Introduction to Applied Behavior Analysis

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some material adapted from presentations created by Ed Lentz, PhD and the Cincinnati Center for Autism
Introduction to ABA

- Objectives
  - History of Behaviorism
  - What is ABA?
  - Dimensions of Applied Behavior Analysis
  - Functions of Behavior
  - Four Term Contingency
  - Reinforcement and Punishment
  - Matching Law
  - Competing Behavior Model
  - Measurement
History of Behaviorism

- **Ivan Pavlov [1849-1936]**
  - “While you are experimenting, do not remain content with the surface of things.”

- Ivan Pavlov's discovery and research on reflexes influenced the growing behaviorist movement, and his work was often cited in John Watson’s writings.

- Classical conditioning/ Respondent conditioning
History of Behaviorism

- **John Watson** [1878-1958]
- “Father of Behaviorism”
- “Watson argued that the proper subject matter for psychology was not states of mind or mental processes but observable behavior.” [Cooper, Heron & Heward, p.9]
- **Stimulus- Response Behaviorism**
History of Behaviorism

- **B.F. Skinner** [1904-1990]
  - “The consequences of an act affect the probability of it's occurring again.”
- Founder of experimental analysis of behavior
- Skinner developed the theory of “operant conditioning,” the idea that we behave the way we do because this kind of behavior has had certain consequences in the past.
- Skinner and others outlined basic principles of behavior, which include reinforcement, prompting, fading, shaping, schedules of reinforcement, etc., etc., etc.
- In addition to fleshing out operant conditioning, Skinner also analyzed the functions of language and presented his analysis in the 1957 book *Verbal Behavior*. 
History of Behaviorism

- **B.F. Skinner** [1904-1990] *(Continued)*
  - “Father of Radical Behaviorism”
- Philosophy of the science of behavior (usually referred to as behavior analysis)
  - Holds that a science of behavior, completely natural, is possible and desirable
- Mentalistic explanations of behavior are not useful and often obscure the real reasons for behaving
  - We often talk in mentalistic ways (“slipped my mind”)
- Private events are natural behaviors (thinking, feeling, dreaming, etc.); they are *psychological activities*
- Activities are extended across time and involve past and present, and different types of behaviors
Mental explanation examples

- “He only does what he wants to”
- “I just felt like it”
- “His behavior problems occur because he is so angry”
- “He is so unmotivated about school work”

None of these are useful, and all ignore previous relationships, learning, current conditions, etc.

They do not fit into scientific ideas about behavior.
History of Behaviorism

- **Ivar Lovaas [1927-2010]**
  - “Father of ABA for autism”
  - Lovaas Technique
  - Landmark study published in 1987…
  - *Teaching Individuals With Developmental Delays: Basic Intervention Techniques*, 2000
What is Applied Behavior Analysis?

- Scientific approach to the study of socially significant behavior.
  - **Applied**: Applied interventions deal with problems of demonstrated social importance.
  - **Behavioral**: Applied interventions deal with measurable behavior (or reports if they can be validated).
  - **Analytic**: Applied interventions require an objective demonstration that the procedures caused the effect.
What is ABA?

**APPLIED? BEHAVIORAL? ANALYTIC?**

- ABA seeks to be effective (make meaningful changes)
- Important to analyze relationships between behavior and environment so we can plan interventions (analytic), or to experimentally evaluate the effect of interventions on target behaviors (analytic)
- Must focus on changing behavior that will improve lives of participants (applied)
  - Ethical principle
  - Behavior in the problem (natural) setting
- Must focus on the actual behavior to change (behavioral)
  - Must be objective/measurable
  - Must make sure behavior of client is changing not behavior of observer
What is ABA?

Behaviorism and conceptual behavior analysis

- Experimental analysis of behavior
  - Basic research to understand behavior
  - Why is animal research valued?

- Applied behavior analysis
  - Research into practice

- Behavioral practice
  - Systematically applying laws of behavior to make important differences
What is ABA?

- BIGGEST MISCONCEPTION:
  - ABA is something you ‘do’.

NO!!

ABA is the scientific approach to studying human behavior. When we implement ABA based strategies, we are applying our understanding of the principles of behavior to our advantage to decrease undesirable behavior and increase functional behavior.
What is ABA?

- The only approach with research to support its effectiveness in treating individuals with ASD.

  **Recommended by:**
  - Centers for Disease Control and Prevention (CDC)
  - American Pediatric Association (APA)
  - National Institute of Mental Health (NIMH)
  - U.S. Surgeon General
  - Autism Society of America

**Ongoing Research**

- Interventions based on the principles of ABA have been established as effective by replicated & peer-reviewed research
  - National Standards Project (National Autism Center)
What is ABA?

- Programs/methodologies based on ABA include:
  - Structured Teaching (TEACCH)
  - Picture Exchange Communication Systems (PECS)
  - Pivotal Response Training (PRT)
  - Discrete Trial Training (DTT)
  - Incidental Teaching
  - Positive Behavior Supports
  - Verbal Behavior Analysis (VBA)

* The formal programs listed above don’t necessarily identify themselves as programs utilizing the principles of ABA. They are however, shaping behavior by structuring the environment to elicit specific responses and using reinforcing consequences to teach new skills.
Dimensions of Applied Behavior Analysis

- Baer, Wolf, and Risley (1968) recommended the following seven defining dimensions for research or behavior change programs:
  - Applied
  - Behavioral
  - Analytic
  - Technological
  - Conceptually Systematic
  - Effective
  - Generality
Dimensions of Applied Behavior Analysis

- Methods to identify and define targets for behavior change, set goals (*behavioral and applied*)
- Identify relevant factors that may influence intervention planning (*analytic*)
- Monitor progress and make decisions about changes (*analytic, behavioral, technological*)
- Evaluate outcomes (*effective*) for accountability
- Determine if intervention is being implemented (*technological*)
- Determine if data being collected are accurate (and reflects the behavior of the target, not the observer) (*behavioral*)
- Determine if outcomes are socially important (*effective, generality*)
What is “Behavior”?

“The activity of living organisms; human behavior includes everything that people do (Cooper, Heron, Heward, 2007).”

Dead Person’s Test: If a dead person can do it, it is not a behavior!

Examples: Receives a token, sits in chair, does not get out of seat, wears shoes, behaves appropriately, does not swear at peers, etc.
It's all fun and games until someone figures out the function of your behavior.
Functions of Behavior

All behavior is strengthened (reinforced) by either “getting something” or “getting out of something.” (Cooper, Heron, Heward, 2007)
Functions of Behavior

There are **FOUR** functions of behavior:

- **Getting Something:**
  1. Attention
  2. Access to Tangibles
  3. Alone/Automatic (Self-stimulatory behavior)

- **Getting Out of Something**
  4. Escape
ATTENTION:

- Behavior that results in attention from others
  - Attention can include: head turns, surprised facial expressions, eye contact, reprimands, attempts to soothe, counsel or distract, etc.

