

Two dolphins are captured in mid-leap, emerging from the deep blue ocean. They are moving towards the right side of the frame, leaving a trail of white water splashes behind them. The sky above is a clear, vibrant blue with a few wispy white clouds. The dolphins' bodies are sleek and grey, with a lighter patch on their bellies. The overall scene is dynamic and energetic.

# Chapter 7 Learning

# Learning



- Learning is the relatively permanent change in an organism's behavior due to experience.

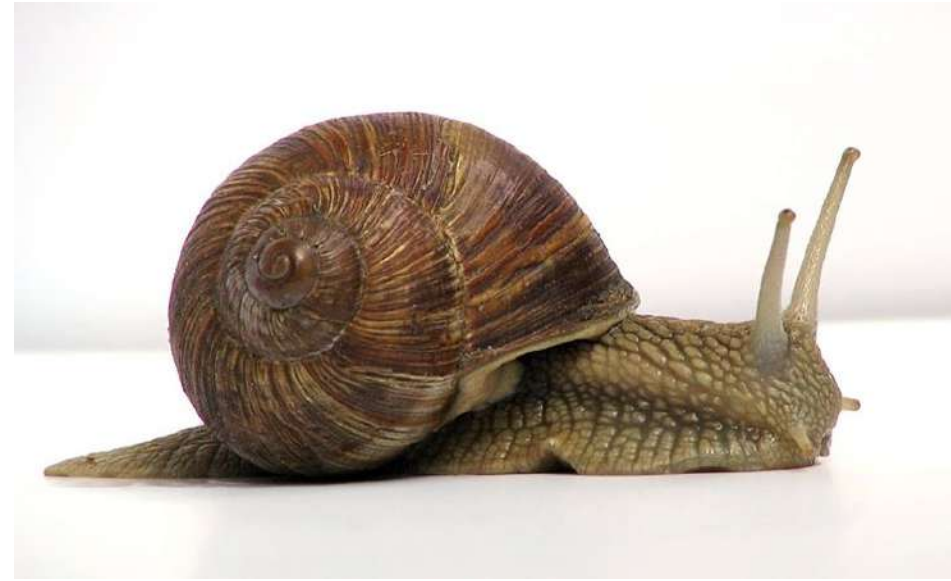
# Learning



The Mexican Gray wolves had problems after being released back into the wild, because they were bred in captivity and incapable of associating certain behaviors with certain characters.

# Learning

**When shots of electric shocks are coupled with squirts of water, the snail will learn to associate the two behavior together. Also known as response- outcome or associative learning. The animals start to learn how to predict a possible behavior.**



# Learning



Conditioning is the process of learning associations.

Consider the following example:

How does the following music  
make you feel?

Is this something you are familiar  
with?

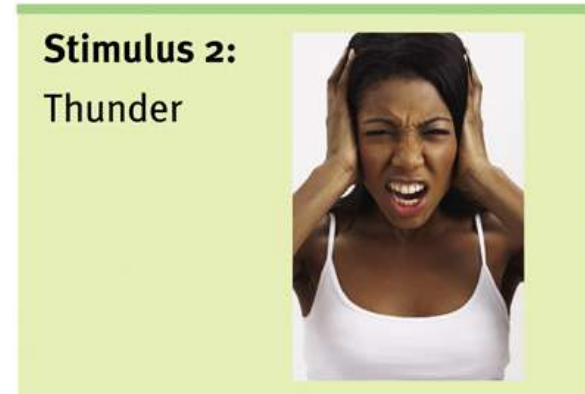
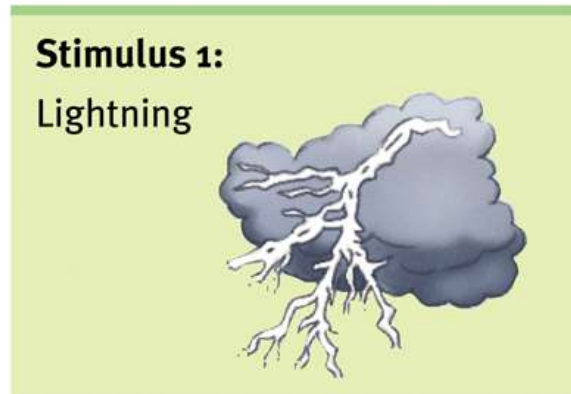
How did this music elicit this  
feeling?

Answer: **Associations**.....

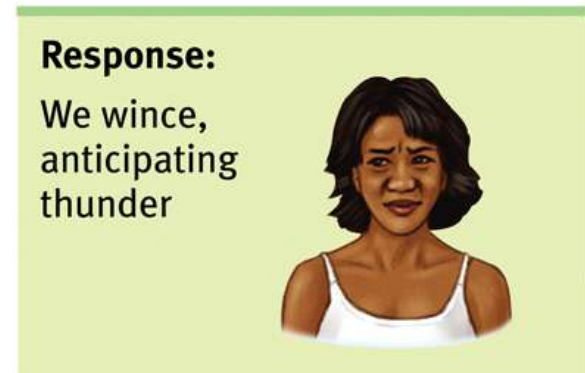
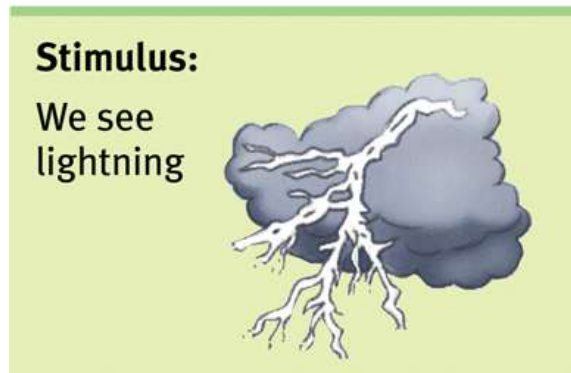
# Learning

**Classical conditioning is learning to associate two stimuli and thus to anticipate certain events.**

Two related events:



Result after repetition:



# Learning



(a) Response: balancing a ball



(b) Consequence: receiving food



(c) Behavior strengthened

Operant conditioning is learning to associate a response and its consequences. Allowing one to repeat behaviors they associate with good results and not repeating behaviors that seem to provide poor results.



