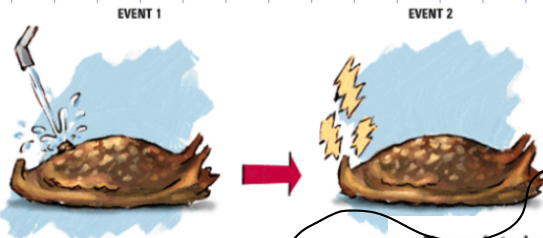


ASSOCIATIVE LEARNING: learning to associate one stimulus w/ another (classical conditioning)

UNIT 3 Learning

- learning to associate a response w/ a consequence (operant conditioning)

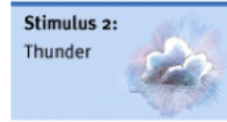


Sea snail associates splash with a tail shock

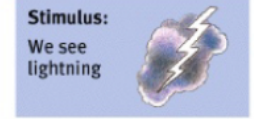
Two related events:



+



Result after repetition:



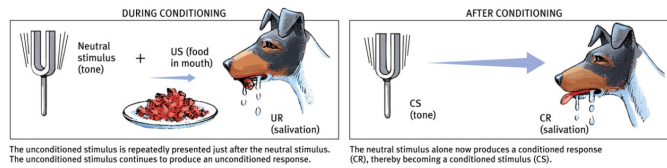
↓



classical conditioning

Ideas of classical conditioning originate from old philosophical theories. However, it was the Russian psychologist Ivan Pavlov who elucidated classical conditioning. His work provided a basis for later behaviorists like John Watson

- studied the digestion of dogs
- dogs would salivate before they were given food (triggered by sounds, lights, etc)
- dogs must have learned how to salivate
- Pavlov's Experiments:
 - during conditioning, the neutral stimulus (tone) and the US (food) are paired, resulting in salivation (UR). After conditioning, the neutral stimulus (now conditioned stimulus (CS)) elicits salivation (now conditioned response (CR))



The unconditioned stimulus is repeatedly presented just after the neutral stimulus. The unconditioned stimulus continues to produce an unconditioned response. The neutral stimulus alone now produces a conditioned response (CR), thereby becoming a conditioned stimulus (CS).

Acquisition

The conditioned stimulus (CS) needs to come half a second before the unconditioned stimulus (US) for acquisition to occur

- The initial learning stage in classical conditioning in which an association between a neutral stimulus & an unconditional stimulus takes place

acquisition does not last forever; the moment CS is no longer associated w/ US = extinction

- This is passive learning (automatic = learner does not have to think)
- First thing you need is a unconditional relationship
- Unconditional Stimulus = something that elicits a natural, reflexive response
- Unconditional Response = response to the US.
 - ↳ after a while the body begins to link together the neutral stimulus w/ the US
- the neutral stimulus ⇒ conditioned stimulus (CS)
- the unconditional response ⇒ conditioned response

Spontaneous Recovery

- Sometimes after extinction, the CR still randomly appears after CS is presented
- After a rest period, an extinguished CR (salivation) spontaneously recovers, but if the CS (tone) persists alone the CR becomes extinct again.

- delayed conditioning = present CS, while CS is still there, present UCS
- trace conditioning = present CS, short break, then present UCS
- Simultaneous conditioning = CS & UCS are presented at the same time
- Backward Conditioning = UCS is presented, then CS is presented

Stimulus generalization

- tendency to respond to stimuli similar to the CS
- Pavlov conditioned the dog's salivation (CR) by using miniature vibrators (CS) on the thigh. When he subsequently stimulated other parts of the dog's body, salivation dropped.
- something is so similar to the CS that you get CR

cognitive processes & biological predispositions

- Early behaviorists believed that learned behaviors of animals could be reduced to mindless mechanisms.
- Later behaviorists suggested that animals learn the predictability of a stimulus, meaning they learn expectancy or awareness of a stimulus (Rescorla & Wagner, 1972)
- Pavlov and Watson believed that laws of learning were similar for all animals. Therefore, a pigeon and a person do not differ in their learning. However, behaviorists later suggested that learning is constrained by an animal's biology

garcia and koelling experiment

- studied rats and how they make associations
- some associations seem to be adaptive

CS	UCS	Learned Response
loud noise	shock	fear
loud noise	radiation (nausea)	nothing
sweet water	shock	nothing
sweet water	radiation (nausea)	avoid water

Garcia showed us that the duration between the CS and the UCS may be long (hours), but yet result in conditioning. A biologically adaptive CS (taste) led to conditioning but other stimuli (sight or sound) did not.

↳ even humans can develop classically to conditioned nausea

Applications of Classical Conditioning

- 1.) Former crack cocaine users should avoid cues (people, places) associated w/ previous drug use.
- 2.) Through classical conditioning, a drug (plus its taste) that affects the immune response may cause the taste of the drug to invoke the immune response.