- Examples of attention maintained behavior:
  - Less desirable: banging head, pinching, silly behavior, picking nose, wrong answers, vomiting, aggression.
ESCAPE:

- **Avoidance**
  - Behavior that results in the avoidance of an aversive activity/task.

- **Escape**
  - Behavior results in the termination of an aversive activity/task.
    - Avoiding or escaping task
    - Avoiding or escaping social demand

- **Examples of escape-maintained behavior:**
  - Appropriate: “I need a break.”, “I would like to go.”, signing “all done.”, exchanging picture representing “break”.
  - Less Desirable: aggression, SIB, silliness, scratching, screaming, tantrums, throwing objects, non-responsiveness.
ACCESS TO TANGIBLES:

- Behavior that results in obtaining access to objects, items, materials, foods.

- Examples of behavior maintained by access to tangibles:
  - Appropriate: Asking for item, signing for item, exchanging picture for item, reaching for item.
  - Less desirable: crying, tantrums, aggression, SIB
AUTOMATIC

- Behavior that does not rely on the action of others to produce a reinforcing outcome.
  - A.K.A. Self-stimulatory behavior.

Examples of behavior maintained by automatic reinforcement:
- Socially acceptable: shaking leg, thumb sucking, playing with hair, rocking in rocking chair, chewing gum, tapping pencil.
- Less accepted: hand flapping, scripting, twirling/spinning objects, looking at items out of corner of eye, self-injurious behavior (SIB), rocking, grinding teeth.
Topography vs. Function

- Purpose (what individual is gaining or getting out of by engaging in behavior) VERSUS
- What the behavior LOOKS like…
- When determining how best to respond to a challenging behavior, topography is not as important as function. WE MUST ADDRESS THE FUNCTION OF THE BEHAVIOR!
Four Term Contingency

- “Three” Term Contingency
  - “ABC’s of Behavior”
    - Antecedent, Behavior, Consequence

- “Four” Term Contingency
  - “ABC’s of Behavior” plus environment
    - Setting event, Antecedent, Behavior, Consequence

Motivating Operation (MO) → Discriminative Stimulus (SD) → Behavior → Consequence
Reinforcement

- **Positive reinforcement** occurs when a behavior is followed immediately by the presentation of a stimulus that *increases* the future frequency of the behavior.

  - Example: Providing a child with specific verbal praise after they put away a toy to increase the likelihood that they will clean up their toys in the future.
## Positive Reinforcement: Examples

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Behavior</th>
<th>Consequence</th>
<th>Future Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child wants attention. No one in environment is paying attention to him.</td>
<td>Hits self in head with fist.</td>
<td>Everyone in environment turns and looks at child. Mom says, “No… don’t do that, baby.”</td>
<td>Child is more likely to hit head to gain attention in future.</td>
</tr>
<tr>
<td>Teacher tells student to complete worksheet.</td>
<td>Students complete worksheet.</td>
<td>Student earns access to computer.</td>
<td>Student is more likely to complete worksheet in future.</td>
</tr>
</tbody>
</table>
Reinforcement

- **Negative reinforcement** occurs when a behavior is followed immediately by the removal of a stimulus that *increases* the future frequency of the behavior.

- Example: Removing an item from a child’s view to increase the likelihood that they will mand for it.
## Negative Reinforcement: Examples

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Behavior</th>
<th>Consequence</th>
<th>Future Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child tantrums in check-out because he wants candy.</td>
<td>Mom gives child candy.</td>
<td>Tantrum stops</td>
<td>Mom gives candy to child when he tantrums.</td>
</tr>
<tr>
<td>Teacher says hi to student</td>
<td>Student ignores teacher</td>
<td>Teacher stops trying to interact with student</td>
<td>Student ignores to avoid social interaction.</td>
</tr>
<tr>
<td>Worksheet presented to student</td>
<td>Student hits teacher multiple times</td>
<td>Student is taken for a walk to “calm down”.</td>
<td>Student is more likely to hit teacher to escape work demands.</td>
</tr>
<tr>
<td>Worksheet is presented to student</td>
<td>Student says, “I need a break.”</td>
<td>Students is allowed to leave desk and go for a walk.</td>
<td>Student is more likely to request a break to escape work demand.</td>
</tr>
</tbody>
</table>
Punishment

- **Positive punishment** occurs when a behavior is followed immediately by the presentation of a stimulus that decreases the future frequency of the behavior.

  Example: Requiring a student to go back and walk down the hallway again after they have exhibited an undesirable behavior in the hallway (e.g., running, banging, yelling, opening doors).
Punishment

- **Negative punishment** occurs when a behavior is followed immediately by the removal of a stimulus that decreases the future frequency of similar behaviors.

  - Example: Removing an item that a student has taken from another student to decrease the likelihood that they take items from other students in the future.
To Clarify…

- **REINFORCEMENT** = *Increasing* the likelihood of the behavior
- **PUNISHMENT** = *Decreasing* the likelihood of the behavior
  - Not always bad
- **Positive** = *Adding* a stimulus
- **Negative** = *Removing* a stimulus
  - Not actually “negative”
Schedules of Reinforcement

- Different behaviors are being reinforced at different times and in different ways

- A “schedule of reinforcement is a rule that described a contingency of reinforcement, those environmental arrangements that determine conditions by which behaviors will produce reinforcement.”
  - Cooper, Heron, & Heward, 2007
Types of Reinforcement Schedules:

- **Continuous:**
  - Reinforcement is provided for each occurrence of a behavior

- **Intermittent:**
  - Reinforcement is provided for some, but not all occurrences of a behavior
    - Intermittent schedules are used to maintain established behaviors
Intermittent Schedules of Reinforcement

- **Ratio and Interval Schedules**
  - *Ratio schedules* of reinforcement require that a behavior is observed a certain number of times before it is reinforced.
  - *Interval schedules* of reinforcement require that a certain period of time has lapsed before a behavior is reinforced.

- **Fixed and Variable Schedules**
  - In *fixed schedules* of reinforcement, the response ratio or time required before a behavior is reinforced is constant.
  - In *variable schedules* of reinforcement, the response ratio or time required before a behavior is reinforced can change.

Matching Law

“The rates of responding across choices are distributed in proportions that match the rates of reinforcement received from each choice alternative”

In other words…. Different behaviors are being reinforced at different times in different ways. We are more likely to engage in behaviors that reinforced the most!

