Operant Conditioning

- Operant conditioning
  - Association between VOLUNTARY behavior and its consequence
  - Behavior has consequences
- ABC's: Antecedents-Behavior-Consequence
- Thorndike's Law of effect
- "Sit, Houston!"
  - Make millions training dogs!
  - Dog tricks

B.F. Skinner

- "The major problems of the world today can be solved only if we improve our understanding of human behavior" About Behaviorism (1974)
- Author of "Beyond Freedom and Dignity"
- Study rats and pigeons in a "Skinner box"

Rat in a Skinner Box

http://www.youtube.com/watch?v=PQID7dDrBxs

Influencing behavior: Not just for dogs

- B.F. Skinner

Classical vs. operant conditioning

Effect of Stimulus (Consequence) on Behavior:

<table>
<thead>
<tr>
<th>Positive Reinforcement</th>
<th>Punishment: Decrease Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive: If Response Then Stimulus</td>
<td></td>
</tr>
<tr>
<td>Negative Reinforcement</td>
<td>Punishment: Increase Probability</td>
</tr>
<tr>
<td>Negative: If Response Then NO Stimulus</td>
<td></td>
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</tbody>
</table>

Positive Reinforcement
- Stimulus: usually good
  - Ex: rewards

Negative Reinforcement
- Stimulus: usually bad
  - Ex: Spanking

Tricks by Addition
- Omission
- Punishment by Subtraction

Positive Punishment
- Stimulus: usually bad
  - Ex: Spanking

Negative Punishment
- Stimulus: usually good
  - Ex: Avoidance, Escape

Ex: Grounded
Identify the contingency for each:
Positive/Negative Reinforcement/Punishment
- Turn off alarm clock when you wake up.
- Given a ticket by a cop for speeding.
- Choke collar on dog loosens when dog walks close to owner.
- If you make 3.5 or higher, you can have a trip for spring break.
- I press cancel on the microwave so I won’t hear it beep.
- Field trip is cancelled due to poor behavior of kids.
- Hand is burned when touch hot stove.
- “I’m not talking to you after what you did.”
- Get a letter of congratulations for a job well-done.

Shaping behaviors
- How do you train a pigeon to turn in a circle?
- Shaping = differential reinforcement of successive approximations
- After each response -> stricter criterion for reinforcement

Applications?
- Autism (applied behavior analysis)
  http://www.youtube.com/watch?v=iyCxtSOLZlD
- Sports, music, skills, parenting
  http://www.youtube.com/watch?v=IcLtJqjlrHA&feature=related
- Rat Basketball
  http://www.wofford.edu/psychology/content.aspx?id=4844

Schedules of reinforcement
- Continuous (CRF) vs. Partial Reinforcement
- Fixed-ratio
- Fixed-interval
- Variable-ratio
- Variable-interval
- Effect of extinction?
  http://www.youtube.com/watch?v=euINCrDbbD4

Cumulative recorder
Sample cumulative records of 4 simple reinforcement schedules

Figure 6.2 Sample cumulative records of different pigeons pecking a response key on four simple schedules of food reinforcement: fixed ratio 120, variable ratio 360, fixed interval 4 minute, and variable interval 2 minute. (From Schedule of Reinforcement, by C. B. Ferster and B. F. Skinner, 1957, Appleton-Century-Crofts.)

Extinction: Partial v Continuous

Partial reinforcement
Continuous reinforcement

Operant conditioning applications

- Animal training
  - “Don’t shoot the dog: The new art of teaching and training” K. Pryor
- Teaching techniques
  - Quiet the class; Produce good grades
- Superstitious behavior
  - Behavior and consequence linked (variable-ratio)
- Understand disorder and create therapy
  - Depression; Anorexia; Drug abuse
- ADD/ADHD and Autism

Mechanism of Depression: Seligman, 1975

“Learned helplessness”

- Escape shock by moving within 10s after light
  - Red: can avoid shock
  - Blue: can’t change outcome
- Move to shuttle box
  - Red: learns task
  - Blue: becomes passive
- Why abused wives stay?

Parenting: “behavior modification”

- Positive punishment vs. negative punishment
- Effect of types of punishments?
- Limitations of positive punishment
  - Doesn’t teach correct response
  - May increase aggression
- Other forms of punishment
  - Time-out
  - Penalty or fine
  - Correction

Modeling behavior

- Operant conditioning
  - Organism learns the consequences of its own behavior.
- Observational learning
  - Organism learns the consequences of another’s behavior.
  - Rather than trial-and-error
  - Influenced by presence of role model
    - Imitate, model, behavior of significant others
    - Examples? Sports, arts, parenting
Modeling behavior

- Bandura et al. (1963) – Bobo doll study
  - Learn what is fun from others
  - Learn how to do things

- Applications?

Think about your own life:

- What is a behavior you want to increase?
- What is a behavior you want to decrease?

- For each, explain how each of these would influence your target behaviors:
  - Positive reinforcement
  - Negative reinforcement
  - Punishment by addition
  - Punishment by subtraction

- What schedules of reinforcement would you use?