

## Antecedent Interventions

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## Overview

- I will provide a brief overview of my lab sites.
- I will (very briefly) describe the known “operant functions” of behavior disorders.
- I will contrast “antecedent” and “consequence” based interventions.
- I will present the logic of “noncontingent reinforcement” as an example of antecedent-based treatment.
- I will conclude with some suggestions for application.

## Major areas of research

- Assessment of behavior disorders
- **Treatment of behavior disorders maintained by social reinforcement contingencies**
- Treatment of behavior disorders maintained by automatic reinforcement
- Parent, teacher, and care provider training

## My career

- University of Florida
- Louisiana State University
- University of Pennsylvania (Children’s Seashore House)
- University of Florida

## Our autism/intellectual disabilities lab

- School-based research

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- Our new behavior analysis research clinic

### Our autism/intellectual disabilities lab

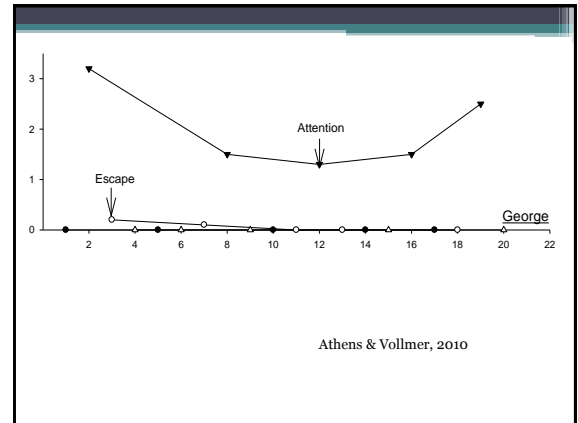
- School-based research
- Our new behavior analysis research clinic
- Consultation

### Behavior Disorders in Autism and Intellectual Disabilities

- Self-injurious Behavior (SIB)
- Aggression
- Property Destruction
- Tantrums
- Severe stereotypic behavior
- Among others

### Operant Functions of Behavior Disorders

- Socially mediated positive reinforcement
- Socially mediated negative reinforcement
- Automatic positive or negative reinforcement



### Functional Analysis Results: Social Positive Reinforcement-Tangible

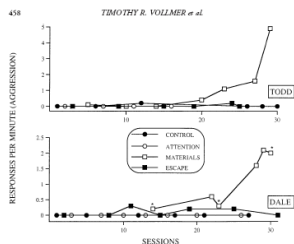


Figure 1. Results of the functional analysis for both participants. For Timothy (upper panel), aggression was highest in food reinforcement (tangible condition). For Dale (lower panel), aggression was highest in positive reinforcement in the form of food and television access. Sessions in which television access was tested are marked with an asterisk.

Vollmer et al. (1999)

### Functional Analysis Results: Social Negative Reinforcement-Escape

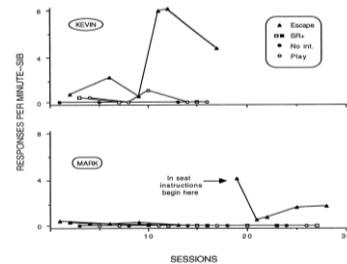


Figure 1. Responses per minute of SIB across assessment conditions.

Vollmer et al. (1995)

## Functional Analysis Results: Automatic Reinforcement

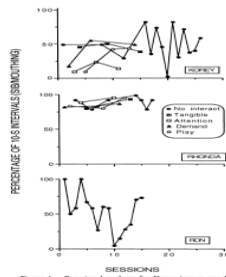


Figure 1. Functional analysis results for three subjects (Cody, Frankie, and Zach) showing the percentage of internal substitution across four conditions: Baseline, Antecedent, Consequence, and Extinction.

Vollmer et al. (1994)

## Antecedent vs. Consequence-based interventions

- Antecedent-based interventions aim to reduce the “motivation” to engage in problematic behavior.
- Consequence-based interventions aim to eliminate reinforcement for the problematic behavior and teach replacement behavior via differential reinforcement.

## Differential Reinforcement

- Problematic behavior is sometimes what behavior analysts call “choice” (defined shortly).
- Differential reinforcement involves essentially “stacking the deck” in favor of appropriate behavior.
- This approach can be easily remembered by the simple rule of thumb: Maximize/Minimize (to be discussed).

## 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.
- Automatic reinforcement.
- Large and/or fast individuals may produce escape even if we attempt escape extinction.

## Differential Attention Baseline example

	Aggressive Behavior	Appropriate Behavior
Probability of Attention	1.0	0.2
Delay to Attention		
Quality of Attention		
Duration of Attention		

### Differential Attention Baseline example

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Delay to Attention	< 3 sec	on average > 20 sec
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Duration of Attention		

### Differential Attention Baseline example

	Aggressive Behavior	Appropriate Behavior
Probability of Attention	1.0	0.2
Delay to Attention	< 3 sec	on average > 20 sec
Quality of Attention	Verbal and Physical Attention	Brief Verbal Attention
Duration of Attention	> 20 sec	< 3 sec

### Differential Attention Solution

	Aggressive Behavior	Appropriate Behavior
Probability of Attention	1.0	1.0
Delay to Attention		
Quality of Attention		
Duration of Attention		

### Differential Attention Solution

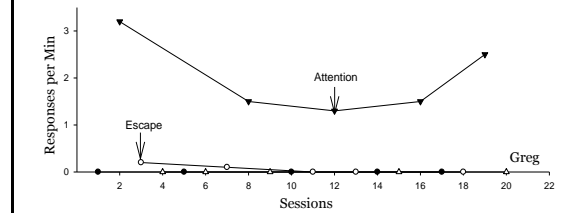
	Aggressive Behavior	Appropriate Behavior
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### Differential Attention Solution

