

## Chapter 8: Extinction & Stimulus Control

### Extinction

- Side effects of extinction
- Resistance to extinction
- Spontaneous recovery
- Differential reinforcement of other behavior

## What is extinction?

- Well, when you think about the role or reinforcement, you realize that reinforcement is the “jet fuel” that keeps behaviors going.
- Without reinforcement, there would be nothing supporting the behavior
- And it would . . . . die out!

## Extinction

- Extinction =
  - Lever Press (R) → Food (S<sup>R</sup>)
  - Lever Press (R) → No Food
- Examples:
  - A professor stops giving extra credit to attend research talks in the department.
  - A dog no longer gets praised or a doggie treat for doing a trick.

## Extinction

- Need to be sure that consequence being withheld is

### Example

You believe that chocolate is maintaining a child's tantrum throwing behavior, but in reality it is the attention the child receives from his mother. In this case, withholding chocolate will not extinguish the child's tantrums.

## Extinction

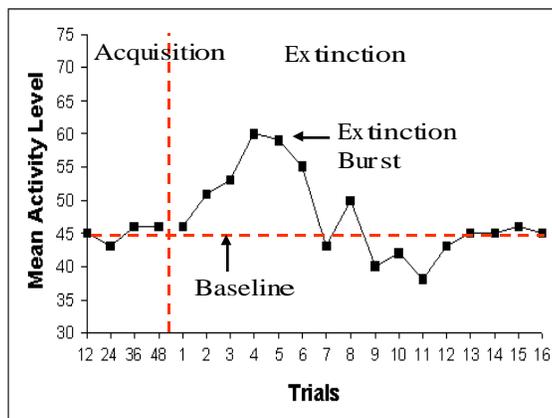
- You can use extinction (taking away the reinforcer) as
  - Example: Parent would always pick up a toy that the child drops on the ground. Child begins to throw the toy on the ground on purpose. So, parents do not pick up a toy that was thrown on purpose and that behavior decreases.
- The good news is that with extinction you have another tool in your belt to reduce unwanted behavior besides punishment
- The bad news is that using it has side effects, just like we will see with punishment (ch 9)

# Extinction

- Side effects of extinction
  1. Extinction burst
  2. Increase in variability
  3. Emotional behavior
  4. Aggression
  5. Resurgence
  6. Depression

# Extinction

## Extinction burst



### Example

“Don’t walk” signal when waiting to cross the road (e.g., VI 2 min schedule).

If the signal does not change after 3 mins then press the button more frequently and forcefully.

## Extinction

### 2. Increase in variability

- Extinction can result

#### Example

The key normally used to unlock your front door does not work. You begin to hold the key differently, not push it all the way in, turn the key upside down etc.

## Extinction

### 3. Emotional behavior

- Extinction can

#### Example

When the key fails to unlock your front door you show signs of agitation and frustration (e.g., shaking, heart-rate increases, sweating)

## Extinction

### 4. Aggression

#### Example

When the key fails to unlock your front door you might show signs of aggression by thumping the door, kicking the lock, blaming your partner for 'doing something' to the lock or key

## Extinction

### 5. Resurgence

– Reappearance of

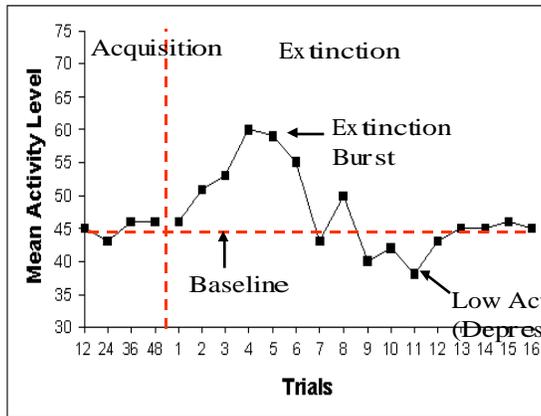
#### Example

When waiting to cross the road and the 'Don't Walk' signal does not change after 3 mins then you might decide to cross the road in another location, or cross on the red signal (if these behaviors have produced reinforcement in the past)

# Extinction

## 6. Depression

- When extinction trials are implemented,



- Low activity (depression)

### Example

At the end of a relationship people stop engaging in activities that once were pleasurable

## Resistance to Extinction

- When you reinforce any behavior, the way you have done it will
- Let's think of some VERY persistent behaviors
  - Gambling
  - Begging
  - ???
  - ???

## Resistance to Extinction

- Resistance to extinction
  - The extent to which responding continues
  - In plain English, this means that it is how long the behavior continues after you have taken away the reinforcer
  - So what factors affect just how persistent a behavior will be?

