Using Behavior Analysis to Teach Appropriate Behavior

DAVID E. KUHN, PH.D., BCBA-D

What is ABA?
Do I use ABA?
Should I use ABA?

Applied Behavior Analysis (ABA)

- “A science devoted to the understanding and improvement of human behavior.” (Cooper et al., 2007)

- Requires:
  - Objective measurement of behavior
  - Analysis of functional relations
ABA: What it is not...

“Behavior Modification”
A Teaching Methodology
A Technology
A Theory

ABA-Based Teaching Methodologies

- Lovaas Therapy
- Discrete Trial Instruction
- Fluency-Based Instruction
- Incidental Teaching
- Natural Learning Paradigm
- Pivotal Response Training
- Natural Environment Training
- Early Start Denver Model
- Verbal Behavior

“Analysis of Functional Relations”

- Examine the relation between the target behavior and environmental events

- Stimulus – Response – Consequence
  - The *antecedents* – a stimulus/event that precedes a behavior in time
  - The *behavior*
  - The *consequences* – a stimulus/event that follows a behavior in time
Operant Conditioning

- Changes in behavior stemming from changes in the relation between an antecedent, a response, and a consequence
  - Behavior that contacts favorable consequences is strengthened
  - Behavior that contacts unfavorable consequences is weakened

Operant Conditioning

- Strengthening Behavior:
  - Example 1
    Antecedent – Teacher asks student to respond to a question
    Behavior – Student answers the question correctly
    Consequence – The teacher provides praise and delivers reinforcer
    Effect – If the child likes the praise/reinforcer he will try and answer correctly in the future
  - Example 2
    Antecedent – The teacher is diverting her attention to student “B”
    Behavior – Student “A” slaps himself in the face
    Consequence – The teacher turns back to student “A” and tells him to stop
    Effect – If student “A” wants to get the teachers attention in the future, he is likely to slap himself in the face.

Operant Conditioning

- Weakening Behavior:
  - Example 1
    Antecedent – Teacher asks student to respond to a question
    Behavior – Student attempts to answer the question
    Consequence – Other students laugh at the incorrect answer
    Effect – In the future the student may be less likely to attempt to answer a question to avoid getting laughed at by others
  - Example 2
    Antecedent – The teacher is diverting her attention to student “B”
    Behavior – Student “A” hands the teacher a communication card that reads, “Excuse me”
    Consequence – The teacher ignores student “A”s request for attention
    Effect – Student “A” will be less likely to appropriately request attention in the future
Principles of Operant Behavior

- **Reinforcement**: A consequence that follows behavior increasing the future likelihood of the behavior occurring.
- **Extinction**: A behavior that has previously been reinforced no longer results in the reinforcing consequences; results in the behavior ceasing to occur in the future.
- **Punishment**: A consequence that follows behavior making the behavior less likely to occur again in the future.

Classes of Operant Behavior

- We learn about these relations & consequences in 2 different ways:
  1. Experience them → "Contingency shaped"
  2. Hear about them → "Rule-governed"

Operant Behavior: “Contingency-Shaped Behavior”

- Behavior is controlled by antecedents and consequences that are directly contacted or experienced by the individual.
- **Ex 1**: instruction → aggression → “sit in corner”
  - child will hit to avoid working
  - child won’t hit to avoid timeout
- **Ex 2**: presented new food → eat food → like/don’t like
  - Food you like may be eaten again in the future
  - Food you don’t like will not be eaten again
Operant Behavior: “Rule-Governed Behavior”

- Contingencies are described as “Rules” (e.g., “If you do XXX, then YYY will happen)
- Behavior is controlled by rules rather than by directly contacting contingencies
  - Ex 1: If you jump out of your window, you will get hurt
  - child does not jump from window
  - Ex 2: Brush your teeth or they will fall out
  - people brush their teeth
- Much of complex human behavior is “rule-governed”

Classes of Operant Behavior

- When put to the test, contingency-shaped behavior is “stronger” than rule-governed behavior.
  - Rules may not always be in effect
  - Easier to change a rule than a consequence
  - Exposure/Flooding interventions
  - Rule-governed behavior can be easier to treat – in some cases
- Most problem behavior has been shaped by the consequences that have followed.
  - The consequences are likely to be desirable

Classes of Operant Behavior

- Can we use these operant principles to teach new and appropriate behavior?
- What should the goal of teaching be?
- What are the types of behaviors we can teach?
What Should be the Goals of Teaching?

