

Learning

Consists of changes in behavior as a result of experience

Types of Learning

- Habituation
- Sensitization
- Social Learning, (also called Modeling or Imitation)
- Classical Conditioning
- Instrumental Conditioning
- Operant Conditioning

Habituation

A decrease in some response due to repeated exposures to a stimulus.

- e.g., Walk into a room with a bad odor (Sulfur). At first you grimace and attempt to avoid the smell.
- Once you habituate, it doesn't smell as strongly as it did at first.

Sensitization

An increase in some response due to repeated exposures to a stimulus

e.g., Walk through the woods. At first you are alert to the noise (sensitized), then you habituate.

Then a twig snaps – You immediately become alert and responsive again.

Signals may be potential dangers

Social Learning Imitation or Modeling

With Social Learning, organisms learn through imitation based on the observation of others.

e.g., Kids will learn a new response by watching others.

Bandura and Walters
Kid watches an adult behave aggressively towards a Bobo doll.

Or sit quietly and ignore the doll

After the adult leaves, What does the kid do?

**If the adult was aggressive,
the kid is aggressive.**

**If the adult sat quietly, the
kid sits quietly.**

Social Learning Depends on Several Factors

If the Model is Reinforced or Punished

**If the model is rewarded,
the observer will probably do the
behavior.**

- **If the model is punished,
the observer will probably not do the
behavior.**

Characteristics of the Model

Age of the model

Sex of the model

**If the model is seen as strong or
weak**

People imitate models that appear powerful

Way the Model is Presented

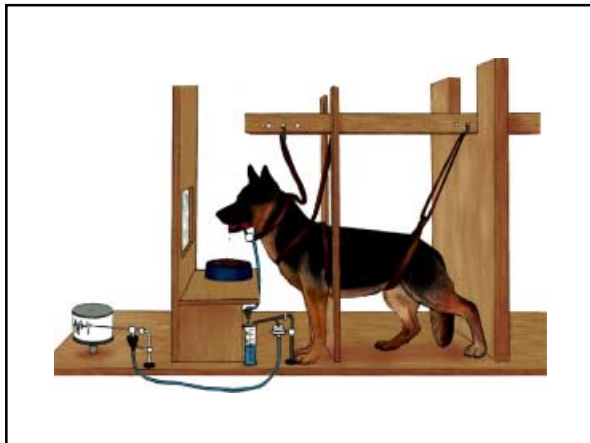
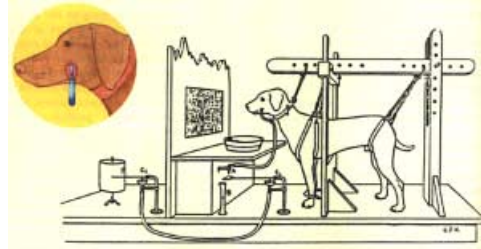
TV = Real life

Classical Conditioning (CC)

- **Is considered discovered by Pavlov**

Pavlov

- Was a Russian Physiologist.
- Before working on CC he already had won a Nobel prize for his work on digestion.
- Primarily worked with dogs.
- Would surgically make a hole in the dog's stomach and monitor digestive fluids.



Design

Put food in the dog's mouth and monitor the amount of salivation and digestive juices.

Ran into a problem.

Dogs began to salivate when it saw Pavlov and before food was placed in the mouth.

Had to figure out what was going on before going back to work on digestion.

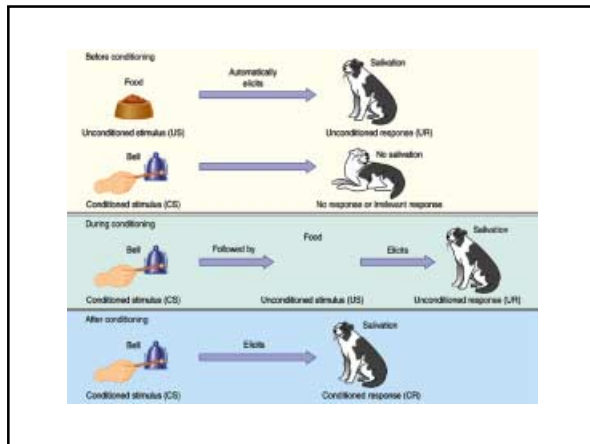
Results

- If you take an arbitrary stimulus (one that does not evoke an innate or automatic response, e.g., A BELL) and pair it with a non-arbitrary stimulus, (one that causes an automatic response e.g., FOOD), the pairing will evoke a response to the arbitrary stimulus that the organism has not made before.

Pavlov gave the arbitrary and non-arbitrary stimuli names.

Called the arbitrary stimulus the Conditioned Stimulus

Called the non-arbitrary stimulus the Unconditioned Stimulus.



Examples

• UCS		UCR
• Food		Salivation
• CS	UCS	UCR
Bell	Food	Salivation
• CS		CR
Bell		Salivation

	Air puff	Blink
Tone	Airpuff	Blink
Tone		Blink

	Spanking	Pain
Parent	Spanking	Pain
Parent		Pain

Emitine	Nausea/Vomiting	
Alcohol	Emitine	N/V
Alcohol	Nausea/Vomiting	

Discipline Pain/Embarr.
Teacher Disc. Pain/Embarr.
Teacher Pain/embarr.