# Learning

**Observational  
learning-  
learning  
through  
observations.**

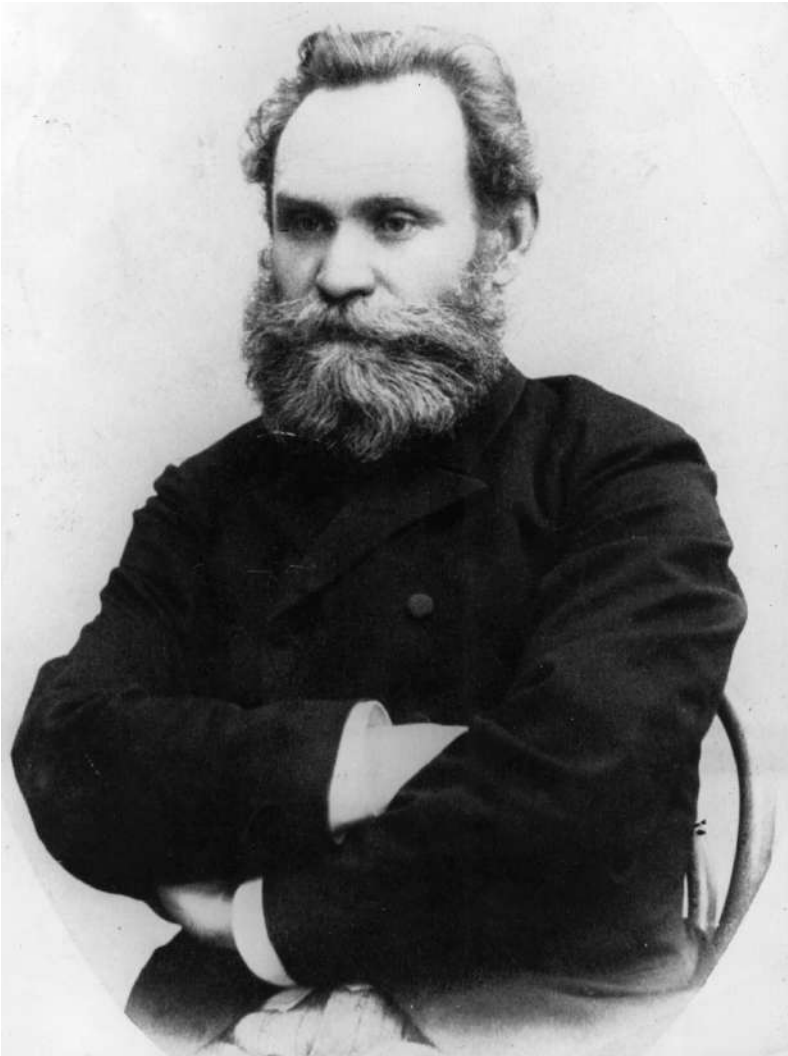


# Learning



Behaviorism ,  
developed by  
Behaviorist  
John  
Watson,  
is the view that  
psychology should  
be an objective  
science. Only  
looking at  
observable  
behavior.

# Classical Conditioning

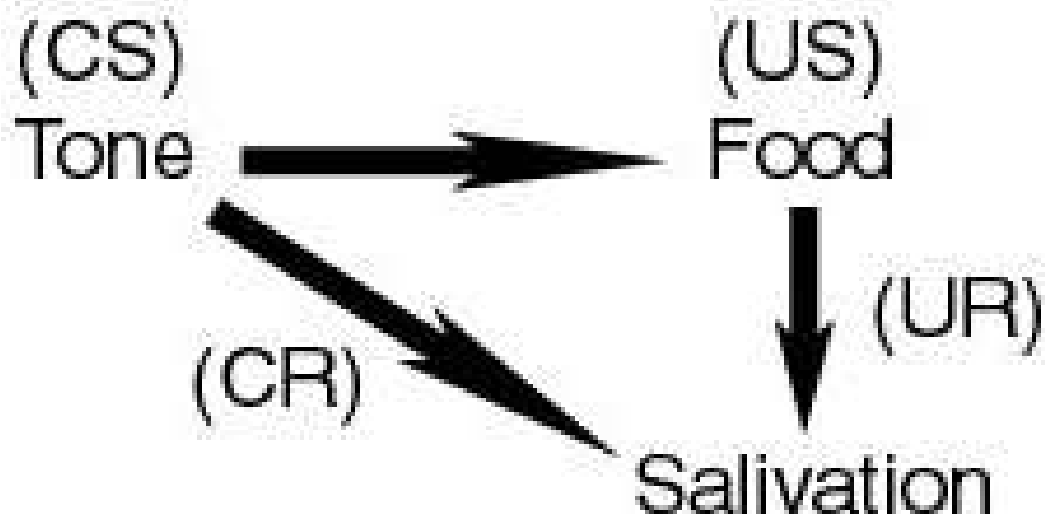
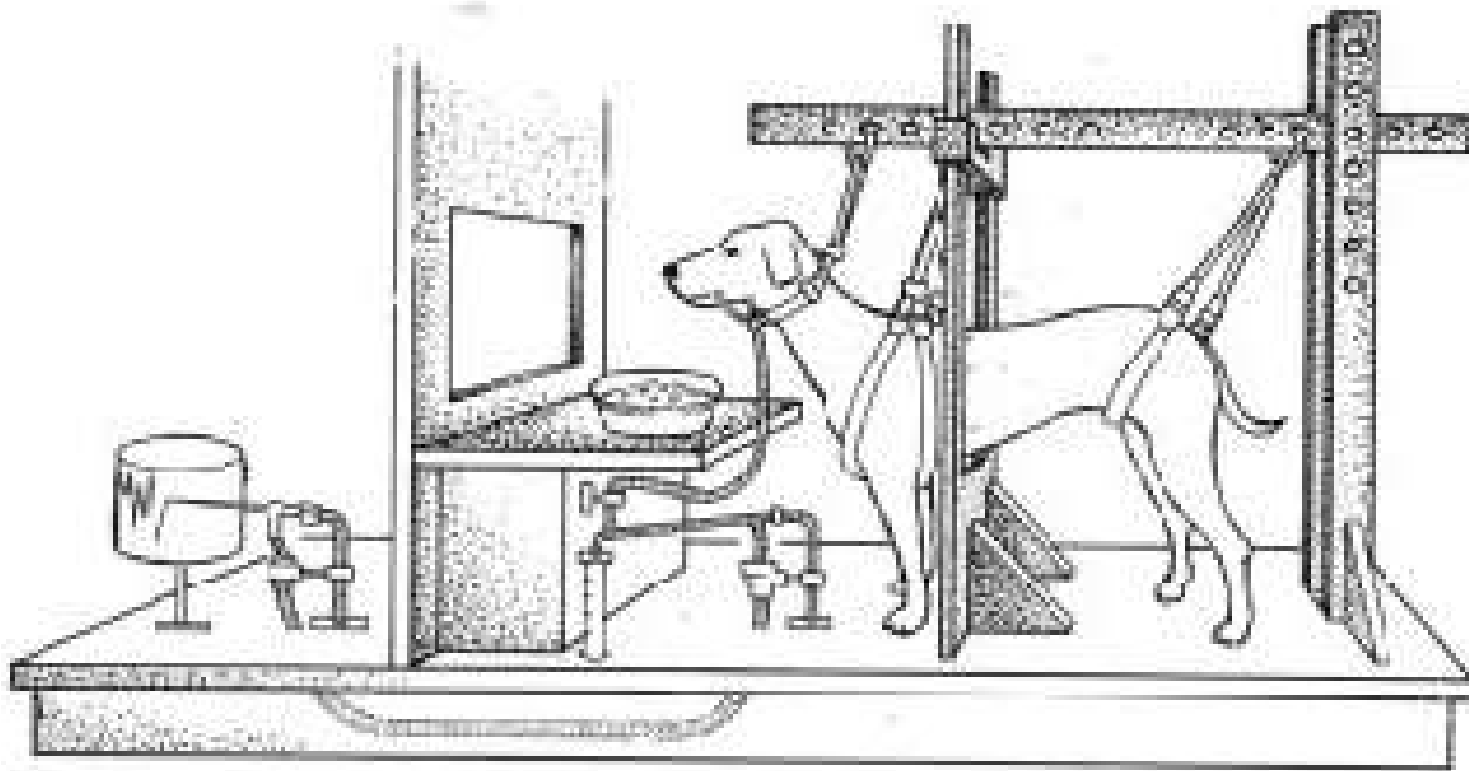


