 - Avoid using reinforcers as "bribes" to coerce behavior



Reinforcement

- *Important to use powerful reinforcers*
 - This is extremely important during initial acquisition of skill
- *Important to make **self** and activity a reinforcer*
 - Will help minimize avoidance of task
- *It may be necessary to assess for reinforcer*
 - Reinforcers can be very individualized



Reinforcement

- It may be necessary to vary the reinforcer
 - Will help avoid student getting "bored" with the reinforcer
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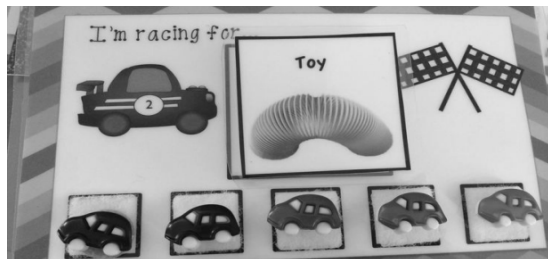


Reinforcement

- Use reinforcers related to the outcome of the routine
 - Intersperse favorite activities for a child in circle to reinforce remaining in the group
 - Choose materials that are reinforcing to the child
 - Arrange the schedule so that the activity following the teaching activity is something the child likes to do (e.g. computer for completing independent work)
- Use natural reinforcers
 - put a sweater on in a cold room
 - put shoes on to go outside



Token Systems



Fading Reinforcers

- Reinforce on an intermittent schedule
 - note this on the program or data sheet for all staff specifying how often
- Reinforce at the end of a segment or chunk of the routine rather than each skill
 - After he puts his backpack up rather than after he comes into the room
- Reinforce larger and larger chunks of the routine moving toward reinforcing only at the end
- Try to move toward using social reinforcers ONLY when the child is independently completing the routine with NO prompts



Handling Errors



Error Correction Procedures

- Determine what type of error correction procedure you are going to use before beginning the learning program.
- Error correction refers to the assistance provided by teachers after student responds incorrectly
- If you prompt the student to avoid making mistakes (i.e., errorless learning) you will not need to correct errors.



Common Error Correction Procedure

- Instruction followed by prompt followed by correct response eliminates need for error correction
- Instruction followed by incorrect response, followed by instruction and prompt for correct response immediately
- Instruction followed by incorrect response followed by "no" and prompt for correct response.



Programming for Generalization

- Generalization occurs when a student demonstrates a response in an appropriate situation where instruction did not occur and does not demonstrate the response in inappropriate situations



An Example to Ponder

- The word "cup"
 - How many examples are there? Do glasses, mugs, water bottles count in this category?
 - Colors, shapes, sizes, with sippy tops, with straws sticking out, materials made of
 - Used at home, school, restaurants, at grandma's house
 - At snack time, with breakfast, at lunch, at dinner, before bedtime
 - With water, juice, soda, milk inside



Types of Generalization

- **Stimulus Generalization**
- Response demonstrated across one or more untrained situations (e.g., across staff, across settings)
- **Response Generalization**
- Response demonstrated is slightly different than the trained one (e.g., using speech instead of sign to request a break)
- **Generalization across time (Maintenance)**

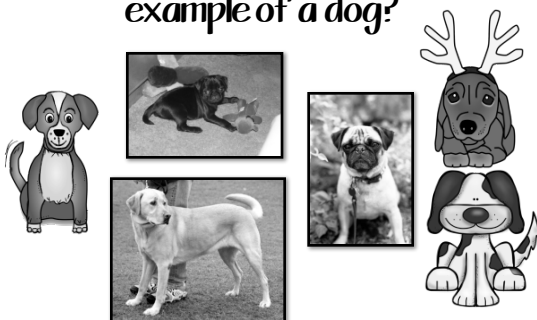


Principles of Generalization and Maintenance

- Teach and reinforce a variety of settings with a variety of people and materials
- Train sufficient exemplars
- Enough to represent both the common and diverse characteristics of the stimulus and response
- concurrently



Which picture(s) is/are the best example of a dog?

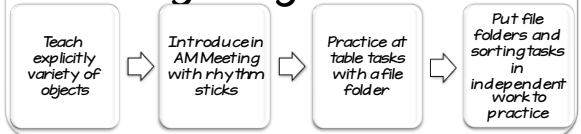


Generalization / Maintenance (cont.)

