

# Learning



## Operant Conditioning

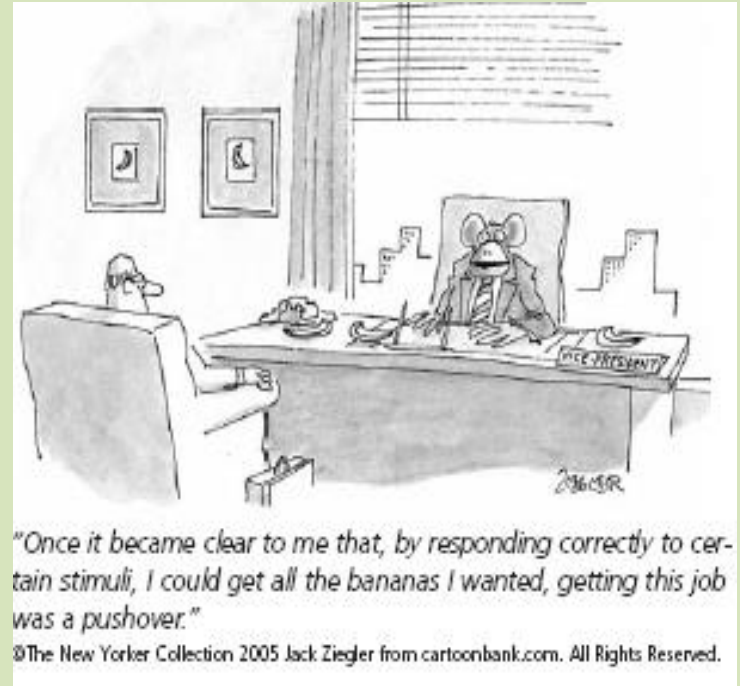
- **Operant conditioning** - the learning of voluntary behavior through the effects of pleasant and unpleasant consequences to responses.
  
- **Thorndike's Law of Effect** - law stating that if a response is followed by a pleasurable consequence, it will tend to be repeated, and if followed by an unpleasant consequence, it will tend not to be repeated.
  - Getting paid for cleaning one's room will lead to more cleaning.
  - Getting in trouble after taking the car without asking will result in not taking the car.

**FIGURE 5.5 Thorndike puzzle box**  
A typical Thorndike puzzle box. The cat is placed inside the box and can get out by pushing on the little platform to one side of the door—at first, accidentally. Each time the cat managed to escape, it would be put back into the box until, through trial and error, it knew to push on the platform to open the door.