Ivan Pavlov may be known as the father of classical conditioning.

**Classical  
Conditioning**









**VIDEO TOOL KIT  
FOR INTRODUCTORY PSYCHOLOGY**

**Pavlov's Discovery  
of Classical Conditioning**

**Length: 3:08**

**Source: DBC Motion Gallery**

# Classical Conditioning



Unconditioned Response (UCR) – The normal response that is generated (unlearned) i.e. In Pavlov's experiment, the normal response a dog has when presented with food is salivation.



# Classical Conditioning

Unconditioned Stimulus (UCS) –  
The stimulus that triggers a normal response (UCR) i.e. The food is the UCS in Pavlov's experiment.



# Classical Conditioning

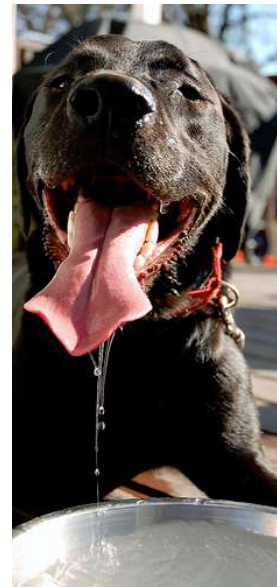


Conditioned Response (CR) – The response that is learned (“conditioned”) i.e. Pavlov’s dogs learned to salivate upon the presence of a ringing tone.

# Classical Conditioning

## Conditioned Stimulus

**(CS) - A neutral stimulus that triggers a learned response. i.e. The ringing is a CS because the dogs learned to salivate at the presence of a ringing tone as opposed to food.**



# Classical Conditioning

**This kind of association is possible because Pavlov presented a ringing tone every time before food is given to the dog. Eventually, the dog learned to anticipate food at the sound of ringing, so they salivate.**

1. Before conditioning



Food



Salivation

2. Before conditioning

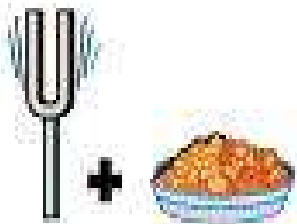


Tuning fork



No salivation

3. During conditioning

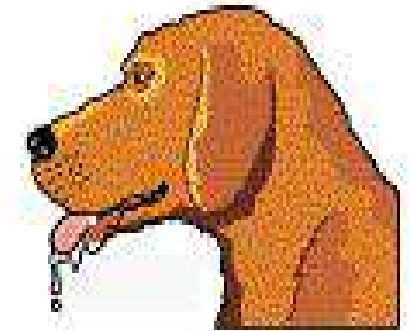


Salivation

4. After conditioning



Tuning fork



Salivation


# **Classical Conditioning**

**Pavlov's Classical Conditioning has led to a variety of practical uses like helping drug addicts, increasing the immune system efficiency, and treating emotional disorders.**


(passionate  
kiss)



(sexual  
arousal)



(onion  
breath)




(passionate  
kiss)



(sexual  
arousal)



(onion  
breath)



(sexual  
arousal)



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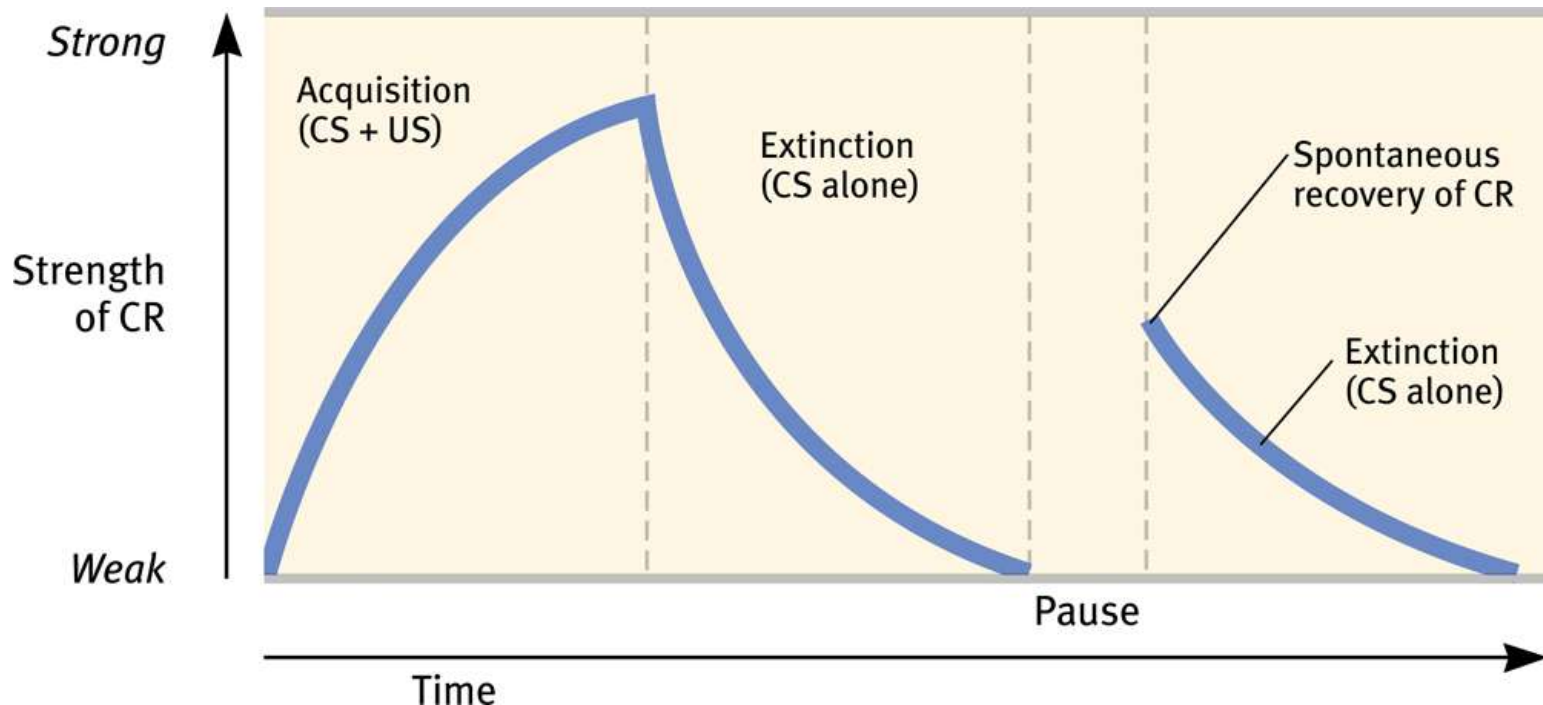
# Classical Conditioning