More to come!
Competing Behavior Model

- Excellent framework to conceptualize functional hypotheses and provides framework for functional hypothesis (outcome of FBA)

- Four ‘columns’
  - Motivating operations that are discriminated by assessment
  - Problem situation and ‘triggering’ discriminative stimuli
  - Behavior: expected, problem, alternative possibilities
  - Consequences for each of these
## Competing Behavior Model

<table>
<thead>
<tr>
<th>Motivating operation (happens some time before problem, changes how likely problem is):</th>
<th>Situation(s) in which problems occur;</th>
<th>Expected (desired) behavior:</th>
<th>Consequences if happens:</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘trigger’ in situation):</td>
<td>Problem behavior</td>
<td>Consequences of problem:</td>
<td></td>
</tr>
<tr>
<td>Alternative behavior</td>
<td>Consequences if alternative occurred:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

More to come!
Measurement

...and she didn't even have any data to back it up.

your e-cards
someecards.com
Measurement

- There are a few steps that must be completed before behavior can be measured:
  - Appropriate target behaviors must be selected
  - Target behaviors must be defined
  - Well written target behavior definitions must be created
  - Target behavior definitions must be tested
  - Goals for behavior change must be set
Selecting Appropriate Target Behaviors

- Threat to health or safety; disruption
  - danger to self or others
- Potential use (frequency)
  - Opportunities to use new behavior
  - Occurrence of problem
- Longevity of problem behavior (critical in schools)
- Potential for higher rates of reinforcement
- Importance for:
  - Future skill development
  - Independence
Selecting Appropriate Target Behaviors

- Reinforcement for significant others
  - Social validity
  - Exercise caution when considering

- Likelihood of success
  - Research
  - Practitioner’s experience
  - Environmental variables
  - Available resources

- Cost-benefit
  - Costs include client’s time and effort
  - Important to think about at systemic and individual case level
Defining Target Behaviors

- Role and Importance of Definitions
  - Definitions required for replication
  - Replication required to determine usefulness of data in other situations and to make ongoing decisions within an intervention
  - Necessary for research

- Most common reason for non significant outcomes is inability to define target behavior
Defining Target Behaviors

- Important for making meaningful changes
  - Accurate, on-going evaluation requires explicit definition of behavior
  - Operational (for measurement) definition
    - Complete information
  - Accurate and believable evaluation of effectiveness
Two Types of Definitions

- **Function-based**
  - Designated according to effect on the environment

- **Topography-based**
  - Identifies the shape or form of the behavior
Writing Target Behavior Definitions

Purpose of Good Definitions:

- Precise and concise description
- Reliable observation
- Accurate recording
- Agreement and replication
Writing Target Behavior Definitions

Well written target behavior definitions are:

- Accurate
- Complete
- Concise
- Inclusions
- Exclusions
- Objective
  - Refer only to the observable
- Clear
  - Readable and unambiguous
- Complete
  - Delineate boundaries of definition
Testing Target Behavior Definitions

- Before a definition is complete, it should be tested
  - Can you count number of occurrences?
  - Can you tell whether behavior is happening or not?
  - Will a stranger know what to look for based on definition alone?
Collecting data is fun (for some of us), but it is meaningless for clients if we are not working toward an end goal

- Selecting goals is critical for social validity
- Selected because of importance to clients
  - Increase, maintain, generalize desirable behaviors
  - Decrease undesirable behaviors

Setting goals is as important as defining target behaviors:

- Range of acceptability
  - Must identify optimum behavior range prior to modifying behaviors
- Must know when to terminate treatment
- Eliminate disagreements on effectiveness
Goal setting and Socially Validity

- Valued and meaningful behaviors have high social validity
- Educational institutions may have standard valued behaviors (attendance, learning standards, discipline codes, positive behavior support)
Measurable Dimensions of Behavior

- Dimensions of behavior are distinct features that can be measured

- Three fundamental properties
  - Repeatability or countability: behavior can be counted
  - Temporal extent: duration
  - Temporal locus: when behavior occurs
Measures Based on Repeatability

- Count
  - Number of responses emitted during an observation period
  - Reported as frequency count
  - Measures of count alone do not provide sufficient information for analysis
Measures Based on Repeatability

- **Rate/Frequency**
  - Ratio of count per observation period
  - More meaningful than count alone
  - Include counting time for reference
  - Rate of correct and incorrect responses helpful in skill development
  - Reported as number per standard unit of time
Measures Based on Repeatability

- Celeration
  - How rates of response change over time
Measures Based on Temporal Extent

- **Duration**
  - Total per session
  - Total per occurrence
  - Can combine count and duration
Measures Based on Temporal Locus

- Latency
- Inter-response time
Measureable Dimensions of Behavior

- **Derivative Measures**
  - Percentage
  - Trials to criterion
Direct Observation

- Interval Time Sampling
  - Partial
  - Whole
  - Momentary

- Used to collect data during FBAs
Introduction to Functional Behavior Assessments (FBA)
Objectives

- Further explanation of the conceptual basis of ABA and problem solving
- Introduction to the foundations of Functional Behavior Assessment (FBA)
- Outline basics of FBA implementation
- Review application of FBAs in the school setting.
Conceptual basis of ABA and solving behavior problems

- Only after understanding the *function* of inappropriate behaviors can we decide what to *change* in order to improve things.
- The general process of understanding why behaviors occur is called *functional behavior assessment (FBA)*.
FBA as problem solving process

- All forms of FBA are **problem solving** processes
  - Problem identification, problem analysis, hypothesis formation and goal setting, intervention planning, intervention implementation, program monitoring and change
- Not only must presenting problems be clarified and target behaviors selected, but the ecological problem context must be understood prior to intervention selection and planning
- Expected behaviors, client skills related to expectations, people in setting, wishes of significant others and client
Foundations of FBA

- Behavior is **predictable**
  - Once related variables are understood, the occurrence of behavior can be predicted

- Behavior is **functional**
  - Nearly all behaviors are learned and maintained by factors in settings where people spend time

- Behavior is **changeable**
  - Changing functional factors in problem settings means we can change behaviors; change agents can include the ‘self’
What influences a person’s ‘choice’ of behavior? (acceptable vs. unacceptable)

REVIEW:

- The Matching Law
  - What behaviors are you most likely to engage in?
- The **Generalized Matching** Law
  - Rate of reinforcement
  - Magnitude of reinforcement
  - Timing of reinforcement
  - Response effort

Consider in problem situation: problem, expected, alternative behaviors and associated schedules
Implications for FBA

- When assessing behavior problems, the factors contained with the General Matching Law must be considered before forming hypotheses.
- When designing interventions, the idea is to change things to make acceptable behaviors far more likely than unacceptable behaviors.
- We almost never measure consequences for expected behaviors.
Functions of behavior

- Behavior that ‘exists’ is maintained by reinforcement. Positive reinforcement takes several forms
  - Stimulation resulting from behavior or sensation created by other events in the environment (sound, light, movement, etc.)
    - Created by child (vocalization, movement, friction, etc.)
    - Manipulation of objects producing above
  - Social consequences
    - Intent of interactor is irrelevant
    - Physical or not
  - Obtain tangible objects
    - Food
    - Object to play with, etc.
  - Obtain desired activities
    - Preferred activity
Functions continued

- Some behaviors are maintained by negative reinforcement
  - *Escape/avoid stimulation*
    - Noise, light, other environmental events
    - Pain (internal)
    - Itching, etc.
    - hunger
  - *Escape/avoid social interaction*
    - Intent of interactors is irrelevant
  - *Escape/avoid tasks activities*
    - Learning history issue
    - Effort or difficulty
    - Length of activity
    - Effort to reinforcement issue
Function of behaviors across settings

- The same behavior may serve different functions in different settings
- Different behaviors may serve the same function within the same setting
- Implications for effective Behavior Support Plan
Why are some tasks aversive?