- Goals:
  1. Increase functional independence
  2. Improve quality of life

What Types of Skills Can Be Taught?

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<th>Communication</th>
<th>Socialization</th>
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<td>Brushing teeth</td>
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Performance Deficits vs. Skills Deficits

- When teaching a skill and confronted with “noncompliance”, it is important to determine whether it is because the student can’t or won’t engage in the desired behavior.
Performance Deficits vs. Skills Deficits

- Performance ("motivational") deficit
  - the behavior is part of the individual’s repertoire, but the behavior is not displayed when appropriate or displayed inconsistently.

- Skills deficit
  - the behavior is not part of the individual’s repertoire;
  - the individual does not display the behavior when appropriate because he/she does not know how

How to tell the difference:
- Does the behavior (or a similar behavior) occur at all?
  - if yes, a performance deficit
  - if no, a skill deficit...maybe
- Does the behavior increase when you provide reinforcement contingent upon its occurrence?
  - if yes, a performance deficit
  - if no, a skill deficit...maybe
- Does the behavior occur when you support it with prompts?
  - if yes, skill deficit
  - if no, a performance deficit...maybe

Addressing a Performance Deficit
- develop ways to increase motivation (identify and deliver powerful reinforcers)
Identifying reinforcers to use during teaching:

- Questionnaires: client, parents, and/or teachers
- Preference Assessments: Present potential reinforcers and measure approach behaviors
- Reinforcer Assessments: Present potential reinforcers following the desired response and measure response rate or duration – does it increase?

Performance Deficits vs. Skills Deficits

- Addressing a Skill Deficit:
  - develop ways to teach the individual to complete the behavior in response to prompts etc.
  - Prompting procedures
  - Task analyses and behavioral chaining
Skill Deficits: Shaping New Responses

- What can you do if you want to teach a behavior that a child does not currently exhibit?

- Shaping → Reinforce successive approximations of a target behavior until the person exhibits the target behavior

- In other words:
  Reinforce attempts at behavior (e.g., reinforce “d-” when teaching “dog”).
  Alter requirement to get reinforcer

Examples:
1. Teach a child to say “mommy”
   - Instructor may initially provide reinforcement if the child says “mmm.”
   - As the child learns to expand upon this, such as saying “ma,” then the initial “mmm” is no longer reinforced but the sound of “ma” is reinforced, etc.
2. Teach a child to gain eye contact
   - Instructor may initially provide reinforcement if the child remains in front of instructor
   - Reinforcement if torso is oriented towards instructor
   - Reinforcement if head and torso are oriented towards instructor
   - Reinforcement if head and torso are oriented towards instructor and the child’s eyes are directed toward instructor’s head
   - Etc.

Skill Deficits: Prompting

- What can you do if you want to teach a behavior that a child does not currently exhibit?

  - Prompting → A prompt is something used to increase the likelihood that a person will engage in the correct behavior at the correct time
  - Prompts are given before or during the occurrence of a behavior to help the behavior occur
  - The use of prompts makes teaching or training more effective because it increased the likelihood that a behavior will occur...and then be reinforced
Methods used to quickly establish new behaviors and ensure that those behaviors make contact with reinforcement

- Most to least prompting
  - Physical guidance → Partial physical → Shadow → Verbal

- Least to most prompting
  - Verbal prompts → Gestural Prompts (modeling) → Physical prompts and graduated guidance

When to use one prompting method over another

- Most to least prompting
  - New behavior that requires novel movements/behavior
    - Ex: Buttoning a button

- Least to most prompting
  - New behavior that requires a response “similar” to other behavior(s) in his/her repertoire.
  - When teaching a response that cannot be physically guided (e.g., vocal response)