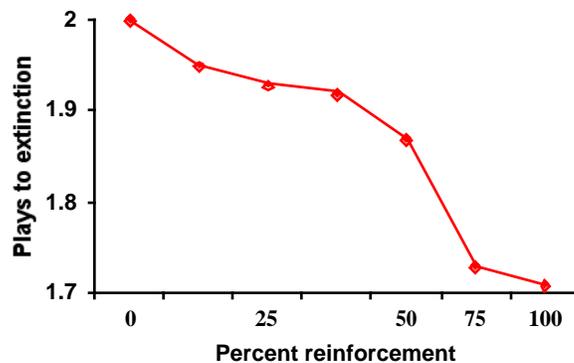
## Resistance to Extinction

- Resistance to extinction can be affected by a number of factors
  1. Schedule of reinforcement
  2. History of reinforcement
  3. Magnitude of the reinforcer
  4. Degree of deprivation
  5. Previous experience with extinction
  6. Distinctive signal for extinction

## Resistance to Extinction

- Schedule of reinforcement is the most important factor influencing resistance to extinction
  - Behavior that has been maintained on an intermittent schedule of reinforcement (e.g., VR; VI; FR; FI) is
    - The less often a behavior is reinforced the
      - Ex. Coke machine vs. slot machine
- Lewis & Duncan (1956)
  - Ps told they would earn 5c every time they won when playing slot machines
  - Ps were reinforced between 0-100 percent of responses for the first 8 plays – then no reinforcement

## Resistance to Extinction



Results:

- Lower percent of reinforced trials, the longer students continued to play after reinforcement stopped.

## Resistance to Extinction

### 2. History of reinforcement

- 
- Bar-pressing behavior will extinguish more quickly in a rat reinforced for bar-pressing 10 times than 200 times

### 3. Magnitude of reinforcer

- 
- Bar-pressing will extinguish more rapidly if rat is rewarded with small amount of food than if rewarded with large amount of food

## Resistance to Extinction

### 4. Degree of deprivation

- 
- Hungry rats will show greater resistance to extinction of bar-pressing than less hungry rats

## Resistance to Extinction

### 5. Previous experience with extinction

- Extinction sessions are alternated with reinforcement sessions
- 
- Bar-pressing in rats will rapidly extinguish if the rat has previously been exposed to a number of extinction sessions

### 6. Distinctive signal for extinction

- discriminative stimulus for extinction = faster extinction

## Do responses weaken and die easily?

- No! They tend to weaken a little more each time they occur
  - Example: If you are no longer reinforcing tantrum-throwing, the child is unlikely to give up after the first episode
    - It will take several times of ignoring the tantrum before it is likely to permanently weaken.
    - Even then, it might reoccur occasionally without warning!

## Spontaneous Recovery

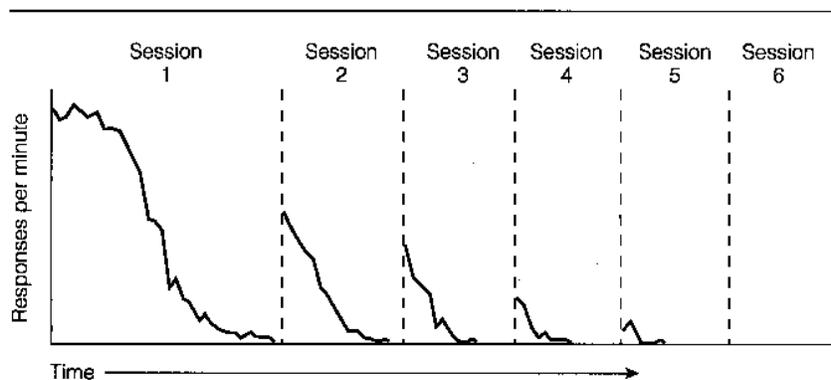
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- The phenomenon of *spontaneous recovery* suggests that the response is not permanently eliminated

### Example

A rat is conditioned to bar-press for food, an extinction process is then implemented and bar-pressing is extinguished. The next day the rat is placed back in the Skinner Box and begins to bar-press.

## Spontaneous Recovery

- The data below show the effects of spontaneous recovery across repeated sessions of extinction
- The recovered behavior is



## Want to make extinction more effective?

- How about reinforcing a replacement behavior at the same time as you are trying to extinguish an unwanted behavior?
- If you try this strategy, you are using . . .

## DRO

- **Differential Reinforcement of Other Behavior**
  - Reinforcement of
  - Used to eliminate a behavior
  - Example:
    - Reward a child for doing any other activity than sucking her thumb.

## DRI

- Differential reinforcement of incompatible behavior (DRI) -- a type of DRO
  - Similar to DRO, but rewarded for performing a behavior that is
  - Used to eliminate a behavior

### Example

- If trying to eliminate disruptive classroom behavior reward a child for sitting quietly
- More effective than extinction because behavior is weakened by lack of reinforcement and alternative incompatible behavior replacing it is strengthened

## DRO vs DRI

- Example: Trying to eliminate arguing behavior.
  - Reinforcing anything other than arguing behavior is DRO while reinforcing cooperative behaviors is DRI