- **High demand** (physical effort; difficulty or requiring frequent responding)
- ‘Aversiveness’ increases as **duration** continues
- **Low reinforcement** (compared to other available behavior)
- **Association** with person or students involved in task
- **History of escape** to desirable activities
Implications for FBA

- When assessing behavior problems, the actual manner the factors contained with the General Matching Law exist in the problem setting must be understood through assessment.
- When designing interventions, the idea is to change things to make acceptable behaviors far more likely than unacceptable.
- Consequences are often manipulated to do this.
Goals of a FBA

- All FBA procedures have the same goal: **predicting** and **understanding** misbehavior by constructing functional **hypotheses** about why they occur and allowing integrated **intervention** planning.

- All people are unique, but the principles of behavior related to that uniqueness are the same.

- Differences in FBA approaches lie in **intensity** of assessment:
  - Simple (or indirect) FBA
  - Full (“direct descriptive”) FBA
  - Functional Analysis
Indirect FBA

- Primarily involves **indirect assessment** methods
- Review of **records**
- Structured **behavioral** interview(s)
  - Identify presenting problems (frequencies)
  - Identify problem situations
  - Identify antecedents and consequences in problem and non-problem situations
  - Explore behavioral deficits
- Structured FBA interviews such as the **FAST** or **FACTS**
- Product: **functional hypotheses** on why behaviors (undesirable and desirable) occur or do not occur
Full FBA (Descriptive)

- Includes all methods in simple FBA
- Then utilizes direct assessment (observation) to verify initial hypotheses from indirect methods
- Product: functional hypotheses on why behaviors (undesirable and desirable) occur or do not occur
- Note: the product is the same as for indirect; but additional data is used
Direct observation to support FBA

- Many ways to observe, need to include antecedents and consequences, and possible motivating operations
- Should observe in problem and non-problem settings
- Observe frequently enough (?) to believe you understand pattern
- Compare to interview data and revise hypotheses
- Examples of observation types:
  - Scatter plot, ABC, interval timing
Functional Analysis

- Direct observation of problem behaviors under **direct manipulation** of different possible consequences, and comparison of the effects on problem behaviors
- Construction of FA occurs after functional interview (or equivalent) and identification of likely functions
- Most **accurate** FBA procedure but may take special skills or support
- Product: **functional hypotheses** on why behaviors (undesirable and desirable) occur or do not occur
Functional Analysis

- Can be done out of context (analog) or within problem settings (in vivo)
- Can be a ‘full’ or brief FA
- Can be done by teachers or setting staff
- Typical comparisons: attention condition, escape condition, play/control condition, alone condition, get tangible condition
- In all of these, misbehavior is consequated in different ways
- Sessions or comparison periods are relatively brief
- Continue sessions until **interpretable** results
What is needed?

- Pre-assessment gives an idea about possible or likely functions
- Materials from natural environment (classroom for example) associated with problem
- One or more ‘therapists/teachers’
- Scripts about interaction with student
- One or more outside observers.
Examples of conditions that may be compared

- **Play/control** - child is put in room (or in natural setting) given materials that are desirable and allowed to interact; no demands; possible non-contingent attention

- **Alone** — in sparse environment, no materials, little interaction

- **Social attention** — given task to do, attention to child only if misbehave

- **Escape** — given task, if misbehave remove task temporarily

- **Tangible** — have desirable activities/objects available, only give access if misbehave
Example of FA results: Attention maintained
Example of results: Multiple control

![Graph showing duration of time engaged in biting over sessions for different conditions: Alone, Contingent Escape, Contingent Attention, and Control.](image)
Example 1: FA in a special education classroom

- Bob, 6 yr. old boy with autism in a special education classroom
- Exhibited violent, aggressive tantrums
- Pre-assessment (interview and observations) suggested escape or attention or both functions maintained problem behavior
- Selected writing task; aide did procedures
Conditions

- Given writing tasks or leisure materials in classroom (depending on condition)
- **Attention** – given academic and leisure materials, no attention provided unless tantrums, then reprimand and comment
- **Escape** – gave writing activities and told to work (used prompt system), if tantrumed removed materials and turned away for 20 sec.
- **Control** – in play area, allowed to engage in leisure materials, aide played with him
- **Escape to attention** – same as escape except gave attention during escape for minor behaviors or continuing tantrum (more natural response)
Suggested interventions

- DRO for tantrums (must select quality reinforcer)
- Non-contingent breaks (to reduce reinforcing quality of escape)
- Functional communication training (ask for breaks which then given and faded)
Example 2: FBA/brief FA in classroom

- Jamarcus, a preschool boy showing aggressive behavior to peers
- Initial assessment was *simple FBA* (structured behavioral interview leading to hypotheses)
- Next assessment was *full FBA* — interview plus direct observation
- Next assessment was brief *FA*
- Finally, intervention based on assessment (DRO using praise) with reversal design
Example continued

- Brief functional analysis compared three conditions
  - **Attention**—mild reprimand for aggressive behavior
  - **Escape**—allowed to escape a task contingent on aggression
  - **Tangible**—gave access to preferred activity (pre-assessed) contingent on aggression
Example continued

- Results for Jamarcus
- All assessment hypotheses agreed (maintained by social attention)
- Function based intervention was successful
- Technical adequacy checks positive (integrity of procedures and data reliability and treatment acceptability)
Fig. 1 Brief functional analysis and intervention analysis for Jamarcus
Example 3: FA of disruptive behavior in classroom

- **Subjects**: 3 7-year olds with reading and behavior problems
- **Behaviors**: disruptive behaviors—name calling, out of seat, making noises, inappropriate vocalizations, etc.
- **Measure**: 10s partial interval for disruption; 10s momentary time sampling for off-task
- **Setting**: reading instruction
- **FBA**: teacher believed ‘getting out of work’ was cause; observations indicated likely teacher attention
**FA conditions (all 5 min.)**