I don't like school or my teacher anymore.

I don't like to study, etc.

Points to Note

1. CS must precede the UCS

When UCS precedes the CS is called backward conditioning – doesn't work well.

2. CR does not equal the UCR

Pavlov found the CR was not always the same as UCR.

Dogs salivate but the content is not the same.

Is general across organisms.

Dogs, rats, human fetuses, neurons

Can Appear in Many Environments.

Is a S - S paradigm

Related Classical Conditioning Concepts

Extinction

Is a decrease in a conditioned response due to repeated exposures

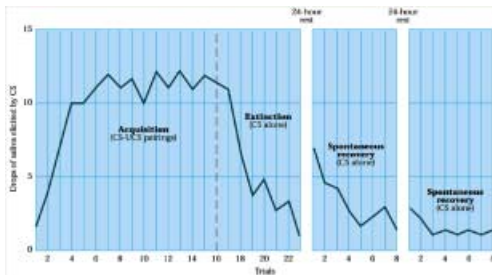
Occurs when the UCS is not present.

Spontaneous Recovery

After extinction has occurred, give a rest period, then present the CS again.

Again, you get a CR but it is lower than the original CR.

Can do several times



Total Extinction

When you present the CS after spontaneous recovery, but you get no CR

Generalization

When a response is acquired to a CS, other CS's will also evoke the same conditioned response.

In addition, the closer the new stimulus is to the original conditioned stimulus, the higher the probability is that the response will occur.

Example

Original CS

Uses a red light

Orange red light

Yellow Red light

Yellow light

Get CR

Same CR

Less CR

No CR

Watson and Little Albert

Discrimination

Here the organism differentiates or discriminates between the original stimulus and the new stimulus.

- The organism is presented with the original CS and a new CS
- The organism responds to the original CS and not to the new CS.

Higher Order Conditioning

- Also called secondary conditioning

	Discipline	Pain/Fear
Teacher	Discipline	Pain/Fear
Teacher		Pain/Fear

Things associated with the teacher		
Classroom	Teacher	Pain/Fear
Classroom		Pain/Fear

Result: Kid doesn't want to be in the classroom

Solution

- Use extinction
- Teacher No pain
- For teachers to decrease emotional reactions caused by negative stimuli, e.g., loud bells, noise associated with fire drills.
- Tell students what will occur.

Schedules of Conditioning

Simultaneous Conditioning

- Both CS and UCS occur and stop at the same time.
- Produces minimal conditioning. Often used as a control conditioning.

Delayed

- CS is presented before UCS.
- Then CS is stopped.
- Finally the UCS is stopped.

Trace

- CS occurs prior to the UCS but stops before the UCS is presented.
- The longer the delay between the CS and UCS, the poorer the conditioning.

Backward

- Here the UCS is presented before the CS.
- Both stop at the same time.

Temporal

- UCS is presented alone at discrete time intervals (e.g, 30 seconds). Eventually the time elapsed since the last stimulus present becomes a signal for the delivery of the UCS. Thus, time becomes a CS.
- Why many individuals have food related thoughts and behavior before lunch or dinner whether they are hungry or not.

Instrumental Conditioning

In CC, the relationship between the two stimuli before the response is important.

In Instrumental Conditioning the relationship between the stimulus and the response are important.

Thus, what the stimuli do is the focus of the process, and how the stimuli influence the response.

Called S – R Psychology

Operant Conditioning

In CC, the focus is on the two stimuli.

In Instrumental Conditioning, the focus is on the S and how it affects the response.

In Operant conditioning, what follows the response is the most important. That is, the consequent stimulus.

R – S

Thus, you have a Stimulus that causes a Response, which is in turn followed, by a consequent stimulus.

Thorndike

- Worked with cats in puzzle boxes. Cat pulls a string and can get out of the box.
- Developed the Law of Effect.
- If a response is followed by a satisfying state of affairs, the response is most likely to be repeated.

Skinner

- While the law of effect was important, Skinner was the most influential in this area.

Systematically Demonstrated Several Things

If something occurs after the response (consequent stimulus) and the behavior increases,

The procedure is called reinforcement, and the thing that caused the increase is called a reinforcer.

If something occurs after the response (consequent stimulus) and the behavior decreases,

The procedure is called punishment,

and the thing that caused a decrease is called a punisher.

SO REINFORCERS ALWAYS INCREASE A BEHAVIOR

AND PUNISHERS ALWAYS DECREASE A BEHAVIOR.

THERE ARE NO EXCEPTIONS.

Two types of Reinforcers and Punishers.

There are two types

The difference occurs due to whether you add or remove something.

If you add something following a response = positive

If you remove something following a response = negative

- Positive does not mean good:
- Negative does not mean bad.

Positive Reinforcement

- If you add something (goodie) following a response and behavior increases, called Positive Reinforcement.

How to get the behavior to occur the first time

- Use shaping by successive approximations (shaping).
- In shaping you reinforce successive approximations to the desired response.
- Get a rat to bar press.