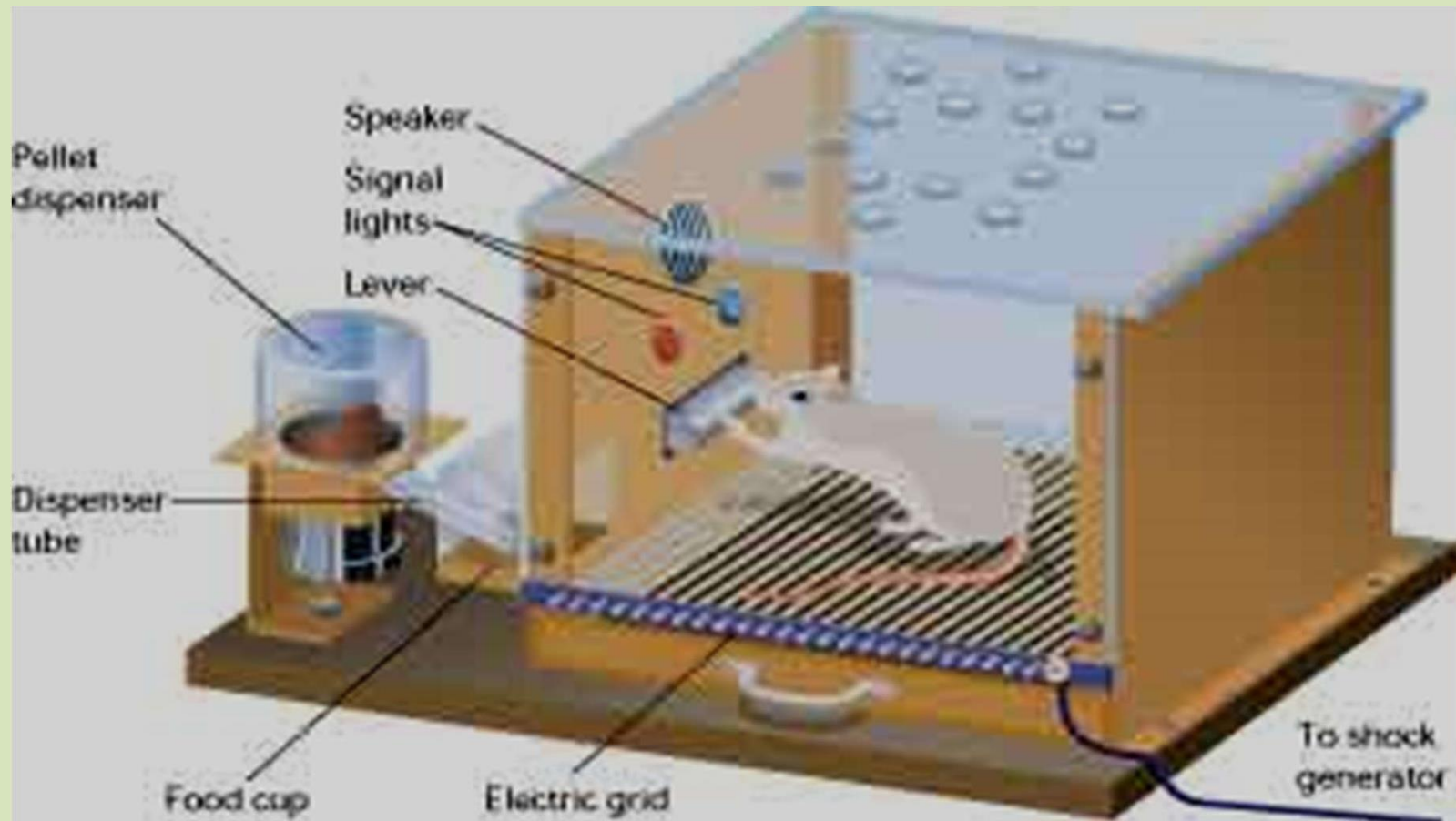


## Skinner's Contribution

- Behaviorist, B. F. Skinner, wanted to study only observable, measurable behavior.
- He gave “operant conditioning” its name.
  - **Operant** - any behavior that is voluntary.
- Learning depends on what happens *after* the response — the consequence.



# Operant Conditioning (The “Skinner Box”)







## Reinforcement

- **Reinforcement** - any event or stimulus, that when following a response, increases the probability that the response will occur again.
  - **Primary reinforcer** - any reinforcer that is naturally reinforcing by meeting a basic biological need, such as hunger, thirst, or touch.
  - **Secondary reinforcer** - any reinforcer that becomes reinforcing after being paired with a primary reinforcer, such as praise, tokens, or gold stars.



## Positive & Negative Reinforcement

- **Positive reinforcement** - the reinforcement of a response by the addition or experiencing of a pleasurable stimulus.
- **Negative reinforcement** - the reinforcement of a response by the removal, escape from, or avoidance of an unpleasant stimulus.



Example:  
Taking aspirin for a headache is negatively reinforced – removal of headache!



# Punishment

**Punishment** - any event or object that, when following a response, makes that response less likely to happen again



**Punishment by application (positive punishment)**- the punishment of a response by the addition or experiencing of an unpleasant stimulus

**Punishment by removal (negative punishment)**- the punishment of a response by the removal of a pleasurable stimulus

## How to Make Punishment More Effective



1. Punishment should immediately follow the behavior it is meant to punish.
2. Punishment should be consistent.
3. Punishment of the wrong behavior should be paired, whenever possible, with reinforcement of the right behavior.

## TABLE 5.2 NEGATIVE REINFORCEMENT VERSUS PUNISHMENT BY REMOVAL

### Example of Negative Reinforcement

Stopping at a red light to avoid getting in an accident.

Mailing an income tax return by April 15 to avoid paying a penalty.

Obedying a parent before the parent reaches the count of "three" to avoid getting a scolding.