- **Attention:** students given reading assignment, if disruptive/off task, teacher engaged them and asked questions about behavior
- **Escape:** teacher prompted students to read and praised if begun; if not, then materials removed for ~30 sec. and returned with prompt (ignored all behavior during period)
- **Play/control:** could read what they wished; teacher attended on schedule if not disruptive; responded to appropriate requests
Intervention

- Since all behaviors maintained by attention, used DRO and DRA combined
- DRO: momentary DRO (with extinction) 30 sec. using teacher attention
- DRA: DRA immediate attention to hand raised for question
FA case example

- **Student Information:**
  - Male 1st grader with Down’s Syndrome
  - Attended Suburban Elementary School
  - Spent part of his day in general education setting and part in special education setting
Target Behaviors

- Chair tipping and knocking over school materials
- Broadened to “rule breaking behavior”, which included:
  - Leaving center or task
  - Slamming drawers, doors, lids, etc.
  - Touching microwave
  - Pushing or tipping over chairs
  - Playing with sink or water fountain
  - Throwing materials
Assessment procedures

- Records Review
- Teacher Interview (FACTS)
- Informal Observations
- Brief, in-vivo functional assessment (FA)
Hypothesis

- Based on teacher interview alone, it was hypothesized that the function of the target behaviors was automatically reinforcing.
- Informal observations led to the hypothesis that the target behaviors were being maintained through escape, or escape-to-attention.
FA procedures

- **Four Conditions:**
  - Attention
  - Demand
  - Play
  - Escape-to-Attention

- 10 minute observation sessions using a 10 second partial interval recording method
Results

The graph shows the percent of intervals for different behaviors across several categories:

- **Attention**
- **Play**
- **Demand**
- **Escape-to-Attention**
- **Demand**

The x-axis represents intervals (1 to 5), and the y-axis represents the percent of intervals. The data points indicate the occurrence of rule-breaking behavior.
Intervention suggestions

- Make access to a high-probability response contingent upon the performance of a low-probability response

- Premack contingency in which escape from a negative reinforcer (i.e., difficult task) may be achieved through the completion of a designated portion of the task

- Subsequent trials may increase the complexity or duration of each task, as well as the number of tasks required to earn reinforcement (Fading)
Introduction to Intervention Planning
Objectives

- Understand the conceptual basis of intervention planning using the dimensions of ABA
- Match findings of FBA to appropriate intervention procedures
- Apply knowledge of the competing behavior model to antecedent and consequence manipulations for problem behavior reduction
Intervention based on the Dimensions of ABA

Solving behavior problems involves systematically applying the principles of behavior as we understand it (*conceptually systematic*).

Step 1: Clearly define (*behavioral*) the presenting problems that are deemed socially important (*applied*).
Step 2: Set goals that would be socially important (*effective*).
Step 3: Analyze the variables maintaining current problems (antecedents and consequences), expectations of settings (behaviors which should be reinforced), and degree of needed student skills (*analytic*) and make manipulations accordingly (*generality*).

Only after understanding the function of inappropriate behaviors can we decide what to change in order to improve things.
Intervention based on the Dimensions of ABA

All interventions should follow a FBA of some sort

- Linked to hypotheses about function

Interventions are all packages and could contain:

- Antecedent interventions
- Teaching skills, alternative behavior
- Differential reinforcement
- Extinction or punishment
- All of these with different change agents
The Idea of Concurrently Reinforced Behaviors

In conducting a functional assessment, we consider several classes of behaviors in the problem setting, each class with concurrent schedules of reinforcement and which could be exhibited

Matching Law predicts which behavior is more likely to occur
Intervention based on the Dimensions of ABA

The Generalized Matching Law expands this idea with considerations for:

- Magnitude of reinforcement (quality, duration, intensity)
- Timing of reinforcement (immediacy)
- Response effort

The Competing Behavior Model is a good way to conceptualize concurrent schedules of reinforcement for problem behaviors and can be useful in intervention planning.
Competing Behavior Model

BUILDING A SUPPORT PLAN

Summary Statement/Competing Behavior Pathways Diagram

Setting Event(s) → Anecdotal Trigger(s) → Desired Behavior → Maintaining Consequences

Problem Behavior → Maintaining Consequences

Alternative Replacement Behavior

Positive Behavior Support Plan Outline
Strategies that Make Problem Behaviors Irrelevant, Ineffective, and Inefficient

<table>
<thead>
<tr>
<th>Setting Event Strategies</th>
<th>Preventive Strategies</th>
<th>Teaching Strategies</th>
<th>Consequence Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are ways to change the context to make the problem behavior unnecessary?</td>
<td>What are ways to prevent the problem behavior?</td>
<td>What can be done to increase expected behaviors or to teach a replacement behavior?</td>
<td>What should happen when a problem behavior occurs?</td>
</tr>
<tr>
<td>□ Clarify rules and expected behavior for whole class</td>
<td>□ Reminders about behavior when problem is likely</td>
<td>□ Practice expected behavior in class</td>
<td>□ Reward/punishment program</td>
</tr>
<tr>
<td>□ Written contract with the students</td>
<td>□ Provide extra assistance</td>
<td>□ Self-management program</td>
<td>□ Contact with parents</td>
</tr>
<tr>
<td>□ Student self-manipulator sheet</td>
<td>□ Modify assignments to match student skills</td>
<td>□ Other</td>
<td>□ Reduced privileges</td>
</tr>
<tr>
<td>□ Change seating arrangements</td>
<td>□ Other</td>
<td>□ Time out</td>
<td>□ Office referral</td>
</tr>
<tr>
<td>□ Change schedule</td>
<td>□ Reprinad in class</td>
<td>□ Other</td>
<td>□ Other</td>
</tr>
</tbody>
</table>
Competing Behavior Model Example

**BEHAVIOR SUPPORT PLAN: COMPETING BEHAVIOR PATHWAY**

- **Desired Behavior**
  - Follows request and completes work independently

- **Consequence**
  - Earns points toward Lego time
  - Some positive

- **Antecedent**
  - When request or demand is made
  - Challenging task, for

- **Problem Behavior**
  - Aggressive Behaviors
  - Disruptive Behaviors (i.e. walking around)
  - Noncompliance

- **Consequence**
  - Removed and avoids task

- **Function**
  - Escape from demand or unpreferred activity

- **Alternative Behavior**
  - Requesting a break

**MO Strategies**

<table>
<thead>
<tr>
<th>MO Strategies</th>
<th>Antecedent Strategies</th>
<th>Behavior Teaching Strategies</th>
<th>Consequence Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutralizing Routine</td>
<td>Review expected behaviors</td>
<td>Teach/practice expected behaviors</td>
<td>Increase rewards for expected behavior</td>
</tr>
<tr>
<td>Increase communication between home and school</td>
<td>Change to less difficult task</td>
<td>Change expected behavior by teaching to raise hand and ask for a break or assistance</td>
<td>Increase immediacy/frequency and value</td>
</tr>
<tr>
<td></td>
<td>Chunk assignment</td>
<td></td>
<td>Do not remove the task expectations for misbehaviors</td>
</tr>
</tbody>
</table>

*(Make problem behavior irrelevant) (Make problem behavior inefficient) (Make problem behavior ineffective)*
Intervention based on the Dimensions of ABA

We use this information to manipulate the antecedent and consequent conditions for behavior reduction.

