Functionality

Teaching skills that make sense

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"A Case For Teaching Functional Skills"

- Preston Lewis, Dec. 1987, TASH Newsletter excerpt
- Outlines a scenario of a non-functional approach to assessment and instruction.

My brother Daryl
18 years old, TMH (30-40 IQ).
Been in school 12 years.
Never been served in any setting other than elementary school.
He has had a number of years of "individual instruction".
He has learned to do a lot of things!
Daryl can do lots of things he couldn't do before!
But he can't put quarters in vending machines.
Upon command he can "touch" nose, shoulder, leg, foot, hair, ear.
He's still working on wrist, ankle, hips.
But, he can't blow his nose when needed.
He can now do a 12 piece Big Bird puzzle with 100 percent accuracy and colour an Easter Bunny and stay in the lines!
But, he prefers music, but was never taught how to use a radio or record player.

He can now fold primary paper in halves and even quarters.
But, he can't fold his clothes.
He can sort blocks by color; up to 10 different colors!
But, he can't sort clothes; whites from colors for washing.
He can roll Play Dough and make wonderful clay snakes!
But, he can't roll bread dough and cut out biscuits.
He can sing his ABC's and tell me names of all the letters of the alphabet when presented on a card in upper case with 80 percent accuracy.
But, he can't tell the mens room from the ladies room when we go to McDonald's.
He can identify with 100 percent accuracy 100 different Peabody Picture Cards by pointing!
But, he can't order a hamburger by pointing to a picture or gesturing.

He can walk a balance beam frontwards, sideways and backwards!
But, he can't walk up the steps or bleachers unassisted in the gym to go to a basketball game.
He can count to 100 by rote memory!
But, he doesn't know how many dollars to pay the waitress for a $2.59 McDonald's coupon special.
He can put the cube in the box, under the box, beside the box and behind the box.
But, he can't find the trash bin in McDonald's and empty his trash into it.
He can sit in a circle with appropriate behaviour and sing songs and play "Duck, Duck, Goose."
But, nobody else in his neighborhood his age seems to want to do that.
I guess he's just not ready yet.

Is it a functional skill?

1. If the learner can't do it, will someone else have to?
2. Is the skill age-appropriate for the learner?
3. Is the skill needed immediately?
4. Will it continue to be needed in the future?
5. Is the skill needed frequently?
6. Will the skill be needed in multiple environments?
7. Can it be maintained by naturally occurring events?
8. Will the skill enhance the learner's quality of life?

Based on Brown, et. al (1980)

What we are discussing today?

- Implications of functionality
  - For goal selection
  - For teaching strategies
  - For evaluation of progress

How are we determining skills to be worked on?

- Is it the "next item on the list?"
- Are you doing it because it is in the IEP?
- Are you following a curricular sequence?
  - What are the advantages and disadvantages to this approach?

HOW SHOULD WE BE DETERMINING GOALS?

- Individual assessment
  - Preferences
  - Skills
  - Next environments
  - Family input
  - Vision

What are other elements of functionality?

- How are we teaching?
- Where are we teaching?
- What materials are we using?
- How are we evaluating progress?

How are we teaching?

- Discrete trial instruction?
- What about other methods?
  - Shaping
  - Chaining
  - Naturally occurring opportunities
  - Incidental teaching

Why shaping?

- Shaping involves the reinforcement of successive approximations to the ultimate outcome/goal.
  - Getting from A to Z
  - Increasing quality of response
  - Working on complex skills with reduced frustration and increased access to reinforcement

How does shaping work?

- Through differential reinforcement
  - New correct levels of responding are reinforced and previously reinforced responses are placed on extinction

Definition

- Behavioral shaping is the differential reinforcement of successive approximations to a desired behavior.
- "repeatedly reinforces minor improvements or steps toward" the target behavior (Panyan, 1980)

Differential Reinforcement

- One member of a response class is reinforced, while other previously emitted members of the same response class are not (Holland & Skinner, 1961).
- One member of the response class becomes more likely to occur, while other members become less likely to occur. Response differentiation results.

Applications of shaping relevant to older learners

- Duration of response/task completion
  - Vocational tasks
- Quality of response
  - Eye contact/attending
  - Appropriate social behaviors
  - Comprehensibility to listener
- Independence of response

Advantages of Behavioral Shaping

- 1. It is a positive procedure
  - no punishment
  - reinforcement is delivered consistently
- 2. Can be used to teach new behaviors
  - focus on the end goal
  - can be combined with other teaching procedures

Disadvantages of Behavioral Shaping

- 1. It is time-consuming
- 2. Progress is not always linear and may be erratic.
- 3. It must be implemented by a knowledgeable instructor.
  - Subtle process
  - Definitions of approximations are complex

Using Shaping Effectively

- Match shaping to the appropriate behaviors
- Define the terminal behavior precisely
- Decide the criterion for success
- Analyze the response class
  - consult norms
  - videotape
  - perform the behavior

Increasing the Efficiency of Behavioral Shaping

- 1. Combine an SD with shaping
- 2. Consider using prompts

Using Shaping Effectively

- Identify the first behavior to reinforce
- Eliminate interfering or extraneous stimuli
- Proceed gradually
- Continue reinforcement when the terminal behavior is achieved
- Link the behavior to other behaviors

CHAINING

- This is perhaps the most important ABA strategy for teaching older learners
- It is relevant to all daily living and self-help skills

CHAINING

- Behavior Chains
  - a behavior chain is defined as a specific sequence of responses, each associated with a particular stimulus condition
  - each discrete response and the associated stimulus condition serve as an individual component of the chain
  - when individual components are linked together, the result is a behavior chain

Behavior Chains

- In a behavior chain, the stimulus conditions operate so that each response produces a conditioned reinforcer that simultaneously serves as a discriminative stimulus for the next response
- The stimulus linking the components together is both a conditioned reinforcer and an SD.