- Program common stimuli
 - At home/school/therapy
 - To make transitions between classes
- Introduce to naturally maintaining contingencies
 - Pair instructional and natural reinforcers and fade instructional ones



Teaching Rough and Smooth



Teaching Greetings





Generalization / Maintenance (cont.)

- Train loosely
 - vary the components of the instructional plan slightly from time to time
- Teach to fluency
- Increase frequency of reinforcement when training across settings and then thin schedule gradually




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Discrete Trials




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Discrete Trials

- Popularized by Lovaas in 1960s
- Present the student with discrete (unique) trials (opportunity) in which to respond
- Controlled environment
- Controlled materials
- High degree of stimulus control
 - Benefit or drawback?



Discrete Trials	
Pros	Cons
<ul style="list-style-type: none"> • High degree of stimulus control • Difficult to get generalization 	<ul style="list-style-type: none"> • High degree of stimulus control • Systematic skill building • Good rate of acquisition



Discrete Trial Components

- Establish attending behavior
- Sd (Discriminative Stimulus)
- Prompt (If needed)
- Student's Response
- Consequence for response
- Intertrial Interval



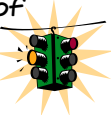
Attending Behavior

- Visual attention--looking at you
- Listening
- Assure you have attention before presenting trial
- If student is not attending, use some type of reinforcer to get his attention and then begin trial



Sd-Discriminative Stimulus

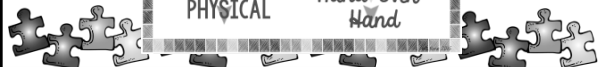
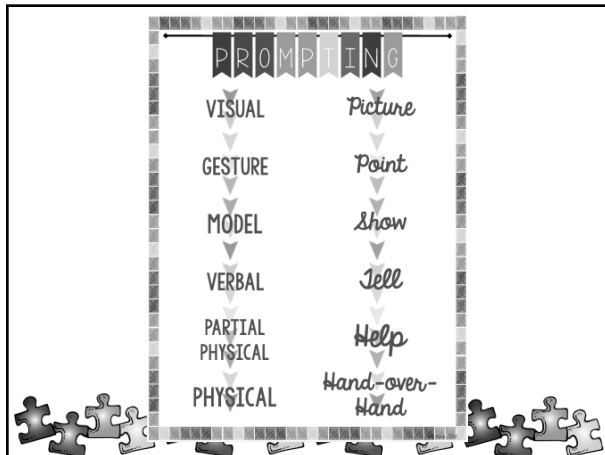
- Stimulus that elicits target behavior
- Verbal direction--should be clear and concise
- Consider just using the key word needed (e.g., "green" instead of "touch green")
- Visual presentation of object



Prompt

- Ensures correct responding so that behavior can be reinforced
- Used more frequently when teaching new skill
- Must plan to fade prompts in a systematic fashion
- Aim to use the least intrusive prompt possible





Why Prompts are Like Training Wheels

You Always Need to Fade Them Away



Student Response

- Student emits a response
- The likelihood of that response occurring again is determined by the consequence
- Student will only respond based on learning history
- Treat each response as a mini assessment of where skill is
- Must be prepared for all possible student responses



Types of Responses

- Independent (+)
- Visual (I)
- Gestural (G)
- Positional (O)
- Verbal (V)
- Model (M)
- Physical (P)
- Incorrect (--)




Independent (+)




- No help was given
- Response was correct
- Results in high levels of reinforcement and praise




Visual (I)




- Response was after:
 - A picture was flashed or shown as a cue
 - A picture list was followed
 - Some type of visual medium assisted the student



Gestural (G)




- Response occurred after:
 - A point
 - A wave
 - Some type of gesture from the adult
 - Does not include a full model of the action



Positional (O)


Teacher

Give me the car



Student

- When the response follows:
 - Specific arrangement of materials to facilitate correct response
 - Put the right answer closer to the student
 - Move the wrong answer out of the student's line of vision



Verbal (V)

- When the response follows:
 - The teacher saying the answer
 - The teacher saying part of the answer or giving another verbal cue like a clarifying question
- Is the easiest to use
- The hardest to fade
- Avoid using verbal if there are other cues that will be effective



Model (M)

- The child's response follows:
 - The adult demonstrating the whole action
 - A peer demonstrating the action
- Must have the student's attention for them to be effective
- Student must be able to imitate for models to be effective