Problem behavior can be reduced by making it:

- Inefficient
- Ineffective
- Irrelevant
Making problem behavior irrelevant through...

Antecedent Manipulations
Conceptual Understanding of Antecedent Interventions

- SD’s – occasion behavior due to past correlation with increased availability of reinforcement
- MO’s – increase or decrease current frequency of behavior by altering nature of consequences
- Each can be manipulated to reduce the likelihood of undesirable behavior
- Providing choices (reduce likelihood of aversive task increasing escape behaviors) can also be conceptualized as antecedent intervention
Antecedent Intervention: Manipulation of Motivating Operations

- Goal is to create abolishing operations (AO) for reinforcement currently maintaining problem behaviors
  - Used in isolation or in combination with other intervention procedures
  - Decrease the effectiveness of reinforcers that maintain problem behavior
  - If negative reinforcement is issue, make escape less reinforcing
  - If positive reinforcement is issue, make consequence less reinforcing (like social attention) by satiation
  - Makes problem behavior irrelevant (or at least inefficient)

- Effects of MO’s are temporary (Smith & Iwata, 1997)
  - May not produce permanent improvements in behavior
  - Can be used simultaneously with other interventions to reduce problem behavior
Antecedent Intervention: Manipulation of Motivating Operations

Interventions with established experimental results:

- Noncontingent reinforcement (NCR)
- High-probability request sequence
- Use of neutralizing routines
- Providing choices of tasks (including ones that are associated with escape)
- Changing aversive environmental events (that were related to escape based behaviors) for example, reducing noise levels
Antecedent Interventions related to the SD

- Providing antecedent error correction to reduce task aversion
- Modifying error correction that makes task aversive (increases frequency of inappropriate escape based behaviors)
- Prompting appropriate behavior and reminding of contingencies (pre-correction)
- Removing problem stimulus
Making problem behaviors irrelevant through antecedent intervention

**Noncontingent Reinforcement**

- Stimuli with known reinforcing properties are delivered on a fixed-time (FT) or variable-time (VT) schedule independent of the learner’s behavior (Vollmer et al., 1993)
- The term is clearly a misnomer, since reinforcement involves a contingency
Making problem behaviors irrelevant through antecedent intervention

Noncontingent Reinforcement

- May effectively decrease problem behavior because reinforcers that maintain the problem behavior are available freely & frequently
- May function as an abolishing operation (AO)
- Referred to as *presenting stimuli with known reinforcing properties*
Making problem behaviors irrelevant through antecedent intervention

**Noncontingent Reinforcement**

- Uses three distinct procedures that identify & deliver stimuli with known reinforcing properties
  - Positive reinforcement
  - Negative reinforcement
  - Automatic reinforcement
Making problem behaviors irrelevant through antecedent intervention

Noncontingent Reinforcement

Using NCR effectively: Three key elements to enhance effectiveness

1.) Carefully consider amount & quality of stimuli with known reinforcing effectiveness of NCR
2.) Inclusion of extinction with NCR interventions
3.) Vary the available stimuli with NCR intervention to reduce problems of changing preferences
   - Proper utilization of information obtained through FBA
   - Correct identification of maintaining contingencies of reinforcement
Making problem behaviors irrelevant through antecedent intervention

**High-Probability Request Sequence**

- Referred to as high-p request sequence
- Delivery of a high-p request sequence involves:
  1. Presentation of a series of easy-to-follow requests for which the individual has a history of compliance (i.e. high-p requests)
  2. When individual complies with several high-p requests, provide individual with target request (i.e. low-p request)
Making problem behaviors irrelevant through antecedent intervention

**High-Probability Request Sequence**

- Behavioral effects of high-p request sequence suggests the abative effects of an AO by
  - Reducing the value of reinforcement for noncompliance to low-p requests
  - Reducing the aggression & self-injury typically associated with low-p requests
- Provides non-aversive procedure for improving compliance by diminishing escape-maintained problem behaviors
- May decrease excessive slowness in responding to requests & increase time used for completing tasks
<table>
<thead>
<tr>
<th>Participant</th>
<th>Low-(p) requests</th>
<th>High-(p) requests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bobby</td>
<td>Come here.</td>
<td>Touch your hair.</td>
</tr>
<tr>
<td></td>
<td>Sit down in your chair.</td>
<td>Touch your head.</td>
</tr>
<tr>
<td></td>
<td>Stand up.</td>
<td>Touch your hand.</td>
</tr>
<tr>
<td></td>
<td>Give me the...</td>
<td>Touch your eyes.</td>
</tr>
<tr>
<td></td>
<td>Pick up the...</td>
<td>Touch your ears.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch your nose.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch your chair.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch the floor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch the desk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch the wall.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch the cabinet.</td>
</tr>
<tr>
<td>Darren</td>
<td>Stand up.</td>
<td>Touch your head.</td>
</tr>
<tr>
<td></td>
<td>Sit down here.</td>
<td>Touch your eyes.</td>
</tr>
<tr>
<td></td>
<td>Put up the...</td>
<td>Touch your ears.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch your back.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Give me five.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clap your hands.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch your mouth.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch the puzzle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Touch the sticker.</td>
</tr>
</tbody>
</table>
Establishing replacement behaviors through...