Classical Conditioning and Humans

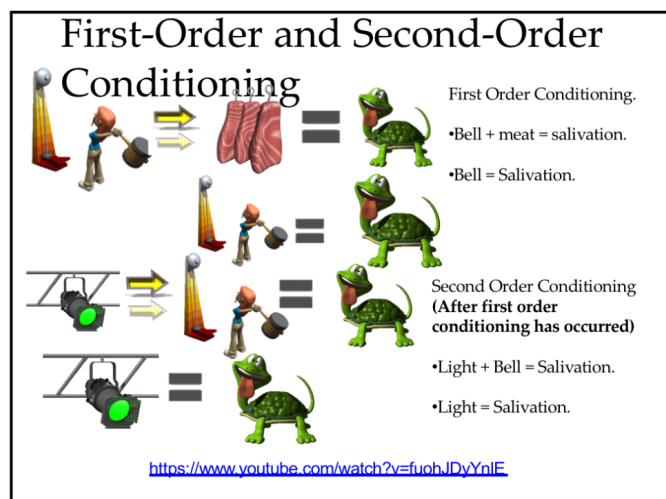
- John Watson brought classical conditioning to psychology w/ his Baby Albert experiment. This type of classical conditioning is also known as **aversive conditioning**.
- Watson used classical conditioning procedures to develop advertising campaigns for a number of organizations, including Maxwell House, making the "coffee break" an American custom.

Stimulus discrimination

- discrimination is the learned ability to distinguish between a conditioned stimulus & other stimuli that do not signal an unconditioned stimulus.
- something is so different to the CS so you do not get a CR

Pavlov and Watson considered consciousness, or mind, unfit for the scientific study of psychology. However, they underestimated the importance of cognitive processes and biological restraints.

pavlov's greatest contribution to psychology is isolating elementary behaviors from more complex ones through objective scientific procedures.



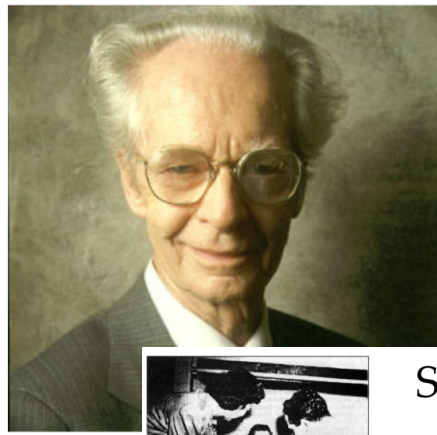
OPERANT CONDITIONING: the learning is based on consequence

the law of effect

- Edward Thorndike
- locked cats in a cage



- behavior changes b/c of its consequence
- rewards strengthen behavior
- If consequences are unpleasant, the Stimulus-Reward connection will weaken
- called the entire process instrumental learning



B.F. Skinner

- The Mac Daddy of Operant Conditioning
- Believed in nurture in the nature vs. nurture debate
- Used a Skinner Box to prove his concepts
 - ↳ a chamber used to study animal behavior; carefully designed to emit a # of consequences from the behaviors of the animals contained

Reinforcers

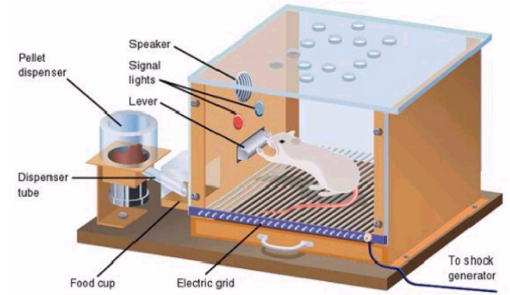
- A reinforcer is anything that increases a behavior
- positive reinforcement = the addition of something pleasant
- negative reinforcement = the removal of something unpleasant
 - ↳ 2 types of NR:
 - escape learning
 - avoidance learning (getting kicked out of class vs. cutting class)

Punishment

- means to decrease a behavior
- positive punishment = addition of something unpleasant
- negative punishment (omission training) = removal of something pleasant
- punishment works best when it is immediately done after behavior and if it is harsh
- an aversive event that decreases the behavior it follows



Skinner Box



WAYS TO DECREASE BEHAVIOR

Type of Punisher	Description	Possible Examples
Positive punishment	Administer an aversive stimulus	Spanking; a parking ticket
Negative punishment	Withdraw a desirable stimulus	Time-out from privileges (such as time with friends); revoked driver's license

Positive or Negative?

- Putting your seatbelt on. (negative reinforcement)
- Studying for a test, both; avoiding a bad grade and/or getting a good grade. (negative reinforcement)
- Having a headache and taking an aspirin. (negative reinforcement)
- Faking sick to avoid Honors Psych class. (negative reinforcement (avoidance learning))
- Breaking out of jail. (negative reinforcement (escape learning))
- Getting a kiss for doing the dishes. (positive reinforcement)

- Although there may be some justification for occasional punishment (Larzelere & Baumrind 2002), it usually leads to negative effects

- 1.) results in unwanted fears
- 2.) conveys no info to the organism
- 3.) justifies pain to others
- 4.) causes unwanted behaviors to reappear in its absence
- 5.) causes aggression toward the agent
- 6.) causes one unwanted behavior to appear in place of another

- Chaining behaviors = subjects are taught a number of responses successively in order to get a reward

• Primary vs. Secondary Reinforcers

- Primary reinforcers: things that are rewarding w/in themselves

- Secondary reinforcers: things we have learned to value

↳ [ex] money is a special secondary reinforcer called a **generalized reinforcer** b/c it can be traded for just about anything

How do we actually use Operant Conditioning?

