OPERANT CONDITIONING & OBSERVATIONAL LEARNING
Outline

- Operant conditioning
  - Reinforcement
  - Punishment
  - Schedules of Reinforcement
  - Shaping and other considerations
- Observational learning
From Classical to Operant Conditioning

- Classical Conditioning
  - Association of two stimuli (CS and US)
  - Respondent behavior

- Operant Conditioning
  - Association between behavior and result
  - Operant behavior
Operant Conditioning

- **B.F. Skinner**

- **Skinner Box** (a.k.a. “Operant Chamber”)
  - Pressing or pecking of bar/key which releases food/water
  - Responses are recorded

B.F. Skinner (1904-1990)
Operant Conditioning

Two types of operant conditioning:

- **Reinforcement**
  - Increases frequency of behavior
  - Example: Food for pressing the key

- **Punishment**
  - Decreases frequency of behavior
  - Example: Shocked for pressing the key

- Reinforcers and punishers can vary by person and situation
Reinforcement

- (Reinforcement: Behavior strengthened)
  - **Positive Reinforcement**
    - Adding a desirable or pleasant stimulus to increase the frequency of the behavior
    - Ex: allowance for chores; candy for potty training
  - **Negative Reinforcement**
    - Removing an aversive or unpleasant stimulus to increase the frequency of the behavior
    - Ex: Removing pain; Getting out of extreme cold/heat
Reinforcement

- **Primary Reinforcers**
  - Innately satisfying
  - Example: Food

- **Secondary/Conditioned Reinforcers**
  - Learned; Not satisfying by nature
  - Example: Money, grades
Punishment

(Punishment: Behavior weakened)

Positive Punishment
- Addition of an aversive or unpleasant stimulus to decrease the frequency of the behavior
- Example: Spanking; Detention

Negative Punishment
- Removal of a pleasant or desirable stimulus to decrease the frequency of the behavior
- Example: Time-out; Grounding
Operant Conditioning “pop quiz”

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<th>Strengthen Behavior</th>
<th>Weaken Behavior</th>
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<tr>
<td><strong>Add Stimulus</strong></td>
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Reinforcement/Punishment
- Positive reinforcement
- Negative reinforcement
- Positive punishment
- Negative punishment

Pleasant/Unpleasant
- Pleasant stimulus
- Unpleasant stimulus
**Operant Conditioning Activity**

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Example: Beth hates it when people refer to her by her full name, Elizabeth. Despite that, Beth’s roommate continues to call her Elizabeth.

- In what ways could Beth use each of the above to change her roommate’s behavior?
Reinforcement & Punishment: Summary

- **Reinforcement**: increases frequency of behavior
  - **Positive**: Adding a pleasant stimulus
  - **Negative**: Removing an unpleasant stimulus
  - Primary & secondary reinforcers

- **Punishment**: decreases frequency of behavior
  - **Positive**: Adding an unpleasant stimulus
  - **Negative**: Removing a pleasant stimulus

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Schedules of Reinforcement: Outline

- Continuous schedule of reinforcement

- Partial/Intermittent schedules of reinforcement
  - Ratio
    - Fixed-Ratio
    - Variable-Ratio
  - Interval
    - Fixed-Interval
    - Variable-Interval
Schedules of Reinforcement

- Frequency of reinforcement

- Continuous Reinforcement
  - Reinforce every time behavior occurs
  - Rapid learning; Rapid extinction

- Partial/Intermittent Reinforcement
  - Sometimes reinforce, sometimes don’t
  - Slower learning; more resistant to extinction
  - 4 schedules of partial reinforcement: Ratio or Interval
Partial Reinforcement Schedules

- **Ratio**: Based on frequency of behavior

- **Fixed-Ratio**
  - Reinforce after set number of responses
  - Ex: Every 5 key presses
Partial Reinforcement Schedules

- **Ratio**: Based on frequency of behavior

- **Variable–Ratio**
  - Reinforce after a varied number of responses
  - Ex: On average, every 5 key presses
Partial Reinforcement Schedules

- **Interval:** Based on time

- **Fixed-Interval**
  - Reinforce after fixed time period
    - Ex: Every 2 minutes

Note: Shorter intervals generate higher rates overall
Partial Reinforcement Schedules

- **Interval**: Based on time

- **Variable-Interval**
  - Reinforce after varying time period
  - Ex: About every 2 minutes

- VI
  - Higher resistance to extinction

- Note: Shorter intervals generate higher rates overall

- Low, steady rate without pauses
Video: Interview with BF Skinner

- What is Skinner’s view of free will?
- What evidence does Skinner use to support his view?
Other Operant Conditioning Concepts

- **Shaping**
  - Reinforcement of behaviors that are gradually closer to the desired behavior

- **Differential Reinforcement of Other**
  - Reinforcing the behavior opposite of an undesirable behavior
Important Considerations

- **Immediacy**
  - Consequence needs to be immediate

- **Unnecessary reinforcement?**

- **Punishment**
  - Immediate
  - Mild
Summary so far...

- Schedules of Reinforcement
  - Continuous
  - Partial/Intermittent
    - Fixed Ratio
    - Variable Ratio
    - Fixed Interval
    - Variable Interval
- Shaping and Differential Reinforcement
OBSERVATIONAL LEARNING
Observational Learning

- **Observational learning**
  - Learning by observing others

- **Modeling**
  - Process of observing and imitating a specific behavior

- **Mirror neurons**
  - Ex. Empathy
Observation: Bandura’s Experiments

- Albert Bandura
  - Bobo Doll experiments
    - Finding: Frustrated children exposed to aggressive model exhibited more aggression towards doll than those not exposed

Albert Bandura (1925 - )
Video: Bandura’s Bobo Doll Experiment
Social learning example
Observation: Potential Implications

- Positive (prosocial) behavior
- Negative impacts
  - Punishment?
- Sources of impact
Observational Learning: Summary

- Overview of Observational Learning
  - Modeling
  - Mirror Neurons

- Albert Bandura
  - Bobo Doll Experiments

- Implications of observational learning