WORKSHOP C-4

Using Errorless Learning Strategies to Teach New Skills

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Tracks: Educators/Clinicians, Family

ABSTRACT:

Errorless learning refers to a research-based instructional strategy that limits an incorrect response in a learning situation. Errorless learning has been contrasted with trial and error learning in which the child attempts a task and is given feedback regardless of their responding (correct vs. incorrect). Research suggests that the demands of learning by trial and error (typical teaching strategies that occur across school settings) can provoke problem behavior including tantrums, aggression, and self-injury (Carr, Newsom, & Binkoff, 1980; Weeks & Gaylord-Ross, 1981). It is known that children with autism learn very differently than typically developing children and benefit from very individualize and structured instructional procedures. Errorless learning has been effective in teaching children with autism and other developmental disabilities. Errorless learning is a method that prevents children from making errors; thus, they only learn the correct response and do not have to be corrected or re-taught. Research supporting errorless teaching will be reviewed and videos demonstrating errorless teaching strategies will be shown.

OBJECTIVES:

1. Participants will be able to recognize and discuss relevant research supporting errorless teaching techniques with students with autism.

2. Participants will be able to describe the difference between traditional trial and error teaching vs. errorless learning.

3. Participants will be able to discuss and demonstrate errorless learning techniques while working with children.

Joyce West, MEd

has 20 years of teaching experience with young children with disabilities. She holds dual certificates in regular and special education. Over the years she has implemented several types of service delivery models such as home instruction, itinerant preschool services, teaching moderate to intensive classrooms, instructing classrooms with peer models, and consulting in kindergarten classrooms. Joyce received her Master's degree from Ashland University and just recently completed coursework for her BCBA through the Florida Institute of Technology. She continues to teach for a public school while working in her free time for ABA Outreach Services. In both positions Joyce bases her instruction on the foundations of Applied Behavior Analysis.

Michelle Nameth Baskin, MEd, BCBA

founded ABA Outreach Services to coordinate home programs utilizing Applied Behavior Analysis through play. Her experience includes ten years utilizing Applied Behavior Analysis in California, Oregon, and in Ohio. She received her Master's degree and Teaching Certificate in Special Education from Cleveland State University. Michelle was a special education teacher in a cross-categorical special education classroom in a public elementary school and was an adjunct professor of Special Education at Cleveland State University. She does trainings for parents and professionals with the Milestones Autism Organization. Through her company, ABA Outreach Services, she serves children with autism in home programs, social skills groups and school consultation.

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Traditional Trial & Error Learning

- Trial and error learning creates the opportunity for CORRECT and INCORRECT selection during learning trials
- Learner experiences consequences of each
- Correct responses (S+) should increase because of reinforcer delivery
- Errors (S-) should decrease due to corrective consequences presented

(Sidman et al., 1974; Mueller et al., 2000)

Side Effects of Trial & Error Learning

- Most typical children can make errors and learn from them.
- However, many children with autism have obsessive tendencies and they often become too frustrated to learn after they make mistakes.
- Frustration from being incorrect can provoke problem behavior such as tantrums, aggression, and self-injury.

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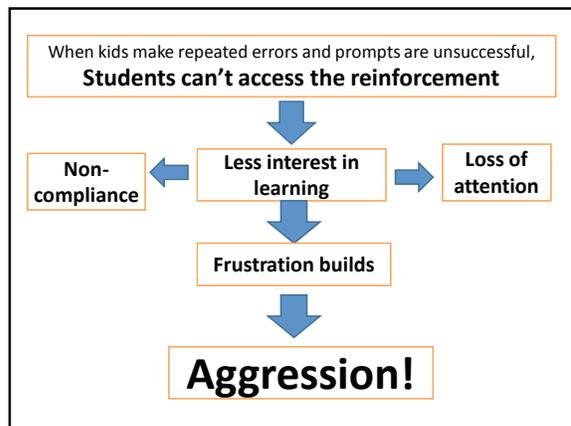
Side Effects of Trial & Error Learning

- Children with any disability including anxiety or memory issues are more likely to remember the **errors** since they are:
  - More emotionally laden
  - Self generated
  - Often repeated more than once

Side Effects of Trial & Error Learning

- Making errors can have serious and dangerous side effects
- It can lead to stimulus overselectivity (learning the incorrect answer rather than the correct answer)
- If the instructor repeatedly says "No," then "No" loses its impact
- Students with echolalia often repeat mistakes before an instructor is able to prompt

(Azrin et al., 1966; Lerman et al., 1999; Rilling & Caplan, 1973; Durcharme, 2003; Weeks & Gaylord-Ross, 1981; Lovaas et al., 1979)

When kids make repeated errors and prompts are unsuccessful, **Students can't access the reinforcement**

Non-compliance	←	Less interest in learning	→	Loss of attention

Frustration builds

Aggression!

Definition of Errorless Learning

- Introduced by Herbert Terrace (1963)
- When a skill is taught, the therapist prompts immediately after the Sd or instruction.
- There is no chance for an incorrect response
  - However, many practitioners do a version of this where they initially probe to see what the child knows and then proceed to prompt errorlessly
- Prompts are systematically removed until children are able to respond correctly on their own.

Benefits of Errorless Teaching

Success breeds success….
- Provides access to reinforcers
- Sustains focus
- Keeps momentum building
- Maintains attention
- Improves confidence
- Increases likelihood of remembering correct answer
- POSITIVE PRACTICE!