Do we wait for the subject to deliver the desired behavior?

Sometimes, we use a process called **shaping**.

Shaping is reinforcing small steps on the way to the desired behavior.



To get Barry to become a better student, you need to do more than give him a massage when he gets good grades. You have to give him massages when he studies for ten minutes, or for when he completes his homework. Small steps to get to the desired behavior.

• Token Economy

- every time a desired behavior is performed, a token is given
- they can trade tokens in for a variety of prizes (reinforcers)
- used in homes, prisons, mental institutions and schools

• Premack Principle

- you have to take into consideration the reinforcers used
- is the reinforcer wanted... or at least is it more preferable than the targeted behavior

• Reinforcement Schedules

How often do you give the reinforcer?
Every time or just sometimes you see the behavior

• Continuous vs. Partial Reinforcement

- | | |
|--|---|
| <ul style="list-style-type: none"> □ reinforce the behavior EVERYTIME the behavior is exhibited □ usually done when the subject is first learning to make the association □ acquisition and extinction come really fast | <ul style="list-style-type: none"> □ reinforce the behavior only SOME of the times it is exhibited □ Acquisition comes more slowly □ But is more resistant to extinction □ 4 types of partial reinforcement Schedules |
|--|---|

• Ratio Schedules

- Fixed Ratio :
 - provides a reinforcement after a SET # of responses
- Variable Ratio :
 - provides a reinforcement after a RANDOM # of responses
 - very hard to get acquisition but also very resistant to extinction

Interval Schedules - Fixed vs. Variable

- Fixed = requires a SET amount of time to elapse before giving reinforcement
- Variable = requires a RANDOM amount of time to elapse ' '



TYPE	MEANING	OUTCOME
Fixed Ratio	Reinforcement depends on a definite number of responses	Activity slows after reinforcement and then picks up
Variable Ratio	Number of responses needed for reinforcement varies	Greatest activity of all schedules
Fixed Interval	Reinforcement depends on a fixed time	Activity increases as deadline nears
Variable Interval	Time between reinforcement varies	Steady activity results

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SCHEDULE	FORM OF REWARD	INFLUENCE ON PERFORMANCE	EFFECTS ON BEHAVIOR
Fixed interval	Reward on fixed time basis	Leads to average and irregular performance	Fast extinction of behavior
Fixed ratio	Reward tied to specific number of responses	Leads quickly to very high and stable performance	Moderately fast extinction of behavior
Variable interval	Reward given after varying periods of time	Leads to moderately high and stable performance	Slow extinction of behavior
Variable ratio	Reward given for some behaviors	Leads to very high performance	Very slow extinction of behavior

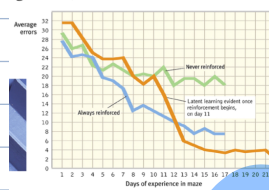
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cognition & operant conditioning

Evidence of cognitive processes during operant learning comes from rats during a maze exploration in which they navigate the maze with an obvious reward. Rats seem to develop cognitive maps, or mental representations, of the layout of the maze (environment)

• Latent Learning

- cognitive maps are based on this, which becomes apparent only when an incentive is given (Tolman & Honzik, 1930)
- Edward Tolman
- 3 rat experiment
- latent = hidden
- sometimes learning is not immediately evident



B.F Skinner believed

- rats needed a reason to display what they've learned

• Insight Learning

- Wolfgang Kohler + his chimpanzees

- Some animals learn through the 'ah ha' experience

intrinsic motivation vs. extrinsic motivation

The desire to perform a behavior for its own sake

The desire to perform a behavior due to promised rewards or threats of punishment

For example: reading because you enjoy it vs. reading because you have to write an essay on it for a good grade

In inner thought processes and biological underpinnings, but many psychologists criticize him for discounting them.

OBSERVATIONAL LEARNING (monkey see, monkey do)

→ higher animals, especially humans, learn through observing + imitating others

• Imitation Onset

▣ learning by observation begins early in life

• Albert Bandura + his Bobo doll

▣ we learn through modeling behavior from others

▣ observational learning + operant conditioning
= social learning theory

• Positive Observational Learning

▣ prosocial (positive, helpful) models may have prosocial effects

→ involves 4 separate processes:

* attention

* retention + rehearsal

* production

* motivation (reinforcement / punishment)

• Television & Observational Learning

▣ children in elementary school who are exposed to violent tv, videos, and video games express increased aggression

▣ research shows that viewing media violence leads to an increased expression of aggression (i.e. children modeling the moves of pro wrestlers)

bandura's experiments

Bandura's Bobo doll study (1961) indicated that individuals (children) learn through observing, retaining, and replicating the novel behavior executed by others who receive rewards and punishments. Also known as vicarious learning.

<http://www.youtube.com/watch?v=BA>

<https://www.youtube.com/watch?IEaefTcYI>

<v=MN6RKtGLbXU>