Example: Least-to-Most Prompting

- Target Behavior: Raising arms
  - Verbal prompt: “Raise arms?”
    - The child raises arms → reinforcer
    - Child does not raise arms → go to Model Prompt
  - Model prompt: “Raise Arms” as you raise your own arms.
    - The child imitates, and raises arms → reinforcer
    - Child does not raise arms → go to Physical Prompt
  - Physical prompt: “Raise Arms” while physically raising his/her arms.
    - You may or may not deliver the reinforcer
### Example: Most-to-Least Prompting

**Target Behavior:** Raising arms

- **Physical prompt:** "Raise Arms" while physically raising his/her arms.
  - Deliver the reinforcer following response completion
- **Partial physical prompt:** "Raise arms" while gently pushing at base of child’s elbows in an upward direction
  - The child raises arms → reinforcer
  - Child does not raise arms → go back to Physical Prompt
- **Verbal prompt:** "Raise Arms?"
  - The child raises arms → reinforcer
  - Child does not raise arms → go to Partial Physical Prompt

### Prompting & Fading

- **What is fading?**
  - Gradual removal of prompts as the behavior continues to occur
- **Ways to fade prompting:**
  - Prompt delay
  - Stimulus fading

### Chaining & Task Analyses

- **Chain**
  - Multi-step actions where all steps have to occur in right sequence to get it right
- **Examples of Chains**
  - tying shoes, washing hands, brushing teeth, making a sandwich, getting a glass of water
- **Within a chain:**
  - Each completed step serves as a cue for the next relevant action (e.g., turning on the water serves as a cue for getting hands wet)
  - If the chain is interrupted you may lose some steps in the sequence
  - Chain completion = task completion, which may serve as own reinforcer
Chaining & Task Analyses

- Before a chain is taught you have to identify every step using a task analysis.

- Task Analysis: List of all behaviors, natural cues, and instructions in the chain
  - Observe someone perform the task well
  - Consult an expert
  - Perform the task yourself

Chaining & Task Analyses

- 3 Chaining Methods
  1. Backward Chaining
  2. Forward Chaining
  3. Total Task Presentation – will not discuss

Backward Chaining

Backward Chaining
- All steps are completed for the child, except for the last, then second to last, etc.
  - Steps 1-2-3-4-5 (therapist) Step 6 (child) → reinforcer
  - Steps 1-2-3-4 (therapist) Steps 5-6 (child) → reinforcer
  - Steps 1-2-3 (therapist) 4 Steps -5-6 (child) → reinforcer

- This works best when there is a natural reinforcer at the end of the chain.
Backward Chaining

Example: Putting on a coat
1. “Put on your coat” → Sam zips up his coat from ½ way → “Good job!” → Go play outside
2. “Put on your coat” → Sam hooks the zipper → He zips up his coat “Good job!” → Go play outside
3. “Put on your coat” → Sam puts arms through sleeves → He hooks the zipper → He zips up his coat → “Good job!” → Go play outside

Backward Chaining

Advantages:
1. Minimizes endurance and motivation problems associated with long chains
2. Completing the chain may often produce a natural reinforcer (ex., going outside).
3. Child gets to contact the reinforcer quickly

Forward Chaining

- Teach the steps in a forward manner, 1 at a time
  - Step 1 → reinforcer
  - Steps 1-2 → reinforcer
  - Steps 1-3 → reinforcer
  - etc
- Instructor can either complete remaining steps or delay until training
- Use when the client can perform each of the steps
- Use when the initial steps are easiest
- Need to identify alternative reinforcer to deliver after completing steps
### Forward Chaining

**Example: Stuffing an envelope**

1. “Fold the paper” → Sarah folds the paper → “Good job!” + reinforcer

2. “Stuff the envelope” → Sarah folds the paper and places into an envelope → “Good job!” + reinforcer

3. “Stuff the envelope” → Sarah folds the paper, places into an envelope and seals envelope → “Good job!” + reinforcer

### In Summary

- ABA helps us understand how we learn new behaviors.
- ABA procedures can be applied to teach a lot of new appropriate behavior.
- Before we teach, we need to know if the lack of performance is a skill or motivation deficit.
- Reinforcers may need to be identified.
- Choose the teaching procedure that is most appropriate to the skill:
  - Shaping
  - Prompting
  - Chaining

### Thank you!

Questions??