- Watson and Pavlov share the same view.
- There are 5 major processes with Classical Conditioning:
  - **Acquisition**
  - **Extinction**
  - **Spontaneous Recovery**
  - **Generalization**
  - **Discrimination**

# Classical Conditioning

## *Acquisition*

The initial formation of the association between CS and CR. This works well when the CS is presented half a second before UCS is presented. This finding supports the view that classical conditioning is biologically adaptive.



# Classical Conditioning

- Higher Order Conditioning - when the condition stimulus in one condition experience is paired with a new neutral stimulus creating a second (often weaker) condition stimulus
- Book Example: An animal that has learned that a tone predicts food might then learn that a light predicts the tone and begin responding to the light alone.

# Classical Conditioning *Extinction*

**The diminishing of a conditioned response that occurs when an unconditioned stimulus does not follow a conditioned stimulus. (can occur in operant conditioning when a response is no longer reinforced)**

**Like if after the ringing tone no food arrives, the dog stops to salivate at the presence of just a tone.**

# **Classical Conditioning**

## ***Spontaneous Recovery***

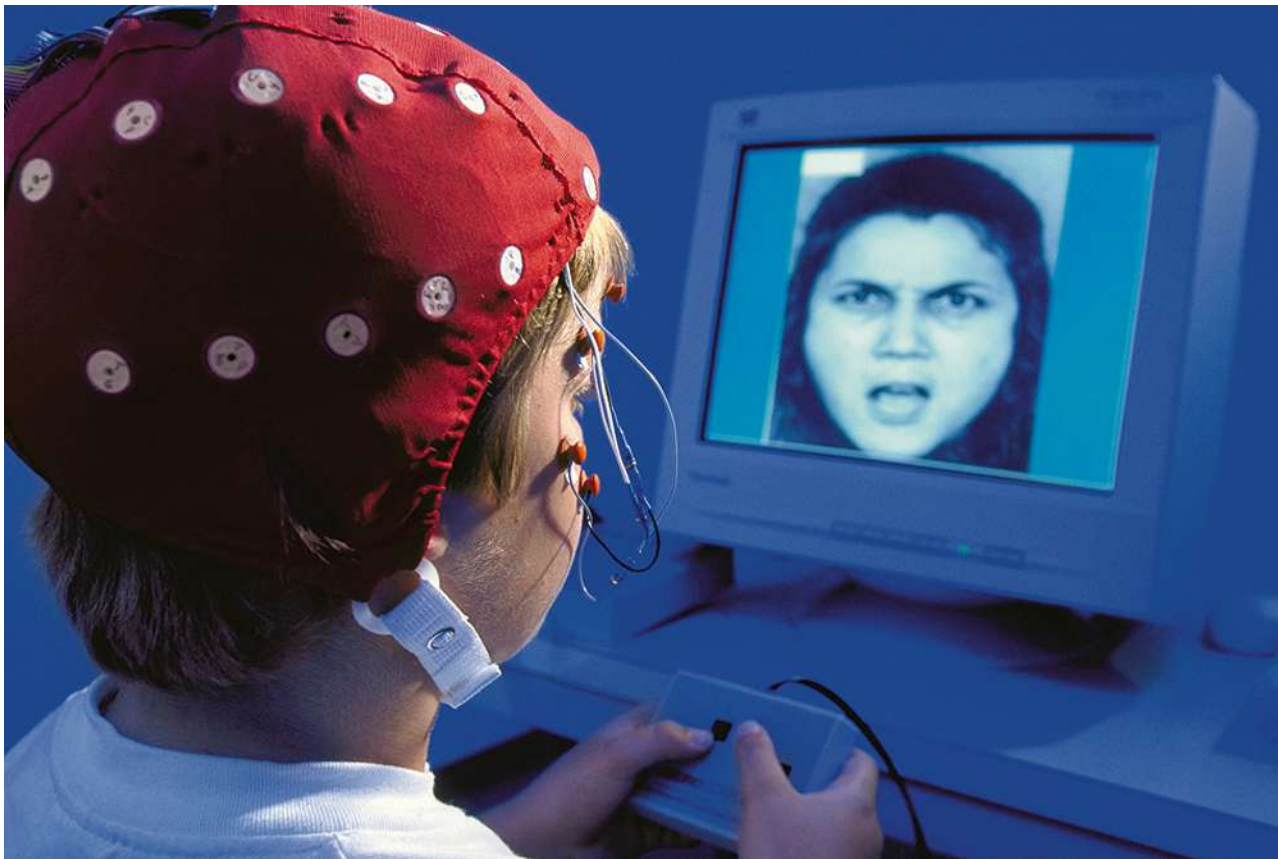
**the reappearance, after a pause, of an extinguished conditioned response.**

**Like when the food is again presented after ringing – dog salivates. Spontaneous recovery is the appearance of a formerly extinguished response, following a rest period.**

# Classical Conditioning *Generalization*

The tendency for organisms to respond similarly to similar (generalization) stimuli as the CS. i.e. Pavlov's dog salivating to the sound of beeping that is similar to ringing.

This is good because if you teach children to watch out for cars, they will also watch out for similar objects like trucks and vans.



