Learning

Classical Conditioning (stimuli)

Unconditioned Stimulus (UCS) = original stimulus that elicits an automatic response

Unconditioned Response (UCR) = unlearned response that occurs as a result of being exposed to the UCS

Neutral Stimulus (NS) = stimulus that has not been associated and will not affect the subject

Conditioned Stimulus (CS) = previously neutral stimulus that comes to elicit a response due to association with an UCS

Conditioned Response (CR) = learned response a NS (later CS) through association

Forms of Conditioning
- *Delayed Conditioning* = present NS/CS → introduce US (most effective)
- *Trace Conditioning* = present NS/CS → short break → introduce US (less effective)
- *Simultaneous Conditioning* = present NS/CS and US at the same time (less effective)
- *Backward Conditioning* = present US → present NS/CS (very ineffective)
- *Aversive Conditioning* = noxious stimuli associated with undesirable behavior

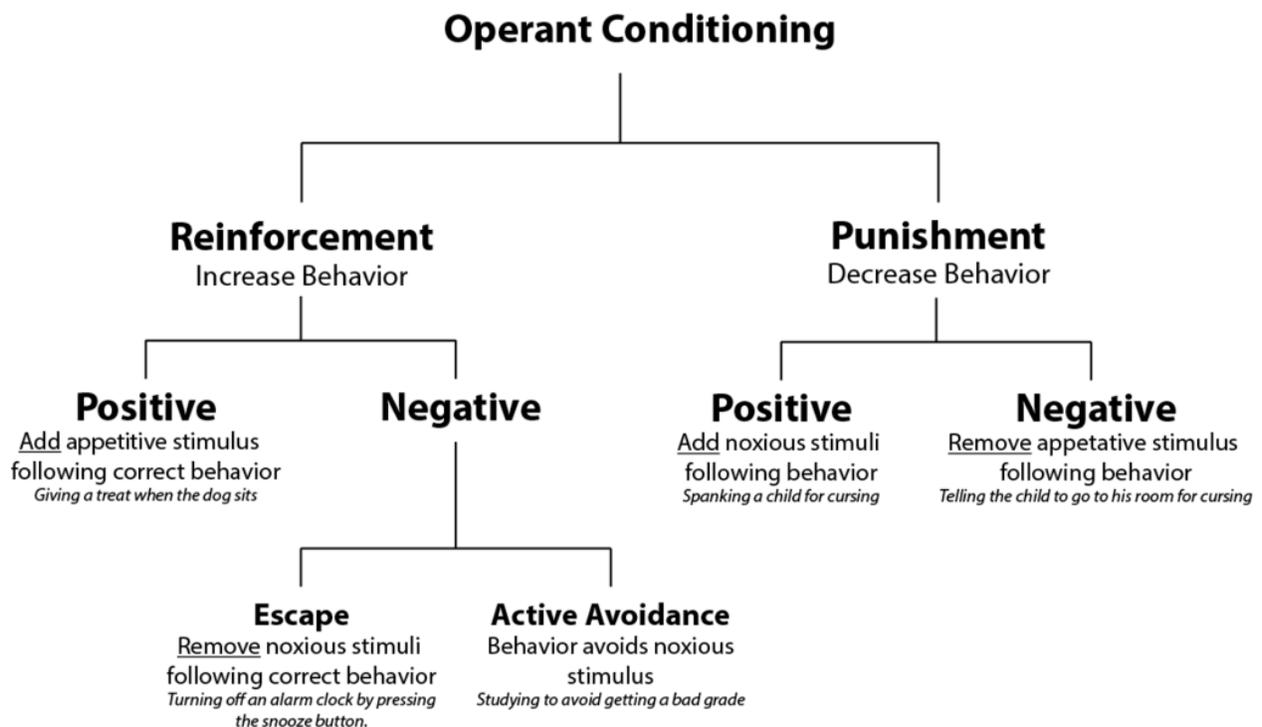*Garcia Effect* = the ease with which animals learn taste aversions

Learned taste aversions = when animals associate the taste of a food with symptoms (such as nausea or sickness) caused by a toxic, spoiled, or poisonous substance
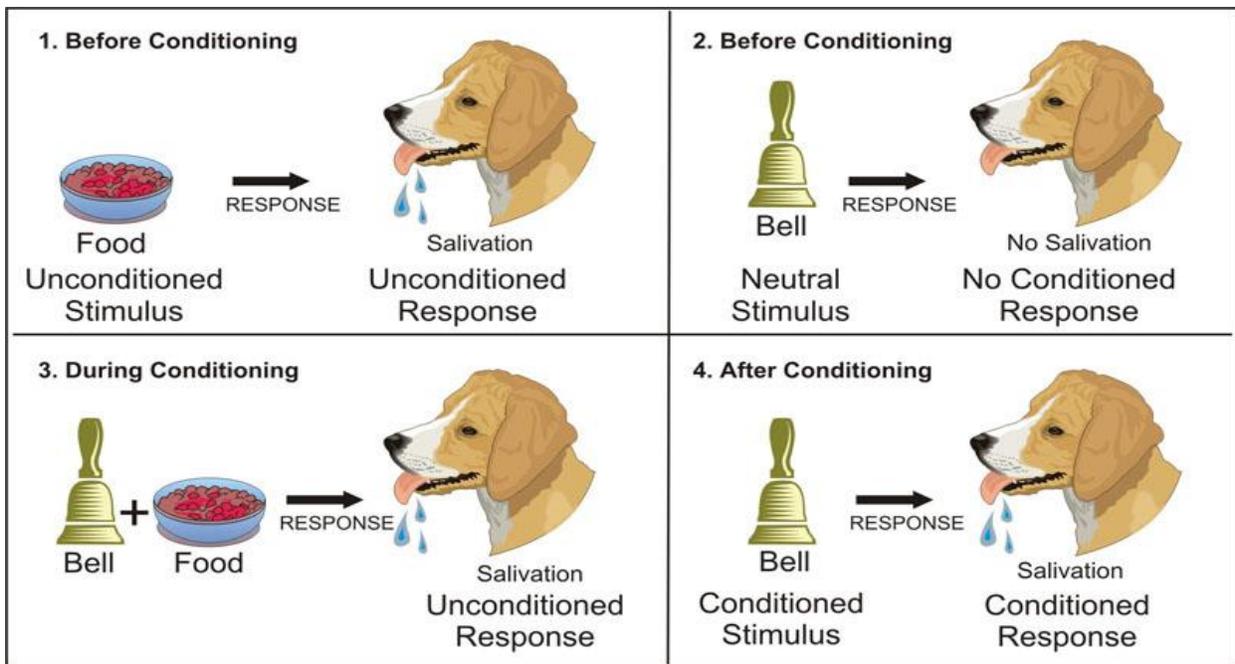
First-Order Conditioning		
Training:	Present NS + UCS = NCR	Present bell + food = salivation
Acquisition:	Present CS (originally NS) = CR	Present bell = salivation
Second-Order Conditioning		
Training:	Present new NS + CS = CR	Present light + bell = salivation
Acquisition:	Present new CS (originally new CS) = CR	Present light = salivation