Physical (P)



- The student's response followed:
 - The adult providing some type of physical assistance that involved touching the student
 - Hand over hand
 - Partial hand over hand



Incorrect(--)

- The child did not respond or responded with the wrong answer
- In general, we try to avoid getting incorrect responses
- If there is no response, provide a prompt
- If you get an incorrect response, remove the materials and represent the trial with a prompt



Consequence

- Event that happens to the individual following his response
 - reinforcement
 - lack of consequence



Reinforcement

- Important to use powerful reinforcers
 - This is extremely important during initial acquisition of skill
- Important to make self and activity a reinforcer
 - Will help minimize avoidance of task
- It may be necessary to assess for reinforcer
 - Reinforcers can be very



Reinforcement

- It may be necessary to vary the reinforcer
 - Will help avoid student getting "bored" with the reinforcer
- Pair powerful reinforcers with praise
 - Will help with fading out more powerful reinforcers in favor of social reinforcers



Reinforcement

- Reinforce attempts at communication
 - rather than shaping successive approximations, reinforce attempts to get what they want
- Use token systems when appropriate for the student
- Use primary, sensory, or activity reinforcement dependent upon what works for the student



Reinforcement

- Use reinforcers related to the outcome of the routine
 - Intersperse favorite activities for a student in morning meeting to reinforce remaining in the group
 - Choose materials that are reinforcing to the student
 - Arrange the schedule so that the activity following the teaching activity is something the student likes to do (e.g., computer for completing independent work)
- Use natural reinforcers
 - put a sweater on in a cold room
 - If they ask for a banana, give them a banana



Fading Reinforcers

- Reinforce on an intermittent schedule
 - note this on the program or data sheet for all staff specifying how often
- Try to move toward using social reinforcers ONLY when the student is independently completing the routine with NO prompts



Errors

Prevent Errors

- DEFAULT position- START HERE
- Arrange the environment and materials so errors are less likely
- Use cues and then fade them out
- For children who have difficulty when told "no"

Correct Errors

- For children who benefit from feedback of correction
- For children who wait for someone to prompt them
- For children who have difficulty with prompt dependence
- For verbal programs
- Decide how this fits in with trials- readminister? distracter trial?



Feedback Error Correction vs. Errorless

- Both have been shown in the literature to be effective
- Error correction may not give child with autism useful information
- Errorless training produces less emotional behavior since each trial ends in reinforcement
- Errorless may be counterintuitive



Intertrial Interval

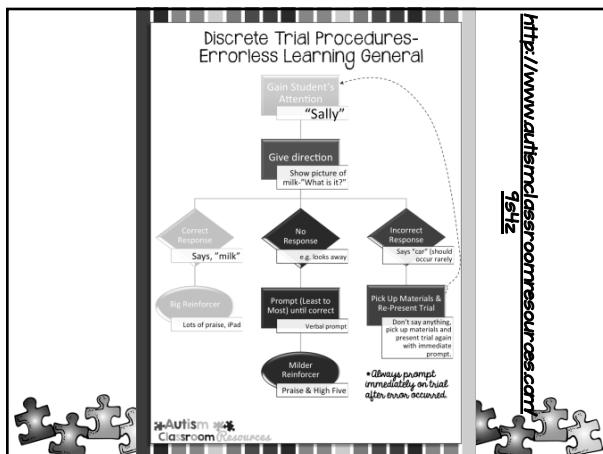
- Brief period of time between the consequence of the last response and the next Sd
- Can include:
 - another student's trial
 - Another activity
 - Playing with or consuming reinforcer
 - Data collection
- May be brief before onset of next trial or may be longer when trial is embedded in other activities.
- Need to pay attention to pace of instruction