**Child abuse leaves tracks in the brain. Reports that abused children's sensitized brains react more strongly to angry faces. This generalized anxiety response may help explain why child abuse puts children at greater risk of Psychological disorders.**



# Classical Conditioning *Discrimination*

**The ability to distinguish (discriminate) between different stimuli, so you don't react the same way to everything.**



- The Case of “Little Albert” – John B. Watson....



# Classical Conditioning

## Extending Pavlov's Understanding

- Cognitive Processes- (thoughts, perceptions, expectations)
- Animals can learn the predictability of an event.



# Classical Conditioning

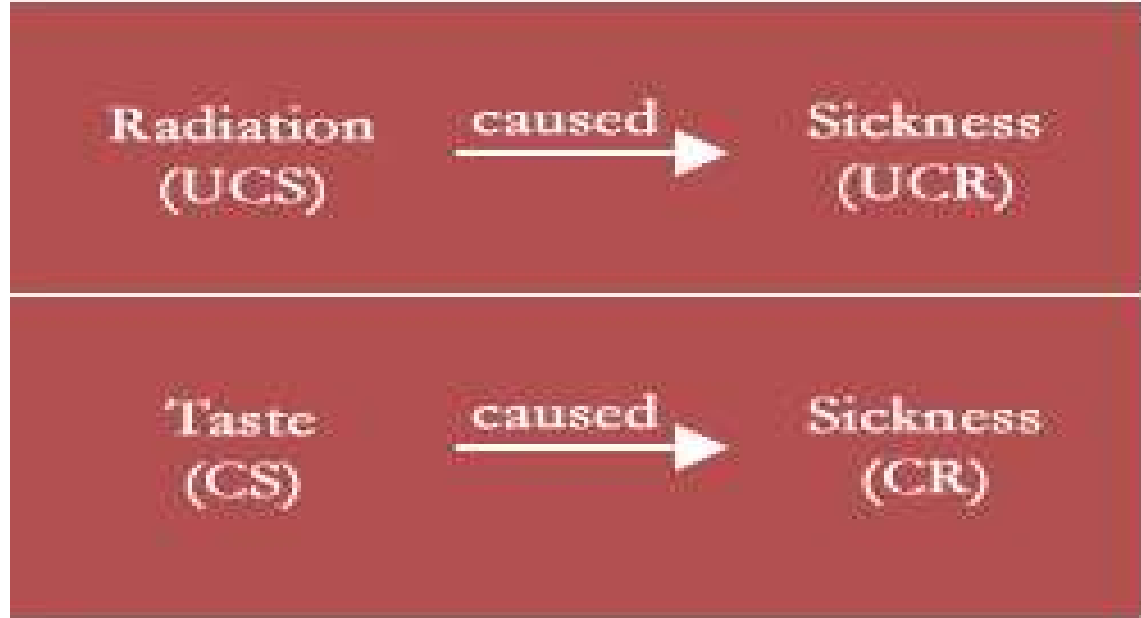
## Extending Pavlov's Understanding

- Cognitive Processes- (thoughts, perceptions, expectations)
  - Animals can learn the predictability of an event. (a strong conditioned response that is predicted – i.e. timing of more than one stimulus)
  - Awareness of how likely it is that the US will occur is called expectancy .

# Classical Conditioning

- Biological Predispositions-
  - An animal's capacity for conditioning is constrained by its biology.
  - Each species' predispositions prepare it to learn the associations that enhance its survival.
  - Learning enables animals to adapt to their environments.

- Garcia and Koelling (1966) showed that rats soon learned to avoid a sweet-tasting liquid when it was followed by an injection that made them ill, but they did not learn to avoid the liquid when they received electric shocks afterwards. Presumably this is connected with learning what foods they could safely eat. The rats did, however, learn to avoid the electric shock when it was paired with light and noise (but injection + light/noise failed). Maybe this is related to learning about natural hazards like lightning or falling objects.



**Garcia and Koelling (1966) while they were looking at the effects of radiation on rats. The rats became nauseated (UCR) from the radiation (UCS). Because the taste of water from a plastic bottle (CS) was inadvertently paired with the radiation, the rats developed a taste aversion (CR) for this water (CS). Subsequently, the rats drank more from the glass water bottle in their “home” cages (water that didn’t have the plastic taste). When the rats drank from the plastic bottle, the rats became nauseated.**

**The UCS is the radiation.**

**The UCR is becoming nauseated from the radiation.**

**The CS is the “plastic” taste of the water from the plastic water bottles.**

**The CR is becoming nauseated after drinking from the plastic water bottles.**

# Classical Conditioning

## *Pavlov's Legacy*

- Pavlov showed that many other responses to many other stimuli can be classically conditioned in many other organisms.
- Pavlov showed us how a process such as learning can be studied objectively.
- He also demonstrated that principles of learning apply across species.
- Classical conditioning is one way that virtually all organisms learn to adapt to their environment.





**In a series of experiments that controlled for other factors, (such as the Brightness of the image), men (but not women) found women more attractive and sexually desirable when framed in red.**



### **Biological influences:**

- genetic predispositions
- unconditioned responses
- adaptive responses

### **Psychological influences:**

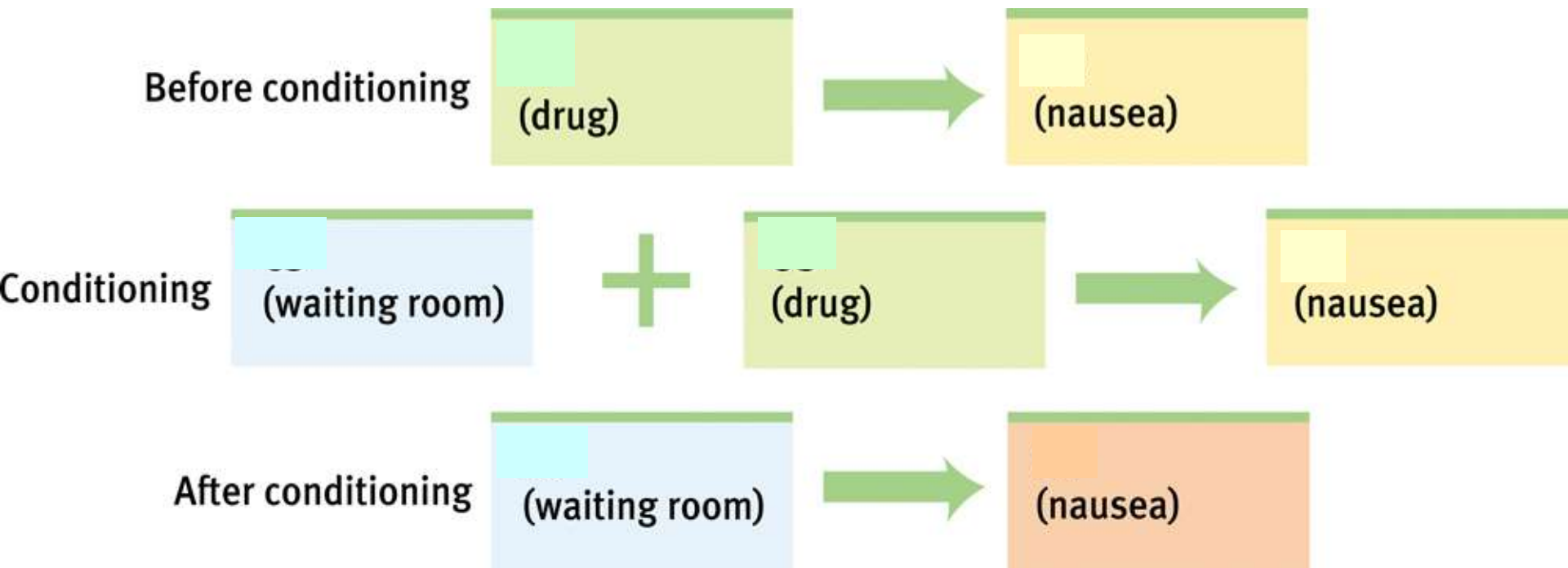
- previous experiences
- predictability of associations
- generalization
- discrimination