### Example of Punishment by Removal

Losing the privilege of driving because you got into too many accidents.

Having to lose some of your money to pay the penalty for late tax filing.

Being "grounded" (losing your freedom) because of disobedience.

# Shaping

- **Shaping** - the reinforcement of simple steps in behavior that lead to a desired, more complex behavior.



TABLE 5.1 COMPARING TWO KINDS OF CONDITIONING

**Operant Conditioning**

Goal is to increase the rate of an already occurring response.

Responses are voluntary.

Consequences are important in forming an association.

Reinforcement must be immediate.

An expectancy develops for reinforcement to follow a correct response.

**Classical Conditioning**

Goal is to create a new response to a stimulus that doesn't normally produce that response.

Responses are involuntary and reflexive.

Antecedent stimuli are important in forming an association.

CS must occur immediately before the UCS.

An expectancy develops for UCS to follow CS.

## Continuous VS Partial Reinforcement

- **Continuous reinforcement** – when an organism receives a reinforcer each time it displays a behavior
  - This reinforcement schedule is the quickest way to teach an organism a behavior; especially effective in training a new behavior.
- **Partial reinforcement** – an organism does not get reinforced every time it displays a behavior
  - There are several different types of partial reinforcement schedules. They include: **fixed interval**, **variable interval**, **fixed ratio**, **variable ratio**.



## Schedules of Reinforcement

***Fixed*—determined  
(known)**

***Variable*— undetermined  
(unknown)**

***Ratio*—number of responses**

***Interval*—passage of time**

## Fixed Ratio

**The reinforcer is given only after a *specified number* of responses.**

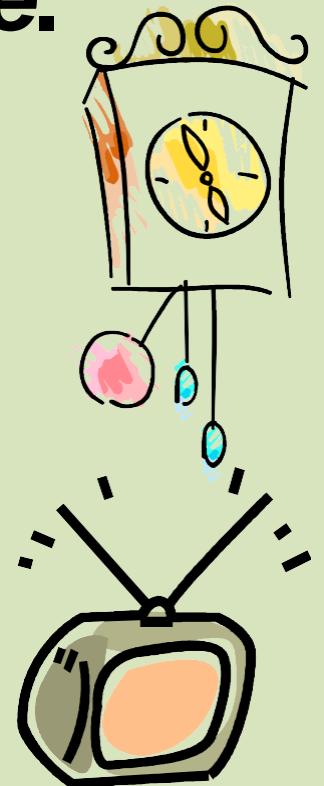
*Example: John gets a paycheck for every five days he substitutes.*



## Fixed Interval

**The reinforcer is given following the first response occurring after a pre-determined *period of time*.**

*Example: Steve sits in front of the television every Thursday night at 7:00 p.m. sharp because he knows that his favorite show comes on at that time.*



## Variable Ratio

**The reinforcer is obtained only after a varying number of responses have been made.**

*Example: Marty continuously hits the jackpot after pulling the lever on a slot machine for so many undetermined tries.*



## Variable Interval

**The reinforcer is given following the first response occurring after a variable amount of time.**

*Example: Dale sits on the dock for hours waiting to catch a fish every now and then.*

TABLE 5.3 FOUR WAYS TO MODIFY BEHAVIOR

	Reinforcement	Punishment
<b>POSITIVE</b> (Adding)	Something valued or desirable; <i>Positive Reinforcement</i> Example: getting a gold star for good behavior in school	Something unpleasant; <i>Punishment by Application</i> Example: getting a spanking for disobeying
<b>NEGATIVE</b> (Removing/ Avoiding)	Something unpleasant; <i>Negative Reinforcement</i> Example: avoiding a ticket by stopping at a red light	Something valued or desirable; <i>Punishment by Removal</i> Example: losing a privilege such as going out with friends



## Techniques in Operant Conditioning

- **Behavior modification** - the use of operant conditioning techniques to bring about desired changes in behavior.



**Token economy** - type of behavior modification in which desired behavior is rewarded with tokens.

**Time-out** - a form of mild punishment by removal in which a misbehaving animal, child, or adult is placed in a special area away from the attention of others.

- Essentially, the organism is being “removed” from any possibility of positive reinforcement in the form of