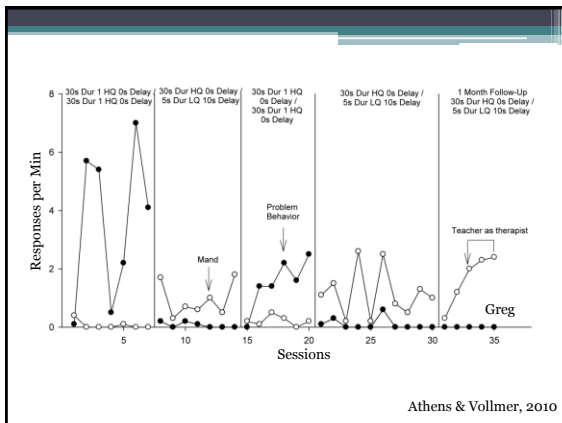
	Aggressive Behavior	Appropriate Behavior
Probability of Attention	1.0	1.0
Delay to Attention	< 3 sec	< 3 sec
Quality of Attention	Physical Attention	Verbal and Physical Attention
Duration of Attention		

## Differential Attention Solution

	Aggressive Behavior	Appropriate Behavior
Probability of Attention	1.0	1.0
Delay to Attention	< 3 sec	< 3 sec
Quality of Attention	Physical Attention	Verbal and Physical Attention
Duration of Attention	< 10 sec	> 20 sec



Athens &amp; Vollmer, 2010



Athens &amp; Vollmer, 2010

## Noncontingent Reinforcement

### What is NCR?

- Reinforcer is delivered on a fixed time schedule
- The subject's behavior does not influence the schedule of reinforcer delivery
- The scheduled is thinned from a rich schedule to a relatively lean, more manageable schedule

### Why evaluate NCR as treatment?

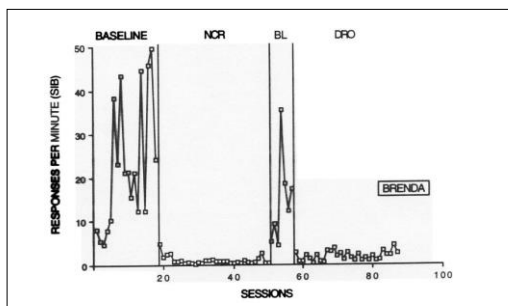
- Basic research has shown that response-independent schedules (FT or VT) functional similar to extinction.
- Applied acquisition research has shown that acquired behavior decreases when reinforcers are delivered noncontingently.
- Advances in assessment have allowed us to identify specific sources of reinforcement maintaining aberrant behavior.
- Potential limitations of differential reinforcement may justify the evaluation of alternative procedures.

## Some limitations of DRO

- Several reviews have concluded that DRO is a relatively ineffective procedure.
- Sometimes produces extinction-induced behavior.
- Can be cumbersome to implement.
- If DRO interval is too long, it can produce extremely low rates of reinforcement.

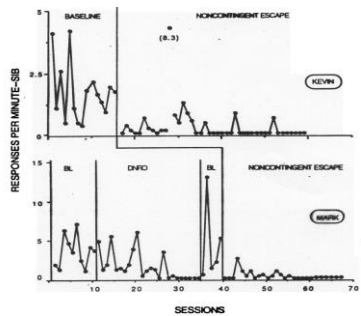
Vollmer et al., 1992

## NCR Treatment



Vollmer et al., 1995

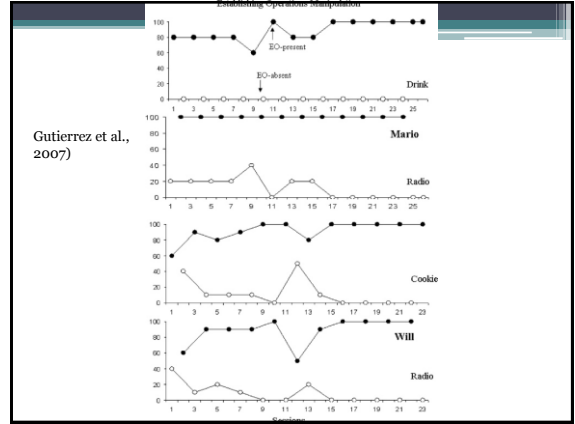
## Treatment-NCE



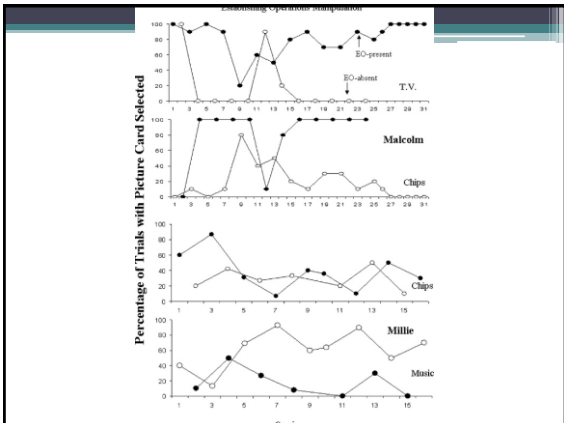
Marcus & Vollmer (1996)



# Gutierrez et al. (2007)



Gutierrez et al., 2007)



## Suggestions

- Use NCR in crisis situations, by completely eliminating the establishing operation for the target behavior.
- Combine NCR with differential reinforcement in order to teach or strengthen alternative behavior.
- Very gradually thin the schedule of reinforcement.

### Differential Attention Solution

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