**Learning**



### **Social-cultural influences:**

- culturally learned preferences
- motivation, affected by presence of others



**Nausea condition in cancer patients.**

# Classical Conditioning

## *Applications of Classical Conditioning*

The following areas in psychology are directly applied to classical conditioning:

- Consciousness
- Motivation
- Emotion
- Health
- Psychological Disorders
- Therapy

# Operant Conditioning

# Operant Conditioning

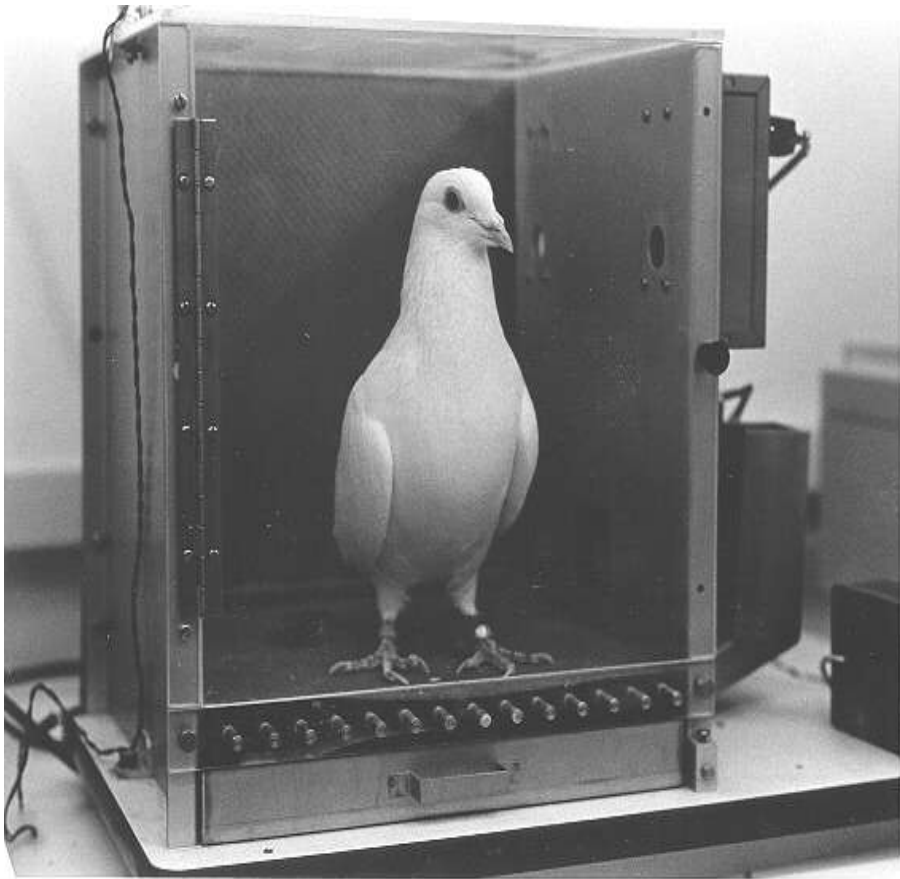
- The learned behavior that acts upon the situation and this behavior produces consequences.
- Ex: if you learned that eating on the bed makes your parents mad at you, your eating behavior will change depending on what kind of responses you want the situation to have.
- Respondent behavior is a behavior that occurs as an automatic response to some stimulus
- Operant behavior is behavior that operates on the environment, producing consequences.

# Operant Conditioning/Skinner

- Skinner's Experiments
- Law of Effect – Behavior that is rewarded is more likely to occur again.
- Skinner Box – The box Skinner used to research on animal behavior. The box has a bar/button that the animal can push to obtain rewards (food). The rate of pushing is recorded.