Different Errorless Learning Techniques

- Stimulus Fading
- Stimulus Shaping
- Delayed Prompting
- Response Prevention
- Superimposition with Stimulus Fading
- Superimposition with Stimulus Shaping

Prompt Hierarchy

- **Physical prompting-** Physically directing the child to do the correct response.

- **Verbal prompting-** Giving the full verbal answer, a part of the word, the beginning sound or overemphasizing the word within some choices.

Prompt Hierarchy Cont.

- **Gestural prompting-** pointing to, looking at, moving, or touching the correct response.

- **Pictorial (two-dimensional) prompts-** Picture, words, symbols, etc.

Prompt Hierarchy Cont.

- **Positional prompting-** Placing the object you want selected closer to the child.

- **Modeling-** Acting out the desired response

Fading Prompts

- Different types of responses require different fading techniques

- Sometimes it is appropriate to fade intensity of the same type of prompt

- Sometimes it is appropriate to go down the prompting hierarchy, using different types of prompts

Fading Prompts

Example 1: **Teaching a child to cut:**
1st: Physically prompt
2nd: Partial physical prompt
3rd: Intermittent partial physical prompt
4th: Cut independently

Fading Prompts

Example 2: **Teaching a child to respond to the question, "What's your name?"**

1st: Prompt with visual (name card and picture), gestural (point at him), and verbal prompt (say name)
2nd: Prompt with visual and gestural
3rd: Prompt with gestural
4th: Ask without a prompt

Stimulus Fading

- Highlighting a manual dimension of a stimulus to increase the likelihood of a correct response.

- Has been demonstrated across intensity, duration, size, shape, color, position, etc.

- Easiest errorless learning technique to use

- Can be easily applied to current teaching procedures such as DTT

  Moore & Goldiamond (1964)

Stimulus Fading Example

- Presented 2 shapes for student to receptively identify
- Gradually faded the incorrect option in by small increases in brightness
- Children did not learn to discriminate through trial and error when both were presented at same intensity
- **ALL** learned skill when responding was established **ERRORLESSLY** via stimulus fading
  Moore & Goldiamond (1964)

Stimulus Fading Example

- Taught children to identify coins
- Initially presented with 1 coin, given verbal "Touch ___ "
- After correct responding, another coin (S-) was added but at distant position
- S- coin was moved closer & closer to S+ until both were equal and randomly presented on either side
 Cipani & Madigan (1986)

Stimulus Shaping Methods

- Gradually changing the physical properties of both the S+ and S- over successive trials

- The choices at the end are physically different than their initial presentation (Lancioni & Smeets, 1986)

- Initial choices should be mastered to prevent errors and correct responding should continue as small changes shape the known stimuli to new unknown stimuli

Stimulus Shaping Example

Pegboard

- Taught children visual-motor skills: pegboard & self-care skill (hang toothbrush or washcloth on a hook)
- Gradually changed the topographical configuration of the stimuli over trials
- Increased similarity b/t target & distracter to make discrimination more difficult
- Children learned skills with less trials, fewer errors, required fewer therapist prompts, & resulted in more reinforcement than traditional teaching methods
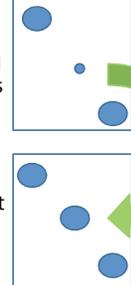
Mosk & Bucher (1984)

Sd - "Put the pegs in the corner holes"

Delayed Prompting Example

- Systematic increase in time from the presentation of choices to the onset of the prompt
- Taught children to receptively identify pictures when given a verbal demand
- Experimenter immediately pointed to the correct response upon presentation of the pictures
- ALL children began to select correct choice (S+) before the prompt was delivered
Touchette (1971)

Response Prevention

- Present correct (S+) and incorrect (S-)stimulus to student
- Tell child to select item "Point to the spoon"
- If student begins to point to incorrect choice, physically block the response and guide his hand to the correct response

Response Prevention Example

- Taught children to discriminate color choices
- Two colored shapes were illuminated and a bar lever press under correct (S+) choice was presented
- Correct responding was established before responses could be made to the incorrect choice (S-)
- Responding to S+ persisted with very few errors throughout experiment
- Errors are physically prevented/blocked until learner responds independently to the S+
Storm & Robinson (1973)

Superimposition with Fading & Shaping

- Less frequently used in errorless learning

- Involves changing in the addition of known stimuli to help the child discriminate between unknown stimuli

Superimposition with Stimulus Fading Example

- Taught children to read an analogue clock
- Hour hand covered in red & red circles were placed next to the hour numbers
- Minute hand covered in yellow & yellow circles placed next to minute numbers
- Red & green cues were faded overtime

Cipani & Madigan (1986)

Superimposition with Stimulus Shaping Example

- Taught children sight words by having picture of the object on the card

- The picture of the cat was gradually faded into part of the word "CAT"

- The picture of CAT was shaped to resemble and then replace the letter "A" until no trace of the picture remained on the card

Etzel et al. (1981)

Practice

1. Practice with Chinese symbols

- Pick a technique to fade prompts and teach Receptive Identification of 1 symbol.

   Sd: Put 3 cards out and say, "Give me family."

2. Practice teaching a new phone number

- Pick a significant other's phone number and pick a method to fade prompts.

   Sd: "What is my mom's phone number?"

Applications of Errorless Learning

- Discrimination learning is a complex but necessary task for children with PDD
   (Green, 1996; Smith, 2001)
- Incorrect responding associated with Trial & Error procedures have potential negative side effects
- Various methods reviewed should be used to eliminate or reduce responding to incorrect choice stimuli
- Use Errorless Learning Procedures during DTT, Incidental Teaching, NET, PRT

   (Mueller, Palkovic, & Maynard, 2007)

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