Operant Conditioning (behaviors)

Thorndike's Law of Effect = behavior that is followed by pleasant consequences is likely to be repeated, and behavior followed by unpleasant consequences is less likely to be repeated

Operant Conditioning

Reinforcement
Increase Behavior

Punishment
Decrease Behavior

Positive
Add appetitive stimulus
following correct behavior
Giving a treat when the dog sits

Negative

Positive
Add noxious stimuli
following behavior
Spanking a child for cursing

Negative
Remove appetative stimulus
following behavior
Telling the child to go to his room for cursing

Escape
Remove noxious stimuli
following correct behavior
Turning off an alarm clock by pressing the snooze button.

Active Avoidance
Behavior avoids noxious
stimulus
Studying to avoid getting a bad grade

Shaping = reinforces the steps used to reach a desired behavior (e. g. teaching animals tricks)

Chaining = reinforcing individual responses occurring in a sequence, where one behavior cues and influences the subsequent behaviors (e.g. wake up early, washing hands, brush teeth, pack backpack)

Primary Reinforcers = biological, such as food, water and rest

Secondary Reinforcers = material, such as resting time, grades, tokens

General Reinforcer = special secondary reinforcer, such as money, can be traded for anything

Premack Principle = preferred behaviors, or behaviors with a higher level of intrinsic reinforcement, can be used as rewards, or reinforcements, for less preferred behaviors

Basic Conditioning Phenomena:
- *Acquisition* = initial stage of learning
- *Extinction* = unlearning behavior
- *Spontaneous Recovery* = reappearance of behavior after period of time
- *Generalization* = tendency to respond to similar stimuli
- *Discrimination* = ability to distinguish between different stimuli

Reinforcement Schedules

Continuous Reinforcement = rewarding every time the desired behavior is achieved

Partial-Reinforcement Effect = behaviors will be more resistant to extinction if the subject has been reinforced continuously

Instinctive Drift = tendency for animals to forgo rewards to pursue typical patterns of behavior

	Ratio	**Interval**
Fixed	Definition: Reinforcement is delivered after a set number of responses (high rate of responses) Example: A restaurant gives you a free meal after the purchase of 10 meals	Definition: Reinforcement is delivered after a behavior is performed following the passage of a fixed amount of time (lowest rate of responses) Example: Going to get a lunch at a restaurant that opens promptly at noon
Variable	Definition: Reinforcement is delivered after a variable number of responses (highest rate of responses) Example: Slot machines pay out on a variable ratio schedule – sometimes it takes just one pull to win, but sometimes it takes hundreds	Definition: Reinforcement is delivered after a behavior is performed following the passage of a variable amount of time (low rate of responses) Example: Checking for your email when your letter carrier's schedule is unpredictable

Other Types of Learning

Cognitive Learning

- occurs with acquisition of problem-solving abilities and with intelligence and conscious thought

Robert Rescorla's Contingency Model

- model of classical conditioning based upon a cognitive view of classical conditioning
- states that A is contingent upon B when A depends upon B and vice versa
- where the presence of one event reliably predicts the presence of the other

Observational Learning

- occurs when a subject's behavior is influenced by the subject's observation of others, who are called models

Latent Learning

- occurs without any obvious reinforcement of the behavior or associations that are learned

Abstract Learning

- understanding concepts rather than simply learning to exhibit a behavior in order to secure a reward

Insight Learning

- occurs when one suddenly realizes how to solve a problem
- occurs due to gradual strengthening of Stimulus-Response Connection

Famous Cognitive Learning Experiments

Researcher/Experiment	Major Finding	Take Home Message
Albert Bandura's Bobo Doll Experiments	Children Exposed to an aggressive model imitated the model's behavior	Aggression can be learned through observation
Edward Tolman's Latent Learning Experiments	Rats that ran a maze repeatedly evidenced dramatic improvement following the introduction of a reward	Rats learned their way around the maze, created and stored cognitive maps, and were able to use the maps when needed
Wolfgang Kohler's Insight Learning Experiments	Chimpanzees solved problems suddenly rather than gradually	Non-human animals are capable of insight