# B.F. Skinner



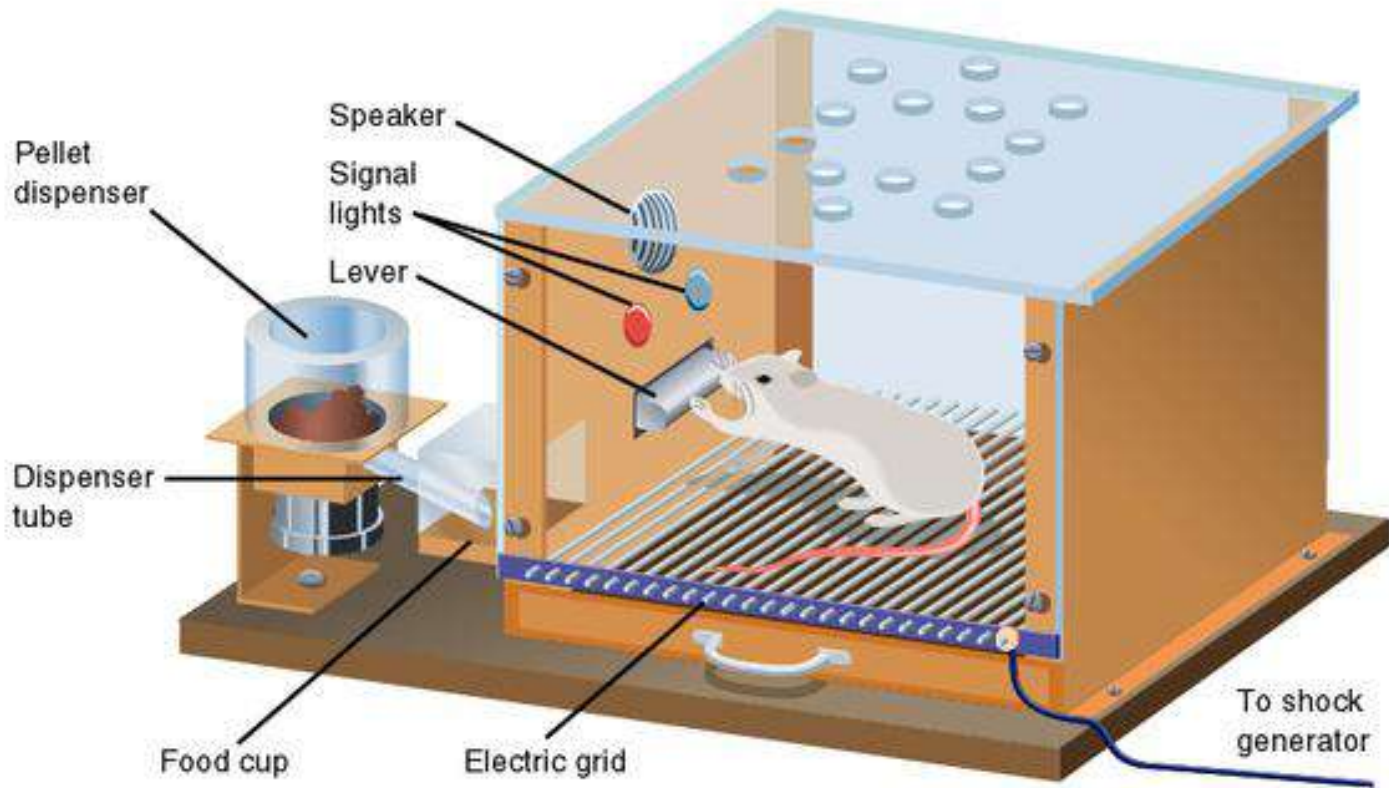
**Purposed using pigeons to direct bombs in WWII. They could do this, he purposed, with some pecking training.**

# Operant Chamber/Skinner Box



- **Way that B.F. Skinner studied operant behavior.**
- **The organism learns to do something because of its effects or consequences**

# Operant Chamber/Skinner Box



# Skinner Box

- Rat, deprived of food
- Lever that, when pressed, released some food pellets into the box.
- Rat, at first, pressed lever by accident
- Rat learned what the lever meant, and pressed the lever for the food.
- Skinner's Operant Conditioning has many useful applications like increasing student performance, influencing productivity in jobs, and helping shape children behaviors

# Reinforcement



- The rat's lever pushing was reinforced with the food pellets.
- The stimulus was the food, increased the chances that the preceding behavior, the lever pushing will occur again.

# Criticism of Skinner

Many psychologists criticized Skinner for underestimating the importance of cognition and biological constraints on learning.



# Types of Reinforcers

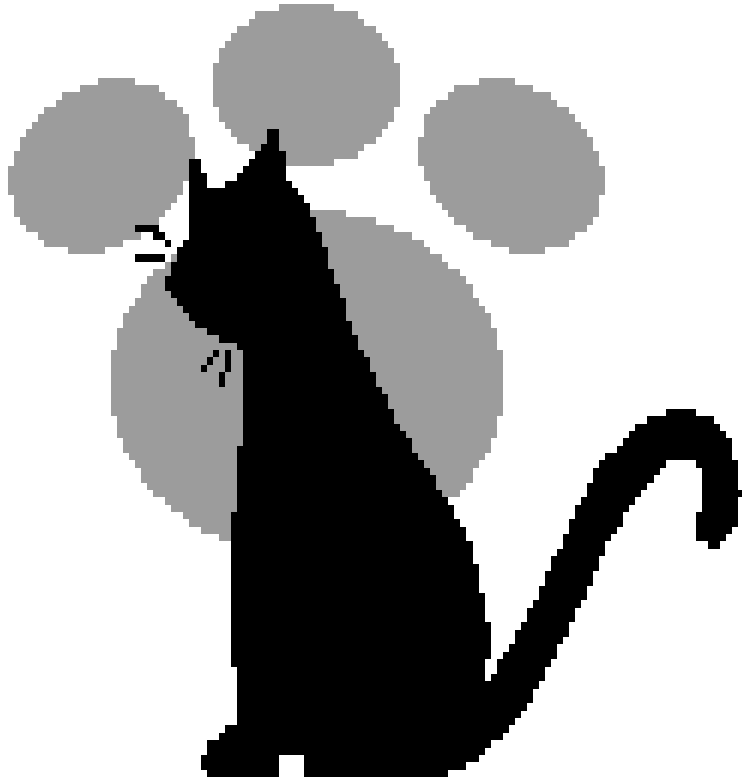
- A stimulus that encourages a behavior to occur again is called a reinforcer
- There are two types of reinforcers:
  - **Primary**- which are the stimulus that are biological to organisms. Such as Food, Water. Primary reinforcers are innately stabilized , there is no learning required.
  - **Secondary/Conditioned**- must be learned. Such as Money, attention, and social approval.

# Positive and Negative Reinforcers

- Positive- increase the frequency of the behavior they follow when they are applied
- Examples: Food, fun activities, and social approval
- In positive reinforcement, a behavior is reinforced because a person received something he or she wants following the behavior.



# Positive and Negative Reinforcers

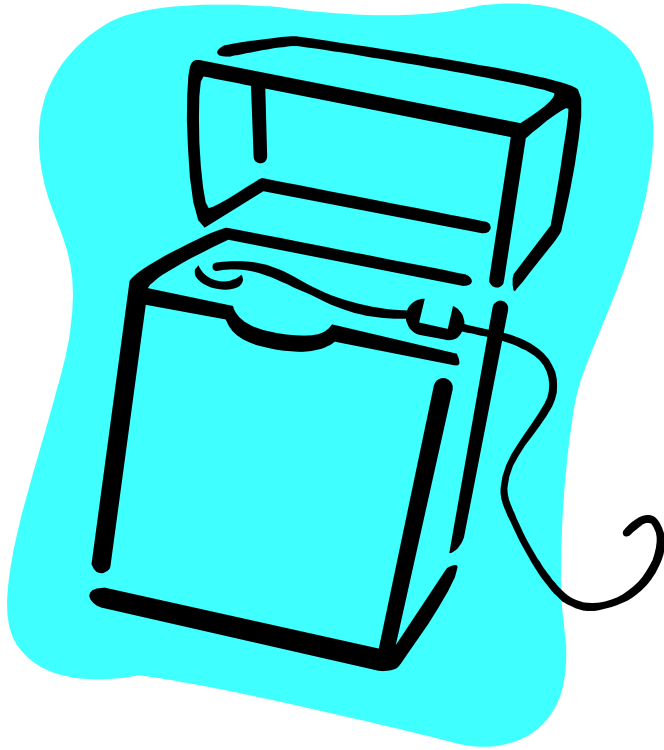


- Different reinforcers work for different people or organisms
- A banana may make a monkey happy, but it will not make a cat happy. (usually)

# Positive and Negative Reinforcers

- Negative- increase the frequency of the behavior they follow when they are removed
- Examples: Discomfort, fear, and social disapproval
- Negative reinforcement, behavior is reinforced because something unwanted *stops* happening or is removed following the behavior.