Direct Teaching of Skills
Teaching Strategies

The following strategies are appropriate for intervention if the desired or expected behaviors are not currently in the individual’s repertoire:

- Discrete Trial Training
- Errorless learning/Prompt Fading
- Chaining
- Shaping
- Functional Communication Training

The goal of teaching strategies is to establish stimulus control so that desired behaviors will come in contact with reinforcement (natural or contrived)
‘Stages’ of learning from a behavioral perspective

Learning can be usefully characterized as moving through various stages, each stage having different goals, and using somewhat different methods (from Snell and Brown)

Instructional Hierarchy:

- Acquisition—learn it
- Maintenance—use it routinely
- Fluency/proficiency—speed it up and perfect it
- Generalization—use it many places and wherever needed
‘Stages’ of learning from a behavioral perspective

Acquisition: from not having it to exhibiting it under request

– Low error prompting strategies
– Dense reinforcement
– Careful specific error correction strategies
– Possible use of chaining
‘Stages’ of learning from a behavioral perspective

Maintenance: from doing it to regular, accurate use

- Modify ‘instructional requests’ and move towards natural stimulus control
- Thinning reinforcement
- Fading prompting strategies
- Goal is exhibition under specific natural criteria
‘Stages’ of learning from a behavioral perspective

Fluency
- Very few prompts and errors
- High practice opportunities
- Shift reinforcement to rate goals, and focus on natural control
- Shift reinforcement from instructional to natural
‘Stages’ of learning from a behavioral perspective

Generalization

- Adapt skill across settings
- Skill may become part of more complex skills
- Limited instructional trials per se
- Drop prompts and reinforcement used in instruction

Strategies to promote behavior across:

- Settings
- Instructors
- Materials
Basic Components

Antecedent stimuli
- The task stimulus (eventual SD)
- Establishing operation (may exert high control in certain instruction, like language—what is the motivation to communicate in a situation?)
- Prompts to get response to occur in presence of SD so reinforcement can occur
- Instructional structure to maximize success and minimize errors

Developing responses constituting skills
- Shaping
- Chaining

Immediate reinforcement and/or planned error correction
- Error correction highly planned to reduce instructional trials
- Differences across hierarchy

Focus on practice and opportunities to respond
- Generalization to natural settings for responding
Making problem behavior inefficient or ineffective through Consequence manipulation
Making problem behavior inefficient through Differential Reinforcement

Intervention involves reinforcing one response class instead of another (or punishing, or removing contingencies)

– When using DR to reduce problem behavior, this involves either:

  • Reinforcing a behavior(s) other than problem behavior
  • Or reinforcing a reduced rate of problem behavior(s)
  • Or, with some types of DRO, delaying reinforcement if a problem behavior occurs

Withholding reinforcement for problem behaviors (extinction) is often part of packages

DR can be teacher managed, self managed, home-school, or involve personnel outside of classroom
Making problem behavior inefficient through differential reinforcement

Types of Differential Reinforcement

- DRA: Differential Reinforcement of Alternative Behaviors
- DRI: Differential Reinforcement of Incompatible Behaviors
- DRO: Differential Reinforcement of Other Behaviors
- DRL: Differential Reinforcement of Low Rates of Responding
Making problem behavior inefficient through differential reinforcement

**DRA/I**

Often difficult to discriminate DRI from DRA, and it may not matter much

DRA: Differential Reinforcement of Alternative Behavior
– Reinforce occurrences of desirable alternative to problem behavior but that is not necessarily incompatible

DRI: Differential Reinforcement of Incompatible Behavior
– Reinforce a behavior that cannot occur simultaneously with problem behavior, FOR example reinforce staying in the seat (instead of being out of seat)
– Withhold reinforcement for instances of problem behavior
Making problem behavior inefficient through differential reinforcement

DRO

- Deliver reinforcer whenever the problem behavior has not occurred for a specific time
- “Reinforcement for not responding”
  - If problem behavior occurs it results in contingent delay of reinforcement (technically punishment)
  - If social attention is provided at time of misbehavior, it may be functional
- Remember the negative effects of punishment
Making problem behavior inefficient through differential reinforcement

**DRO**

- Length of interval should be similar to initial interval between responses
- Nature of contingent stimuli (points to be exchanged; tangible, etc.)
- Careful definitions of infractions
  - *Reset timer*: either do or do not; however there are implications
  - *Timing*: Attend to infractions immediately? (‘you talked out, so I will have to reset the timer’)
  - *Timing*: Don’t attend to infractions immediately? (at the end of the interval, “You talked out so you don’t earn a token’’)

Making problem behavior inefficient through differential reinforcement

DRL

- **Spaced responding DRL**
  - Reinforce if interval from last occurrence exceeds a set time

- **Interval DRL**
  - Divide the total session into a series of equal intervals of time
  - Provide reinforcement at the end of each interval in which the number of occurrences of target behavior is equal to or below predetermined criterion

- **Full-session DRL**
  - Reinforcement is delivered at the end of a session if during the entire session, the target behavior occurred equal to or fewer times than a predetermined criterion
What does it look like?
- Token board
- Group contingencies
Making problem behavior ineffective through punishment or extinction

**Considerations about using punishment**

- Punishment does not enhance specific positive behaviors
- There are often undesirable effects of punishment
- Ethical considerations
- Legal considerations
- Some forms are more acceptable than others
  - Response cost
  - Contingent reprimands
  - Non-exclusionary time-out (sit and watch)
Making problem behavior ineffective through punishment or extinction

Undesirable effects of punishment

- Countercontrol (overlaps and explained next)
- Avoidance of ‘punisher’
- Emotional and aggressive behaviors
- Undesirable modeling for children
- Negative reinforcement of ‘punisher’ behavior (immediate cessation is escape from aversive situation)
Making problem behavior ineffective through punishment or extinction

**Countercontrol**

- Much of our behavior is likely under aversive control (we behave to avoid aversive consequences) and this is clearly natural.
- One can avoid aversive outcomes through ‘doing what someone wants’ (who controls the aversive).
  - This, in essence, reinforces the ‘controller’
- Or by doing something that, for the controllee avoids aversives, but does not reinforce the controller (by complying one could ‘turn off’ the aversive, but the controller would be reinforced).
  - AVOIDANCE, ESCAPE, AGGRESSION, ETC.
- Not a separate principle of behavior; category of specific interactions.
Making problem behavior ineffective through punishment or extinction

Countercontrol

- Countercontrol appears to be very prevalent and is, of course, a product of learning history.
- It seems highly likely that people develop sophisticated repertoires of countercontrol behaviors that are on differing schedules across other people and situations.
- We have characterized countercontrol as a side-effect of punishment, but it is clearly a direct effect, and involves responses to attempted aversive control that are learned.
- Remember that all responses do not have to be reinforced to produce future increases.
Making problem behavior ineffective through punishment or extinction

Clinical Use of Punishment

Type 1 – Positive
- Reprimands
- Other contingent aversives
- Overcorrection
  - Restitutional
  - Positive practice

Type 2 – Negative
- Time out
  - Nonexclusion
  - Exclusion
  - isolation
- Response cost
Making problem behavior ineffective through punishment or extinction

**Punishment by presentation (Type I)**

Examples:
- Shock, lemon juice, water mist, shielding
- Reprimands
- Contingent exercise
- Overcorrection

- Most controversial has involved painful or noxious stimuli; these are mostly historic
- Reprimands are least controversial
Making problem behavior ineffective through punishment or extinction

**Overcorrection**

Both types require close supervision, may result in attention, and can lead to confrontation and resistance.