Reverse Shaping

Start at the end response, then reinforce it.

Then two steps before you reinforce it,

Then three steps, etc.

Examples

Stewart Little the Mouse.
Teaching a kid to tie their shoes.

Negative Reinforcement

- If you remove something following the response and the behavior increases, called Negative Reinforcement.

Two types of Negative Reinforcement

- Escape
- If you escape from something aversive, the next time you are in the same situation, you will make the same response.

Example Spousal abuse

Wife is yelling at her husband (aversive stimulus).

Husband hits wife.

Wife stops yelling.

Husband is negatively reinforced.

Next time the husband is in a similar situation, the husband will hit again.

Avoidance

To avoid something aversive, you will make the same response.

Example

Kid in candy store

Kid wants a candy bar, is obnoxious, yells, etc.

Parent is embarrassed and upset

Gives the kid the candy bar

Kid stops yelling

Parent is negatively reinforced (escape). No more yelling.

Next time, parent gives the kid a candy bar when they enter the store (avoidance)

NOTE:
The kid is positively reinforced for its behavior

Related Concepts

Discrimination

Responses which are reinforced in one situation and not in another will reoccur only in the situation where they were reinforced.

e.g., in a bar, loud talking may be reinforced, but in the classroom it isn't.

e.g., Kid is reinforced for yelling in the store, but when it is at home, other things may occur.

Generalization

New stimuli similar to the original stimulus are Reinforced

Occurs when the organism is reinforced for other responses similar to the original stimulus

Primary and Secondary Reinforcers

Primary Reinforcers are reinforcers that are innately reinforcing (e.g., food water, sex).

Secondary Reinforcers are reinforcers that acquire their ability to reinforce through experience (e.g., Money)

- Secondary reinforcers become reinforcing when they can be exchanged for primary reinforcers. e.g., money for food

Positive Punishment

When a response is followed by a stimulus and the behavior decreases, the procedure is called positive punishment and the stimulus is called a punisher

e.g., response is followed by a Zap

Difference between Positive Punishment and Negative Reinforcement.

In Positive Punishment, the response is followed by something aversive and the behavior decreases.

In Negative Reinforcement, the response is followed by the removal of an aversive stimulus and the behavior increases.

Negative Punishment

- Two types

Response Cost (RC)

In response cost the response is followed by the removal of a goodie and the behavior decreases.

Is not like positive punishment where you give something aversive and the behavior decreases.

Kid yells in the house and parents take away TV time.

Time Out

(From Positive Reinforcement)

- In Time Out, the response is followed by the removal of the reinforcing stimulus and the behavior decreases in frequency.
- Generally, the organism is placed in a neutral situation where no reinforcers or stimuli are available.
- e.g., Kid yells in the house and parents place the kid in the corner.

Problem

The neutral situation may have reinforcers. Must make sure there are no reinforcers available.

- e.g., Kid yells
- Parent says go to your room
- What's in the room - TOYS
- Alternative sit on your bed quietly
- Not many stimuli or things to do on the bed.

To Make Punishers Effective

Apply swiftly

Use enough intensity to be effective the first time.

Don't gradually increase

Be Consistent

Make alternative responses available for appropriate behavior.

Side Effects of Punishment

- May be a general decrease in all behavior
- Kids who are punished may not talk as much – can become withdrawn.
- May cause emotional outbursts.
Yelling, acting out, fear
- May generate hostility toward the source or the person giving the punisher.
- Physical punishment is highly correlated with aggressive behavior in kids.
- Lots of physical punishment increases aggression in kids.

Schedules of Operant Conditioning

- Two types
 1. Ratio Based on number of Response
 2. Interval Based on time

Ratio Schedules

- Depends on the number of responses that occur before a reinforcer is given.
- Two types

Fixed Ratio (FR)

A reinforcer is given after a fixed number of responses have been emitted

5 widgets get \$10
5 widgets get another \$10
5 widgets get \$10

What schedule you are on = number of responses that are required before a reinforcer is given.

5 widgets per reinforcer = FR-5 schedule

Variable Ratio (VR)

- A reinforcer is given after a variable number of responses have occurred and the number required changes every time.
- 2 widgets get \$10
- 8 widgets get \$10
- 6 widgets get \$10
- 4 widgets get \$10

The schedule you are on =
the number of responses divided by
the number of reinforcers given

e.g.,
20 widgets / 4 reinforcers = VR-5
schedule

Fixed Interval (FI)

A reinforcer is given for the first response that occurs after a fixed period of time has elapsed.

e.g. every 5 minutes a reinforcer becomes available.

If the organism responds in the interval, they get the reinforcer. If they do not respond, they don't get the reinforcer.

The number of responses emitted is irrelevant.

Variable Interval (VI)

- A reinforcer is given for the first response that occurs after a variable period of time has elapsed but the time period changes every time.

e.g., 3 minutes reinforcer is available

- 7 minutes reinforcer is available
- 2 minutes reinforcer is available
- 8 minutes reinforcer is available

Schedule = Number of minutes divided by the number of time intervals where a reinforcer is available.

20 minutes / 4 reinforcers = VR – 5 schedule