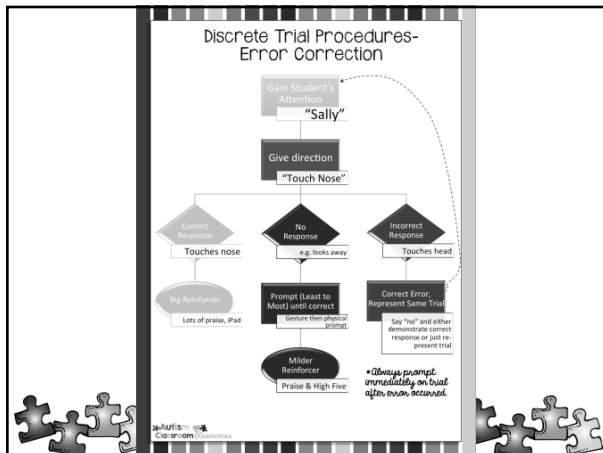


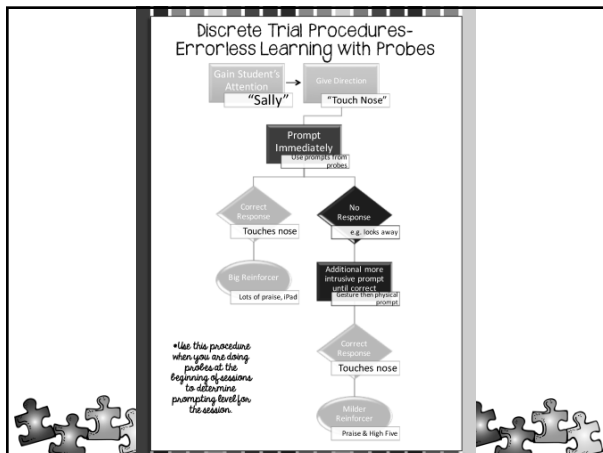
Distracter

- An additional object, sound, etc. that is given as a second option for a response to distract the student from the correct response
- Used to assure that student is responding correctly to the task and not just providing the same rote answer
- Gives the student another choice









Generalization


- Generalization is the key to effective instruction
- Skill must occur outside training setting
- Use instructions that mirror the natural environment
- Plan for generalization
 - Use materials that will be found in the natural environment
 - Use several exemplars
 - Vary stimuli

Putting it Together in Programs




Three Formats of Programs


- **First, Next, Random**
 - One item alone, next item alone, learned items randomly
- **Distracters**
 - One object alone, object with distracter, 2nd object alone, 2nd object with distracter
- **Arrays**



First, Next, Random



- Imitates first action (3 consecutive correct trials)
- Imitates next action (3 consecutive correct trials)
- Imitates learned actions randomly (18 out of 20 trials independent)
- Repeat steps 2 & 3 for each action.



Disctractors

- Gives 1st object alone
- Gives 1st object w/ distracter
- Gives 2nd object alone
- Gives 2nd object w/ distracter
- Gives 1st and 2nd object presented randomly together
- Gives 3rd item only
- Gives 3rd item with distracter (vary location)
- Gives all learned items in field randomly and gives item when asked (2 days at 80%)
- Continue adding 1 new item until at least 5 items are taught; return to step 6 and rotate items into field of 5
- (mastery criteria is 3 consecutive correct trials unless otherwise specified)



Arrays

- Based on Grow & LeBlanc
- Sets of at least 3 items, counterbalanced so you are always presenting them in different positions
- Avoids teaching response sets

TRIAL	ITEMS	RESPONSE
1	Block	Block
2	Block, Spoon	Block
3	Block, Spoon, Cup	Block
4	Block, Spoon, Cup, Bowl	Block
5	Block, Spoon, Cup, Bowl, Shoe	Block
6	Block, Spoon, Cup, Bowl, Shoe, Car	Block
7	Spoon, Cup, Bowl, Shoe, Car, Block	Spoon
8	Spoon, Cup, Bowl, Shoe, Car, Block, Block	Spoon
9	Spoon, Cup, Bowl, Shoe, Car, Block, Block, Block	Spoon

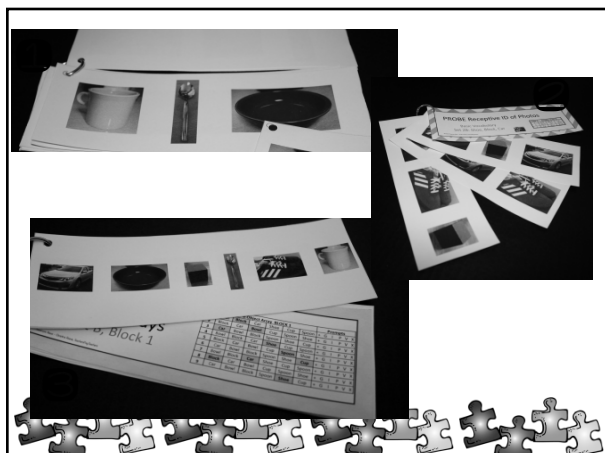


Arrays

Program Steps: Present the following steps until the student gets each step correct for at least 8/9 trials for 3 consecutive blocks and then move to the next step

1. Matches identical objects of bowl, cup, and spoon in 3-item array.
2. Matches identical objects of shoe, car, and block in 3-item array.
3. Matches identical objects of all 6 objects in 6-item array.