# Positive and Negative Reinforcers



- Again, different reinforcers work as negative reinforcers
- For example, if you have something caught in your tooth (Negative reinforcer), you remove that discomfort by flossing. You learn to floss more often.

# Punishments

- Similar to negative reinforcement only in that both are usually unpleasant.
- Different than negative reinforcements in that negative reinforcements increase the behavior, while punishments decrease the behavior they follow when they are applied

# Positive Punishment

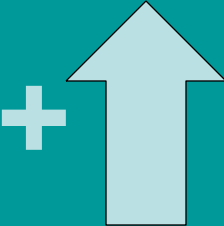
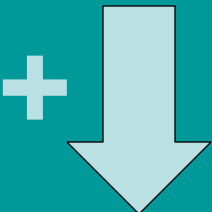

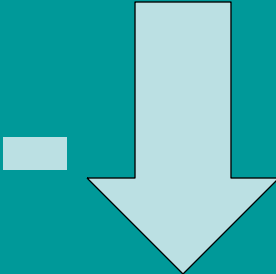
- Something bad can start or be presented, so behavior decreases
- Ex. If you stroke a cat's fur in a manner that the cat finds unpleasant, the cat may attempt to bite you. Therefore, the presentation of the cat's bite will act as a positive punisher and decrease the likelihood that you will stroke the cat in that same manner in the future.

# Negative Punishment

- Good can end or be taken away, so behavior decreases
- When a child "talks back" to his/her mother, the child may lose the privilege of watching her favorite television program. Therefore, the loss of viewing privileges will act as a negative punisher and decrease the likelihood of the child talking back in the future.

# Drawbacks to Punishment

- Punished behaviors are not forgotten, just suppressed until appropriate situations; punishment increases aggressiveness and attributes them to the punisher.
- Punishment's undesirable side effects may include suppressing rather than changing unwanted behaviors, teaching aggression, creating fear, and encouraging discrimination

	<u>Reinforcement</u> (behavior increases)	<u>Punishment</u> (behavior decreases)
<u>Positive</u> (something added)	<b>Positive Reinforcement:</b> something added increases behavior  	<b>Positive Punishment:</b> Something added decreases behavior  
<u>Negative</u> (something removed)	<b>Negative Reinforcement:</b> Something removed increases behavior  	<b>Negative Punishment:</b> Something removed decreases behavior  



# Schedules of Reinforcement

- **Partial reinforcement is reinforcing a response only part of the time; results in slower acquisition of a response but much greater resistance to extinction than does continuous reinforcement.**
- **In continuous reinforcement ,learning is rapid, but so is extinction if rewards cease. Continuous reinforcement is preferable until a behavior is learned.**

# Interval Schedules

- **Interval** is always dealing with **time**
- Fixed interval is a fixed amount of time. Like every five minutes.
- Variable interval schedules- varying amounts of time go by between reinforcements. Like a teacher that gives pop quizzes.
- Which would you be more likely to study for on a constant schedule? A teacher that gives out planned dates on quizzes or pop quizzes?

- ***Fixed-ratio schedules*** reinforce behavior after a set number of responses.
- ***Variable-ratio schedules*** provide reinforcers after an unpredictable number of responses.
- ***Fixed-interval schedules*** reinforce the first response after a fixed time interval.
- ***Variable-interval schedules*** reinforce the first response after varying time intervals.

Reinforcement linked to number of responses produces a higher response rate than reinforcement linked to time.

Variable (unpredictable) schedules produce more consistent responding than fixed (predictable) schedules.

# Ratio Schedules

- Fixed Ratio Schedule- reinforcement is provided after a fixed number of correct responses have been made
  - Ex. Every fifth video free
- Variable Ratio Schedule- reinforcement is provided after a variable number of correct responses have been made.
  - Ex. Slot machines

# Shaping

- Way of teaching complex behaviors in which one first reinforces small steps in the right direction
- a procedure in which *reinforcers*, such as food, guide an animal's natural behavior toward a desired behavior. By rewarding responses that are ever closer to the final desired behavior (*successive approximations*), and ignoring all other responses, researchers can gradually shape complex behaviors.
- Ex. Riding a bicycle

# Cognition and Operant Conditioning

- **Cognitive Map** – Mental images of ones surroundings. Like how mice develop cognitive maps that represent a maze they just ran through.
- **Latent Learning** – Demonstration of acquired knowledge only when it is needed. I.e.. Mice who explored amaze only demonstrate that they know the maze well by directly going to the food placed the previous time.
- An external reward's ability to undermine our interest and pleasure in an activity weakens the idea that behaviors that are rewarded will increase in frequency.

# Extrinsic and Intrinsic Motivation

- ***Intrinsic motivation***—the desire to perform a behavior effectively and for its own sake—rewards can carry hidden costs.
- ***Extrinsic motivation*** is the desire to perform a behavior to receive external rewards or avoid threatened punishment.

# Applications of Classical Conditioning

- Through classical conditioning, an organism associates different stimuli that it does not control and responds automatically.
- Through operant conditioning, an organism associates its operant behavior—those that act on its environment to produce rewarding or punishing the stimuli with their consequences.



# Learning by Observation

- Mirror neurons: frontal lobe neurons that fire when performing certain actions or when observing another doing so.
- The brain's mirroring of another's action may enable imitation, language learning and empathy. PET scans reveal that humans, too, have mirror neurons in this brain area, which also serves language.

# Learning by Observation

- Human mirror neurons help children learn by observation how to mimic lip and tongue movements when forming new words.
- Mirror neurons also help give rise to children's empathy and to their ability to infer another's mental state.
- Observational learning was researched by Albert Bandura in the 1960's, this is a type of learning that is accomplished by Modeling - watching specific behaviors of others and imitating them.
- **Prosocial Behavior** is when the actions that are constructive, beneficial, and nonviolent. These behaviors can prompt similar ones in others. Thus, "Pro-social".