Differential Reinforcement as a Way of Life

TIMOTHY R. VOLLMER

Co-authors
Meghan Deshais, Caldwell University
Faris Kronfli, University of Florida
Eliana Pizarro, University of Florida
Kerri Peters, University of Florida
Sarah Freeman, Marcus Center
My background
University of Florida with Brian Iwata, self-injurious behavior
Louisiana State University—School psychology
University of Pennsylvania—Medical school
University of Florida—schools, foster care, autism centers

Overview
I will review evidence that severe problem behavior is learned, operant behavior.
I will discuss the concept of “choice” as it relates to operant behavior.
I will describe how differential reinforcement is a logical treatment and should be adopted as a “way of life.”
I will describe ways of transferring behavioral treatment into everyday life via care provider training.
Behavior Disorders/Problem Behavior

Self-Injurious Behavior (SIB)
Aggression
Property Destruction
Tantrums
Severe Stereotypic Behavior
Classroom Disruptive Behavior

Operant Functions of Behavior Disorders

Socially mediated positive reinforcement
Socially mediated negative reinforcement
Automatic positive or negative reinforcement
Examples of socially mediated positive reinforcement maintaining problem behavior

Attention in the form of comfort statements
Attention in the form of proximity
Attention in the form of reprimands
Attention in the form of social interaction
Tangible items such as preferred toys, food items, drinks, videos, computers, etc.

Examples of socially mediated negative reinforcement

Escape or avoidance of instructional activity (includes reduced duration of instructional activity)
Escape or avoidance of self-care or daily living routines
Escape or avoidance of medical routines
Escape or avoidance of aversive sounds or situations
Important Note:

Sometimes the individual has alternative behavior, such as communication, in their repertoire, but...

Problem behavior produces consequences more reliably and more immediately

Examples of automatic reinforcement

The sensation produced by the behavior functions as positive reinforcement.

Behavior, such as self-scratching, temporarily attenuates aversive stimulation.

Bio-behavioral theories (e.g., endorphin hypothesis).
Functional analysis

An experimental manipulation of independent variables thought to potentially control target behavior (the dependent variable).

The term has a more general meaning, but has come to be used to refer to a specific type of assessment for behavior disorders.

The utility of a FA

Scientific: To learn more about the nature of and controlling variables for behavior disorders.

Research screening: To identify appropriate subjects for a research question.

Clinical assessment: To isolate variables maintaining or suppressing problem behavior.
Negatively reinforced (escape) behavior

Slocum & Vollmer, 2015
Revisiting Differential Reinforcement of Alternative Behavior

Old definition: Reinforcement of some alternative response while placing the problem behavior on extinction.

New definition: Providing greater reinforcement, along at least one dimension, for alternative behavior in comparison to reinforcement for problem behavior.
Differential Reinforcement

Minimize reinforcement for problem behavior (preferably via extinction— withholding reinforcement*)

Maximize reinforcement for appropriate alternative behavior
Differential Reinforcement of Alternative Behavior (DRA)

- DRA is essentially a concurrent schedule.
- Baseline circumstances (reinforcement schedules) usually favor problematic behavior.
- Treatment circumstances represent schedules that favor appropriate behavior.
- Ideally, Extinction vs. Reinforcement.
- However, there are circumstances when extinction is not possible or practical.

Examples of factors influencing the application of extinction schedule

- Treatment integrity failures.
- Legal or ethical requirement to block attention-maintained self-injury or aggression.
- Extinction burst is too dangerous.
- Automatic reinforcement.
- Large and/or fast individuals may produce escape even if we attempt escape extinction.
The Matching Law

In a concurrent arrangement, the relative rate of one response alternative will essentially “match” the relative rate of reinforcement available for that response alternative.

Matching in Pigeon Key Pecks

Proportion of Responses on Key A

Proportion of Reinforcement for Key A

Herrnstein, 1961
Matching in College Basketball: 2 and 3 point shots

Proportion of 3 pt shots

Proportion of Reinforcement for 3 pt shots

Bourret & Vollmer, 2000

Matching in Child Problem Behavior

Borrero & Vollmer, 2002
What do Behavior Analysts mean by “choice”?