Advantages of Arrays

- Assure that materials are presented in a consistent manner to the student to avoid errors being made because of the order the materials were presented, where the materials were placed or how they were constructed.
- Easy to hand off to staff to implement with consistency





Important Elements to Remember

- If not using arrays, move the items around with each trial
- Use multiple pictures/objects for each target (e.g., multiple pictures of bowl, spoon, cup) or plan to generalize afterward
- Remember to reinforce with meaningful reinforcers
- Choose materials that provide different qualities (e.g., size, color) of the same objects
- Keep your words consistent in early programs and then change them up
- Consider saying just the relevant word (e.g., "green") instead of "touch green".




Naturalistic Instruction in ABA

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Naturalistic Instruction

- Pivotal Response Training (PRT)
- Incidental Teaching (Situational Sabotage)
- Natural Environment Teaching (NET) in Verbal Behavior Approaches



Pivotal Response Training

- Focuses on specific behaviors found to be pivotal to wider spread acquisition and generalization of skills
 - Motivation
 - Responding to multiple cues
 - Self-management
 - Initiations
- Child-directed strategy
- Used in naturalistic settings
- Provides many frequent opportunities for the skill



History of PRT

- Adaptation of DTT to increase opportunities in the natural environment and incorporate research that indicated the need for functional reinforcers and to teach for generalization
- Began as the Natural Language Paradigm
- Focuses mainly on play, social, and communication skills



Effectiveness of PRT

- Koegel et al. (1999) found that young children who received PRT had regular education placements and did not qualify for special ed after treatment; also didn't have a diagnosis of autism post-tx
- Increases in interactive and pretend play skills (Humphries, et al., 1998; Pierce, 1996; Pierce & Schreibman, 1995)
- Increases in language (Koegel et al., 1992; Laski et al., 1988; Sze et al., 2003; Thorp et al., 1995)



Pivotal Response Training

- Works well with skills that are more spontaneous in nature (e.g., communication, social skills)
- Sometimes called "massed incidental teaching"
- Includes up to 50% maintenance tasks interspersed with new tasks to maintain motivation and student engagement



Steps of PRT

- Student chooses activity
- Teacher restricts access to preferred item/activity
- Teacher provides opportunity (waiting) for student respond
 - Teacher provides a cue or a prompt if needed
- Student responds
- Teacher evaluates response and provides consequence (e.g., access to activity)
- Teacher provides pause and observes student to determine next step



Example of PRT

- Cue:
 - Student reaches for a toy car on the track; student wants to spin the wheels
 - Teacher, holding car, says, "Do this," and pushes the car
 - Response:
 - Student imitates teacher's action and pushes the car
 - Consequence:
 - Teacher lets the student hold the car and spin the wheels as a reward for pushing it appropriately
 - Pause:
 - Student continues to play with car for 5 to 10 seconds
 - Teacher observes level of play to prepare for next response opportunity
- Arick, Loos, Falco, & Krug (2004). The STAR Program Manual, p. 88



Characteristics of the Steps

- Instructions / Opportunities
 - Clear, uninterrupted
 - Appropriate / related to the activity
 - Include child choice
 - Interspersed with maintenance tasks
- Reinforcers:
 - Contingent and delivered quickly
 - Reinforce ATTEMPTS
 - Functionally related to the behavior and situation



Specifics of the Steps



Presenting the Question/ Instruction/ Opportunity to Respond

- *The child must be attending BEFORE you begin the opportunity / give instruction*
- *Opportunity should be clear to the student*
 - *Use exaggerated affect*
 - *Highlight specific characteristics*
- *The opportunity should be appropriate to the task*
 - *e.g., working on toy play in the play area*



Intersperse Maintenance Tasks with New Tasks

- *Increases motivation and self-confidence*
- *Maintains student engagement in activity*
- *Gets behavioral momentum to increase likelihood of tackling the novel more difficult tasks*



