Operant Conditioning

- Definition
- Classical vs. Operant Conditioning
- Four Basic Operant Procedures
- Factors that make Operant procedures more effective
- Primary and Secondary Reinforcers
- Shaping
# Conditioning

<table>
<thead>
<tr>
<th>Classical Conditioning:</th>
<th>Operant Conditioning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflex responses are associated with new stimuli</td>
<td>Learning based on consequences of responding</td>
</tr>
</tbody>
</table>

**Making Associations!!!**
## Classical vs. Operant Conditioning

<table>
<thead>
<tr>
<th>Classical Conditioning</th>
<th>Operant Conditioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflexive Behavior</td>
<td>Operant Behavior</td>
</tr>
<tr>
<td>Key component:</td>
<td>Key component:</td>
</tr>
<tr>
<td>Assoc. bet. 2 stimuli</td>
<td>Consequences of one’s Behavior</td>
</tr>
<tr>
<td>Measures:</td>
<td>Measured ONLY by the</td>
</tr>
<tr>
<td>Percentage of CRs</td>
<td>frequency (probability) of</td>
</tr>
<tr>
<td>Magnitude of CRs</td>
<td>the behavior</td>
</tr>
<tr>
<td>Latency of CRs</td>
<td></td>
</tr>
<tr>
<td>Direct physiological response</td>
<td></td>
</tr>
<tr>
<td>Indirect (approach/avoidance)</td>
<td></td>
</tr>
</tbody>
</table>
Four Basic Procedures

- Positive Reinforcement
- Negative Reinforcement
- Positive Punishment
- Negative Punishment (Response Cost)
**Operant Conditioning – 4 Consequences**

- Something Good can start or be presented
- Something Good can end or be taken away
- Something Bad can start or be presented
- Something Bad can end or be taken away
Operant Conditioning

Learning through voluntary behavior and its subsequent consequences

Reinforcement

Strengthen a response and makes it more likely to recur

Punishment

Weakens a response and makes it less likely to recur
Operant Conditioning – 4 Consequences

- **Positive**: technical term for "an event started" or "an item presented" is, since it's something that's *added* to the animal's environment.

- **Negative**: technical term for "an event ended" or "an item taken away" is, since it's something that's *subtracted*.
### Operant Conditioning - Reinforcements

**Positive reinforcement:** when a response is followed by receiving a reward or other desirable event (e.g., ‘Good job!’)

**Negative reinforcement:** when a response is followed by the removal of an unpleasant event (e.g., aspirin stops headache)

<table>
<thead>
<tr>
<th>Positive reinforcement</th>
<th>Negative reinforcement</th>
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<tr>
<td>Adds to &amp; <strong>strengthens</strong> behavior</td>
<td>Takes away &amp; <strong>strengthens</strong> behavior</td>
</tr>
<tr>
<td>Hungry, and eat a burger; Study hard, and get a good grade</td>
<td>Sunglasses to take away pain of bright sun</td>
</tr>
</tbody>
</table>
**Operant Conditioning – Punishments**

**Punishment**: any event that follows a response and decreases its likelihood of occurring again

**Positive punishment** = adding a stimulus, weakens likelihood of re-occurrence

**Negative punishment** = taking away a stimulus, weakens likelihood of re-occurrence
## Operant Conditioning - Punishments

<table>
<thead>
<tr>
<th>Positive punishment</th>
<th>Negative punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adds to &amp; <strong>weaken</strong> behavior:</td>
<td>Takes away &amp; <strong>weaken</strong> behavior:</td>
</tr>
<tr>
<td>• You have to run 4 extra laps because you were late to practice</td>
<td>• Your instructor makes you sit elsewhere because you won’t stop talking to your friends</td>
</tr>
<tr>
<td>• You have to do more chores because you received bad grades</td>
<td>• A teenager’s driving privileges are removed because he didn’t come home on time</td>
</tr>
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</table>
Operant Conditioning

Side effects of punishment:

- Increased aggression
- Passive aggressiveness
- Avoidance behavior
- Modeling
- Temporary suppression
- Learned helplessness
Consequences are subjective!

*Simpsons
Field trip!
Uses of Partial Reinforcement

Shaping
Reinforce successive approximations of target behavior
- one step at a time
- keep raising the bar
Creating New Behaviors
(As opposed to just changing the frequency of a behavior that already exists)

Shaping

- Begin with a behavior the subject already does, and shape it to the behavior(s) you want

- Need to reinforce each step (successive approximation)
  - Stop reinforcing a step to “encourage” subject to try new behaviors leading to the next step
  - Goal: subject performs Target Behavior
Which Procedure?

- What was the Behavior?
- What were the Consequences?
- Was something Gotten/Added, or Lost/Taken away?
- Did Probability of future behavior go Up, or Down?
Subtypes of Negative Reinforcement

- **Escape**
  - Experience something, *then* perform behavior

- **Avoidance**
  - Perform behavior *before* you experience something
Making Operant Conditioning more Effective

- Contingency (Dependency)
- Contiguity (Immediacy)
- Size
- Deprivation
Primary & Secondary Reinforcers

- Reinforcer = consequence that strengthens behavior

- Primary positive $S^R$: typically tied to a biological need
  - Food, Water, Sex, Sleep

- Primary negative $S^R$: Escape
Primary & Secondary Reinforcers cont.

- Secondary Reinforcers (Conditioned Reinforcers)
  - SRs that have acquired value through being:
    1) Paired with an established SR
    OR
    2) Exchanged with an established SR
  - Established SRs can be 1⁰ or 2⁰ reinforcers themselves

- Money; Praise (a social SR)
Secondary Reinforcer Subtypes

- **Standard**: exchangeable *ONLY* for one type of Primary \( S^R \)

- **Generalized Conditioned Reinforcer**
  - Can be exchanged for *multiple* reinforcers

- **Advantages**
  - Cheaper
  - More immediate
  - Avoid satiation
  - More conveniently delivered
  - Not tied to any specific deprivation
Extrinsic & Intrinsic Reinforcers

- **Extrinsic Reinforcement:** getting an external reinforcer for performing a behavior
  - Reading *War and Peace* for a good grade in class

- **Intrinsic Reinforcement:** getting reinforcement simply by performing the behavior
  - Reading *War and Peace* for pleasure