- Allocation of responding on two or more response alternatives
- Each alternative is associated with some schedule of reinforcement, punishment, or both
- Allocation of responding is governed by the outcome of responding (consequences to behavior)
Other factors influencing response allocation

- Quality of reinforcement
- Magnitude/duration of reinforcement
- Delay to reinforcement
- Response effort
- Punishment

Borrero et al. (2005)
Differential Attention: Baseline Example

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<tr>
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<th>Aggressive Behavior</th>
<th>Appropriate Behavior</th>
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<tbody>
<tr>
<td>Probability of Attention</td>
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<tr>
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Using Differential Reinforcement

Maximize reinforcement for appropriate behavior

Present only the minimal amount of reinforcement necessary for inappropriate behavior; when possible, this would be none at all

Just remember this rule of thumb: Maximize/Minimize

Translating to everyday life
Care providers make errors

- Errors are made by care providers of all sorts.
- These errors can be interpreted as resulting from contingencies of reinforcement and punishment.
- As behavior analysts, we should be exploring contingencies on care provider behavior, rather than complaining when they do not follow our rules or instructions.

Care Provider Errors

- **Delivery of potential reinforcers for problematic behavior**
- Failure to promote independence
Attention as an Example

Attention given disruptive behavior

Vollmer et al., 2001
Why?

Contingencies Influencing Care Provider Reprimanding

• It is likely that the child’s behavior is an aversive stimulus
• If the child’s behavior temporarily goes away when the reinforcer is delivered, a possible negative reinforcement contingency maintains the care provider’s behavior.
• If care provider behavior produces problem behavior, the care provider behavior is likely punished
• Rules provided by behavior analysts relate to delayed and probabilistic contingencies that the care provider may have never contacted
• We should not be surprised these rules do not work; they cannot compete with immediate reinforcement
Sloman et al., 2005

3 instances of problem behavior before the reprimand
1 instance of problem behavior after the reprimand

Sloman et al., 2005
Sloman et al., 2005

Instances of Problem Behavior

Seconds Before and After Reprimands

Sloman et al., 2005
Escape/Avoidance as an Example
Three Cases (FAs Showing Escape Behavior)

1. Probability of problem behavior given instruction:
   Child 1: .93
   Child 2: .89
   Child 3: .67

2. Probability of problem behavior given casual social interaction:
   Child 1: .12
   Child 2: .15
   Child 3: .04

3. Probability of problem behavior given no social interaction:
   Child 1: 0
   Child 2: 0
   Child 3: .02

One Possible Solution:
Competency-Based Training
Competency-Based Parent Training Accomplishes Two Aims

1. Brings the parent’s behavior into contact with the reinforcer of reduced child problem behavior and increased appropriate behavior, and…

2. Results in correspondence between the behavior analysts instructions and longer-term outcomes
Preferred toys

**Mand**

**Problem Behavior**

**Session**

**Responses Per Minute**

- **Ignore**
- **Attention**
- **Tangible**
- **Control**
- **Escape**
Marcus, Swanson, & Vollmer, 2001

Behavioral Skills Parent Training

Identify effective treatment in highly controlled circumstances, then:

Step 1: Didactic interaction
Step 2: Role play A—parent as kid
Step 3: Role play B—therapist as kid
Step 4: Immediate feedback
Step 5: Delayed feedback
Step 6: Monitoring and follow up
Booster training as necessary
Conclusions

• Problem behavior is often predictable and lawful
• Differential reinforcement is an ideal treatment because it involves minimizing reinforcement for problem behavior and maximizing reinforcement for appropriate alternative behavior
• The matching law is useful in developing interventions, especially when extinction is not likely or even not possible
• Care-provider behavior is sensitive to contingencies of reinforcement and punishment
• It is our job to understand those contingencies in order to implement successful interventions
• Differential reinforcement is not just a treatment, it is a way of life!