Shared Control / Turn Taking

- Increase motivation for the activity by giving the child choices and ways to control the activity
 - Choose a toy to play with (and thereby talk about)
 - Choose to terminate an activity by saying, "no more" or "Put car away"
- Try to comply with the child's wishes if you can to reinforce the communication and keep student engaged
- Do not allow the child to choose activities that are hazardous or unacceptable (e.g, self-stimulation)



Turn Taking

- Give and take interaction between the child and therapist that takes place while they are involved with the activity the child has chosen
- Child and adult take turns rolling the car, describing and racing the car
- Allow adults to provide appropriate language model
- Allow child to learn give and take of social interactions



Responsivity to Multiple Cues

- Children with ASD have difficulty attending to multiple cues at the same time
 - pointing and verbal direction
 - Red pen (not red pencil or blue pen)
- Most efficient way to teach children to attend to more than one cue is to choose instructions/tasks that REQUIRE them to use multiple cues
- Allows them to learn more from their environment



Reinforcement Must Be Contingent on Behavior

- ANY response to the child's behavior must be contingent on the correct behavior or an attempt
- Immediate as possible after the response
- Appropriate to the context and response
- Dependent upon the response
- For new responses, the reinforcement should be every time; later you can space out the reinforcement



Reinforce Attempts and Approximations

- Any goal-directed attempt to respond to questions, instructions or opportunities should be reinforced
- Increases motivation to respond
- Must be a reasonable attempt and fit with progress made in the past
- Child must be directing his/her attention to the task
- Attempt has to be related to the task
- Has to be emitted with a reasonable amount of effort



Direct Response-Reinforcer Relationship

- Reinforcer should be a natural consequence for the behavior
- If the child says "Car" he should be allowed to play with the car, not given a piece of candy
- Strengthens connections of communication with actions



Level I PKI Lesson in SIAR EXPRESSIVE LANGUAGE Lesson I: Babbling and Sound Pairing

- **Lesson Objective:** To increase student's frequency and variability of sounds used in response to teacher's verbal cue
- **Babbling:** when the child produces any sound that can be written phonetically (e.g, da, eee, wa) but is not an intelligible word
- **Sound Pairing:** involves same sounds as babbling, but requires the child to utter these sounds FOLLOWING the teacher's verbal cue; it is preparation for verbal imitation; sounds do not have to resemble the verbal cue



Pivotal Response Training Pros Cons

- | | |
|--|---|
| <ul style="list-style-type: none"> • Naturalistic • Promotes generalization and maintenance • High levels of student engagement • Teaches flexible skills • Good at teaching spontaneous skills • Effective for play, social, and communication skills | <ul style="list-style-type: none"> • Difficult to create frequent opportunities • Takes longer to acquire skills • Harder to train staff to implement • For disconnected students might be harder to engage • Data collection more difficult |
|--|---|



Integrating Best Practices in ABA



This is Melissa.


Melissa is a special education teacher.

Melissa can teach 3 children, take data, redirect another student, collaborate with the speech therapist and eat her lunch....all at the same time.

Melissa loves her job.

Melissa is smart.

Be like Melissa.



Graphic credit: Smarty Symba, K&Farts

AutismClassroomResources.com

Changes in DTT

- *“More naturalistic tone*
- *Programming for generalization*
- *Not just blocks of trials*
- *Use of interspersals*
- *Shorter inter-trial intervals*
- *Use of errorless learning strategies”*

» --Mary Jane Weiss (2008),

Discrete Trials vs. Naturalistic Instruction

• <i>Discrete Trials</i>	• <i>Naturalistic</i>
• <i>Teacher-directed</i>	• <i>Child directed</i>
• <i>Easy to train</i>	• <i>Better generalization</i>
• <i>Lots of repetition</i>	• <i>Builds on motivation</i>
• <i>Systematic</i>	• <i>More effort to train</i>
• <i>Assures multiple opportunities</i>	• <i>More difficult to assure multiple opportunities</i>

Sabotage the Environment

- Focus on setting up naturalistic situations rather than giving students instructions
- Have the student encounter situations where he needs to use those skills and then prompt for success that leads to natural reinforcement
 - another child has his favorite toy and he needs to ask for a turn
 - taking turns on the computer
 - Hide items he needs to complete a task so he has to ask where they are



Provide Multiple Opportunities to Respond

- Allows for faster acquisition to take place.
- Vary the setting and times to allow more opportunities
- Intersperse more preferred or "easier" tasks into less preferred or "harder" tasks
- Design embedded or natural opportunities to respond in addition to teacher time



Embedding Teaching Into Natural Routines

- Teaching takes place throughout the day--in "direct instruction" time, in the play area, on the playground, on walk, during snack
- Need to identify opportunities in as many activities as possible that can serve as teaching opportunities
- Can "sabotage" the environment to create opportunities
- Can teach specific lessons in specific areas (e.g., turn taking in the play area, following one/two step commands in circle).