Things to Know

- A behavior chain involves the performance of a specific series of discrete responses
- The performance of each behavior in the sequence changes the environment so as to produce conditioned reinforcement for the preceding response as well as to serve as an SD for the next response.

Chaining

- The way in which behaviors are linked together
  - forward: beginning with the first behavior in the sequence
  - backward: beginning with the last behavior in the sequence

Developing a Task Analysis

- A task analysis is the list of steps to be taught via a chaining procedure
- Involves breaking a complex skill or series of behaviors into smaller, teachable units
- This is the content and sequence of instructions
- Should include the instructional strategy as well as the written sequence of steps

Developing a Task Analysis

- Individual behavioral characteristics influence the development of the task analysis
  - motor skills
  - language repertoire
  - physical limitations
  - sensory impairments

Methods for Determining if Task Analysis is Properly Sequenced

- 1. Observations of a variety of competent individuals performing the desired sequence of behaviors
- 2. Consultation with experts or persons skilled in performing the task
  - experience assists in efficiency of list
- 3. Actually perform the behaviors
  - clear sense of task demands
  - refinement of response topography

Behavior Chaining Procedures

- Forward chaining: the sequence of behavior in the task analysis is taught in temporal order
- Reinforcement is delivered when the criterion for performance of the first step is achieved, then for completion of steps 1&2
- Each successive step requires the cumulative practice of all previous steps in the proper order

Forward Chaining

- Can be taught via clusters of skills
  - the final response in the first cluster sets the occasion for the first response in the second cluster
  - example: mealtime behaviors
    - Pre-meal skills
    - meal skills
    - Post-meal skills

Advantages of Forward Chaining

- 1. Can be used to link smaller chains to larger ones
- 2. Teaching trainers is easy, and they persist in their efforts
- 3. Behaviors are maintained

A Variation of Forward Chaining: Total Task Presentation

- The individual receives training on each step in the task analysis during every session
  - assistance given with any step individual can not perform
  - chain is trained until individual can perform all behaviors in the sequence to the predetermined criterion
  - individual has chance to perform each skill

Why do total task?

- Spooner (1984)
  - increased number of stimulus presentations, as each link in the sequence is practiced every session
  - may enable faster mastery of the chain
  - faster mastery may offset increased time in training

Backward Chaining

- All of the behaviors in a chain are completed by the trainer, except for the final behavior in the chain
- When the final behavior is performed at criterion levels, reinforcement is delivered
- Then, when both the last and next to last behaviors are performed to criterion, reinforcement is delivered

Backward Chaining

- This process continues until all behaviors (steps in the task analysis) have been introduced in reverse order and practiced cumulatively.

The Rationale for Backward Chaining

- The first behavior the individual performs independently produces immediate reinforcement
- Advantage: the learner contacts the contingencies of reinforcement immediately, and the functional relationship starts to develop

Advantages of Backward Chaining

- End product is evident, increasing perception of the function of learning the skill
- Task completion in and of itself can be reinforcing

Disadvantage of Backward Chaining

- The passive participation of the learner in the earlier responses in the chain can limit the total number of responses made in any training session

A variation of Backward Chaining: Leaps Ahead

- Not every step in the task analysis is trained
  - some steps are probed
  - may go from step 7 to step 4
    - must get 5 &6 correct, however
  - Speeds up the learning of the chain

Forward or backward??

- Little research to guide us
- Unanswered questions
  - is one associated with faster acquisition?
  - Is one prone to fewer errors?

Forward or backward??

- Perhaps we can conduct assessments for individual learners?
- Data based studies may shed light on this
  - impediments to studying this?

Behavior Chains with a Limited Hold

- A sequence of behaviors that must be performed correctly and within a specified time period if reinforcement is to be presented.
- Targets both accuracy and proficiency
  - fluency??

Factors that Affect Performance of a Chain

- 1. Completeness of a task analysis
- 2. Length or complexity of chain
- 3. Schedule of reinforcement
- 4. Extinction
- 5. Stimulus Variation
- 6. Response Variation
- 7. Staffing or Supervision Patterns

Implications of Stimulus Variation

- The behavior analyst should introduce many possible variations of the stimulus that might be encountered later
- Presentation of stimulus variations increases the likelihood that the response will occur in their presence

Implications of Response Variations

- When stimulus variation is introduced, response variation must occur to produce the same effect
- When stimulus variation is introduced, training or re-training of responses may be required

Where are we teaching?

- In the classroom?
- Where are we teaching the skill?
  - In the CONTEXT in which we wish to see it demonstrated
    - Laundry folding
    - Purchasing
    - Ordering food
    - Safety skills

What materials are we using?

- The items that will be encountered in the natural environment?
  - Fake materials vs. real materials
    - Fake vs. real money
    - Poker chips for counting
    - Play food vs. real food

How are we evaluating progress?

- Acquisition criterion only?
- What about maintenance?
- What about generalization?
- What about in the absence of adult supervision?
- What about with natural contingencies of reinforcement?

How are we collecting data?

- Level of independence
  - Number of prompts
  - Types of prompts
- Duration of activities
  - Normative duration