Restitutional overcorrection
- Student required to restore damaged environment and then some
  
Example: line cutting, stealing, cleaning up
- Problem if restitution not possible
- Issue of delay

Positive practice overcorrection
- Repeatedly perform correct behavior
Making problem behavior ineffective through punishment or extinction

**Time-out from Positive Reinforcement (Type 2)**

- The withdrawal of the opportunity to earn positive reinforcement, or
- The loss of access to reinforcers for a specified period of time
- Contingent upon the occurrence of a target behavior

If the effect of these is to decrease the future probability of the behavior, then this procedure has functioned as a punisher for the behavior
Making problem behavior ineffective through punishment or extinction

**Time-out Procedures**

- The discrepancy between “time-out” and “time-in” must be great.
- The loss of access to reinforcement must be contingent upon a target behavior.
- There is a resultant decrease in the future probability of the behavior (otherwise it is likely not time out from reinforcement because the EO that preceded the behavior was not a reinforcing, “time-in” environment).
Making problem behavior ineffective through punishment or extinction

**Time-out Procedures**

- **Nonexclusion**
  - Planned ignoring (contingent ignoring)
  - Contingent, temporary withdrawal of opportunity to earn a specific positive known reinforcer
  - Contingent observation (Sit and Watch)

- **Exclusion and isolation**
  - Time-out room (isolation)
  - Partition time-out (exclusion)
  - Hallway time-out (?)
Making problem behavior ineffective through punishment or extinction

**Planned Ignoring As Time Out**

- Systematically withholding attention for a specific amount of time contingent on behavior

- Can be signaled, examples:
  - Can be just withholding of attention (look away)
  - Light signals inappropriate behavior or level and no (specified) reinforcers may be earned
  - Contingent removal of something (music) for a time
  - Desk stimuli (color for example) indicating no attention or points for a while
Making problem behavior ineffective through punishment or extinction

<table>
<thead>
<tr>
<th>Desirable Aspects of Time-out</th>
<th>Undesirable Aspects of Timeout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of application for some types</td>
<td>Can be reinforcing for escape-based behavior</td>
</tr>
<tr>
<td>Acceptability (especially nonexclusion)</td>
<td>Misbehavior in TO room</td>
</tr>
<tr>
<td>Rapid suppression of problem behavior</td>
<td>Possibility of physical confrontation for exclusion/isolation, or when failure to comply for others</td>
</tr>
<tr>
<td>Easily combined with other procedures, such as differential reinforcement</td>
<td>High supervision and monitoring requirements for more exclusionary</td>
</tr>
</tbody>
</table>
Making problem behavior ineffective through punishment or extinction

Response Cost

- Loss of a specific amount of reinforcement (need a ‘reserve’)
- Contingent upon a target behavior
- Reduces the future probability of the target behavior
- Examples: reclaiming awards or stickers, “fines” (e.g., loss of tokens or money)
Making problem behavior ineffective through punishment or extinction

Response Cost

- Produces rapid decreases in the target behavior
- Convenient and easy to implement (can be incorporated into existing token or allowance programs)
- Is easily combined with other approaches (such as differential reinforcement)
Making problem behavior ineffective through punishment or extinction

**Response Cost**

- Have to have something to lose; may exhaust things to remove

- Increased aggression may occur
  - Ignore emotional outbursts when possible
    - Either don’t use response cost if this is expected
    - Or be prepared to ride out the storm

- Avoidance of the person who administers response cost or the setting may occur
  - These become “conditioned aversive stimuli”
  - Make sure positive reinforcement is available for appropriate behavior to reduce the likelihood of this outcome
Making problem behavior ineffective through punishment or extinction

**Response Cost**

- Collateral reductions of desirable behaviors may occur
  - Response cost may unintentionally suppress other, desirable behaviors, as well as the target problem behaviors
- Response cost calls attention to inappropriate behaviors
General Guidelines for Punishment

- Punishment should be used, if at all, as component of package containing reinforcement
- Positive first unless very mild; then consider punishment
- Careful consideration of ‘what if’ and possible undesirable effects
- Use consistently
- Make sure punisher is intense enough but not too intense
- Fade use of punishment if possible
- Monitor carefully and evaluate because of ethical concerns
Ethical considerations

- Right to safe and humane treatment
- Punishment alone does not address what to increase or maintain
- The idea of the ‘least restrictive alternative’ in reducing problem behaviors
  - Positive first and combining positive with punishment
- Right to effective treatment
  - Is punishment the only effective method?
- Policies and treatment safeguards
Making problem behavior ineffective through punishment or extinction

**Clinical Use of Extinction**

- The effectiveness of extinction is dependent primarily on the identification of reinforcing consequences and consistent application of the procedure.

- Extinction refers to behaviors maintained through either positive or negative reinforcement (or automatic reinforcement).
  - Has clinically undesirable effects (alone).
  - Extinction follows a non-linear pattern.
Making problem behavior ineffective through punishment or extinction

Clinical Use of Extinction

- May be difficult to completely place problem behaviors on extinction
  - May not be able to ignore
  - May not be able to control other sources of reinforcement (peer attention)
- Most likely used as component of intervention package
Making problem behavior ineffective through punishment or extinction

**Extinction Effects**

- Gradual Decrease in Frequency and Amplitude
- Extinction produced aggression

- Extinction Burst
  - An immediate increase in the frequency of the response after the removal of the positive, negative, or automatic reinforcement
  - Usually suggest reinforcer correctly identified

- Spontaneous Recovery
  - The behavior that diminished during the extinction process recurs even though the behavior does not produce reinforcement
  - Short-lived and limited if the extinction procedure remains in effect.
Making problem behavior ineffective through punishment or extinction

Variables Affecting Resistance to Extinction

- Continued responding during the extinction process
- Behavior that continues to occur during extinction is said to have better resistance to extinction than behavior that diminishes more quickly
- Intermittent reinforcement may produce behavior with greater resistance to extinction than the resistance produced by continuous reinforcement
  - some intermittent schedules may produce more resistant than others
  - to a degree, the thinner the intermittent schedule of reinforcement is the greater the resistance to extinction will be
Planning for generalization and maintenance of outcomes

Some things to always do when planning for generalization:

- Select target behaviors that will meet natural contingencies of reinforcement
- List all the behaviors that need to be changed and all the settings & situations in which the target behavior should (or should not) occur
- Systematically and carefully withdraw elements of the successful intervention (especially true for interventions involving prompts and reinforcement)
Planning for generalization and maintenance of outcomes

Strategies for Promoting Generalized Behavior Change

1. Teach the full range of relevant stimulus conditions & response requirements (increasing behavior)
2. Make the intervention setting similar to the generalization setting (for changes of both directions)
3. Maximize the target behavior’s contact with reinforcement in the generalization setting
4. Mediate generalization, including self management as an intervention or a way to shift control from other managed interventions
5. Train to generalize