Examples in Group Time

- Making choices of activities for the group
- Taking turns with materials and choice-making
- Facilitating peer interaction through greeting peers, passing out materials, collecting materials, passing objects to next peer
- Following directions
- Answering questions
- Receptive ID of objects
- Labeling objects
- Imitation of motor movements in a group game



Examples in the Play Area

- Structuring interactions with peers--asking questions, responding to information, asking for a turn, requesting objects or information from peers
- Turn taking
- Making choices of items to play with
- Structuring and reinforcing appropriate play skills with toys
- Increasing the variety of toys student plays with (e.g., through an activity schedule)
- Receptive and expressive labeling
- PECS and aug. comm. need to be available



Examples of Functional Academics

- Providing personal ID (either through speech or by providing an ID card)
- Telling time
- Sorting items
- Recognizing community signs
- Identifying coins--embedded into token exchange activities or field-trip activities
- Matching or naming numbers



Follow the Student's Lead

- Can't find a motivator or keep his interest...what does he want to do?
 - Build the skill into that activity
- He wants to go for a walk, identify objects for vocabulary on the walk
- He likes to look through sports magazines, have him cut out pictures of different kinds of clothes and match it to weather to identify the right clothes for the temperature



Use Favorites...for materials and reinforcers

- Make task materials out of items that have high interest for students
 - Dinosaurs for matching colors
 - Counting with trains
 - Count the blades of the fan
- Make the task related or similar to a favorite interest
 - Baseball fans can get a home run when they earn all their tokens and their tokens can be the bases
 - A Michael Jackson fan can do a MJ dance as a reinforcer
 - He likes to get sodas from the vending machine, have him earn coins toward buying a soda



Vary the Materials

- Helps generalization and engagement
- Keep the materials fresh...new materials can be new and fun
- Use the same materials in new ways
 - Have him use a flashlight to identify vocabulary pictures
 - Have him use a pointer and put the cards on the wall
- Use familiar activities to sabotage to encourage for communication (e.g., incomplete puzzle)



Choices

- Give choices of
 - Materials
 - Tasks
 - Task order
 - Partners / playmates
 - Jobs in the classroom
 - Reinforcers
 - Writing implements



Integrating Instruction in the Classroom

- Group the students with like abilities
 - Use choral responding for verbal programs
 - Use response cards for each student to respond
 - Alternate presentation of tasks 1 at a time
 - One student gets a turn, another gets a turn, first child's turn, next child's turn
 - Give a turn taking prop to help the students know when it is their turn to answer (e.g., flashlight to point to vocabulary card)



Integrating Instruction in the Classroom

- Plan a lesson around the DTT skills that will work to keep the kids engaged in a group activity
 - Make a picture book with the required vocabulary and make teacher time a story time having the students locate the items or name them in the book
 - Have the students go on a scavenger hunt if they are able to leave and return to the table independently—they can find items they are learning to identify
 - Do a version of Teacher Says as an activity and include imitation of skills as the goal (e.g., "Do this:").



Integrating Instruction in the Classroom

- If some children need more I-I time or are detracting from the progress of the group, use creative scheduling
 - Schedule time from art activity to do I-I time with children
 - Pull from group times for I-I DTT time
 - Keep the student inside from the first 10 or 15 minutes of core or playground and do DTT, then send them to join group
 - Use table tasks time as a time to pull for DTT
 - If a student can't sit in circle for as long as the other students, let him stay while he is successful and remove him before problems—remove him to do DTT time with an aide



Integrating Instruction in the Classroom

- Give a student a skill that is related but easier to practice the skill while you work with another student
 - This is different than a reinforcer or toy to play with or even a puzzle or file folder they often do
 - Create activities that will change that allow the student to practice his or her skills with some assistance



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