2017-03-08

What is Learning?

- **Learning** = a persistent change in an organisms behavior
  - At a basic level, learning can be thought about *associations*
    - Kind of similar to **classical conditioning**
      - A **neutral stimulus** preceeds an **unconditioned stimulus**, and the neutral stimulus produces a response to anticipate the unconditioned response

Classical Conditioning

- **Classical Conditioning**
  - **Unconditioned stimulus(UCS)** = a stimulus that *naturally* triggers a response
    - The dog senses food and salivates
  - **Unconditioned response(UCR)** = an unlearned response that naturally happens as a result of a UCS
  - **Neutral stimulus** = a stimulus that does not trigger a UCR
  - **Conditioned stimulus** = a neutral stimulus that has become a trigger for the desired UCR through a process of classical conditioning
    - The response is now called a **conditioned response**
  - Two steps of classical conditioning
    1. **Acquisition** = the initial stage where the association is made
    2. **Extinction** = the gradual reduction in the strength of the association
  - **Generalization** = the application of a conditioned behavior to a broader set of stimuli then intended
    - *e.g.*
      - a child thinking every tall male person is their dad
  - Conditioning only works when the UCS and neutral stimulus are paired in close proximity during acquisition

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Positive Reinforcement and Negative Reinforcement

- **Positive reinforcement** = the addition of a pleasing stimulus to reinforce behavior

- **Negative reinforcement** = the removal of an aversive stimulus to reinforce behavior
- Note that negative reinforcement is *not* the same thing as **punishment**
  - **Punishment** = the addition of an aversive stimulus to inhibit a behavior
    - Two types
      1. **Positive punishment** = the addition of an aversive stimulus to reinforce behavior
      2. **Negative punishment** = the removal of a pleasing stimulus to reinforce behavior
    - Punishment is sometimes effective, but not encouraged
      - Does not teach what the *acceptable* pattern of behavior is
      - Can produce hostility, passivity, or fear
      - Not very durable
      - Models aggression

Primary Reinforcement and Secondary Reinforcement

- **Primary reinforcement** = a form of operant conditioning that uses unlearned stimuli to reinforce behavior
  - *e.g.*
    - Using sugary foods to positively reinforce behavior by adding a pleasing, unlearned response
    - Using a drug to negatively reinforce behavior by removing an aversive, unlearned response
- **Secondary reinforcement** = a form of operant conditioning that uses learned stimuli to reinforce behavior
  - *e.g.*
    - Using the learned desire to accrue wealth to reinforce behavior

Schedules of Reinforcement

- **Immediate reinforcement** = a type of reinforcement where the duration between action and reinforcing stimulus is short
  - In contrast to **delayed reinforcers**
- **Continuous reinforcement** = a type of reinforcement where the stimulus and desired behavior are always paired
- **Intermittent reinforcement** = a type of reinforcement where the stimulus and desired behavior aren't always paired
  - Makes the process of learning the behavior more difficult

        * But, when it is learned, it is more durable
    - Also called **partial reinforcement**
- Four types of Reinforcement Schedules
    1. **Fixed ratio** = behavior and reinforcement are paired after a predictable amount of actions
        - *e.g.*
            * Tenth car wash is free!
    2. **Variable ratio** = behavior and reinforcement are paired after an unpredictable amount of actions
        - This proves to be the *most* durable form of reinforcement
            * Because the lack of reinforcement is *expected*
        - *e.g.*
            * Gambling
    3. **Fixed interval** = behavior and reinforcement are paried after a predictable amount of time
        - *e.g.*
            * Wage labor
    4. **Variable interval** = behavior and reinforcement are paired after an unpredictable amount of time
        - *e.g.*
            * Weather
            * Pop quizzes
            * DUI checkpoints

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Cognitive Approach to Learning

- **Latent learning** = a type of learning that isn't conditioned
    - Happens almost by accident
- **Cognitive map** = a mental scheme of a space
    - Studied by E.C. Tolman
- **Overjustification effect** = describes how extrinsic rewards tend to overpower intrinsic rewards
    - For example, if you love playing piano, and then you get a regular paycheck for playing, you motivate yourself with the extrinsic reward

        * Then, if the extrinsic reward is dropped, you have less motivation than you did starting

- **Intrinsic motivation** = the motivation to do something purely because you *enjoy* doing it
    - Generally, this is more *durable* than learned behavior with **extrinsic motivation**
- **Extrinsic motivation** = the motivation to do something purely because you are rewarded or punished if you do do or don't it, respectively
    - Is more prone to "burn-out"
- **Observational learning** = learning by imitation
    - Studied by Albert Bandura
    - **Modeling** = the process of learning a behavior through this means
    - **Prosocial behavior** = constructive, helpful behavior
        * Essentially the opposite of **antisocial behavior**
    - **Mirror neurons** = neurons in the frontal lobe that fire when performing an observed action or observing itself
        * Thought to be an explanation as to why imitation happens