CHAPTER 6

Learning

Write down important terms in this video. Explain Skinner’s view on “Free Will.”

Lecture Overview

• Classical Conditioning
• Operant Conditioning
• Cognitive-Social Learning
• The Biology of Learning
• Using Conditioning & Learning Principles

Introductory Definitions

• Learning: relatively permanent change in behavior or mental processes resulting from practice or experience
• Conditioning: process of learning associations between environmental stimuli & behavioral responses
Classical Conditioning

Ivan Pavlov

- Classical Conditioning: learning that occurs when a previously neutral stimulus (NS) is paired (associated) with an unconditioned stimulus (UCS) to elicit a conditioned response (CR)

Pavlov’s Original Experiment

Classical Conditioning: Key Terms

- Neutral Stimulus (NS): before conditioning doesn’t naturally elicit response of interest
- Unconditioned Stimulus (UCS): elicits UCR without prior conditioning
- Unconditioned Response (UCR): unlearned reaction to UCS occurring without prior conditioning
Classical Conditioning: Key Terms (Continued)

- **Conditioned Stimulus (CS):** previously NS that, through repeated pairings with UCS, now causes a CR
- **Conditioned Response (CR):** learned reaction to a CS occurring because of prior repeated pairings with an UCS

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Pause & Reflect: Psychology & Life

- What's so funny?
Classical Conditioning (Continued)

- **Conditioned Emotional Response (CER):**
  - Emotional responses are classically conditioned to a previously neutral stimulus (NS)
  - Many of our likes, dislikes, prejudices, & fears are examples of CER

**John B. Watson**

- Watson emphasized strictly observable behavior
- Watson founded “behaviorism.”
- Behaviorism explains behavior as a result of observable stimuli and observable responses.

**Watson & Rayner Created a CER—Little Albert’s Fear of Rats**
Six Basic Principles of Classical Conditioning

**Basic Principle:**

- **Stimulus Generalization:**
  - Learned response to stimuli that are similar to the original conditioned stimuli (CS)

- **Stimulus Discrimination:**
  - Learned response to specific stimulus

**Basic Principle:**

- **Extinction & Spontaneous Recovery**
  - **Extinction:** gradual weakening or suppression of a previously conditioned response (CR)
  - **Spontaneous Recovery:** reappearance of a previously extinguished conditioned response (CR)
Reconditioning

• **Reconditioning**: a CS is reintroduced after extinction
• The conditioning occurs much faster the 2nd time
• This is why it is difficult to break a bad habit

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**Basic Principle:**
**Higher Order Conditioning**

• **Higher-Order Conditioning**: neutral stimulus (NS) becomes a conditioned stimulus (CS) through repeated pairings with a previously conditioned stimulus (CS)
Using Pavlov’s classic experiment with the salivating dog, can you label the NS, UCS, UCR, CS, & CR?

Compare & contrast stimulus generalization & stimulus discrimination?

Pause & Reflect: Assessment

1. Using Pavlov’s classic experiment with the salivating dog, can you label the NS, UCS, UCR, CS, & CR?

2. Compare & contrast stimulus generalization & stimulus discrimination?

Operant Conditioning

- Operant Conditioning: learning in which voluntary responses are controlled by their consequences
- Reinforcement: a consequence that strengthens a response & makes it more likely to occur.
- Punishment: a consequence that weakens a response & makes it less likely to occur.
Operant Conditioning (Continued)

• Thorndike’s contribution

• Law of Effect: probability of an action being repeated is strengthened when followed by a pleasant or satisfying consequence

Operant Conditioning (Continued)

• B. F. Skinner: emphasized observable stimuli & responses

Operant Conditioning’s Basic Principles

• Reinforcement: strengthening a response
  – Primary & secondary reinforcers
  – Positive & negative reinforcement
Operant Conditioning’s Basic Principles

Positive or negative reinforcement strengthens a behavior.

Punishment weakens a behavior.

Operant Conditioning’s Basic Principles (Continued)

- Primary Reinforcers: normally satisfy an unlearned biological need (e.g., food, sex)
- Secondary Reinforcers: learned value (e.g., attention, praise, money)

Operant Conditioning’s Basic Principles (Continued)

- Positive Reinforcement: adding (or presenting) a stimulus, which strengthens a response & makes it more likely to recur (e.g., praise)
Operant Conditioning’s Basic Principles (Continued)

- Negative Reinforcement: taking away (or removing) a stimulus, which strengthens a response & makes it more likely to recur (e.g., headache removed after taking an aspirin)

Operant Conditioning’s Basic Principles: Four Partial Schedules of Reinforcement

1. Fixed Ratio (FR): reinforcement occurs after a predetermined set of responses; the ratio (number or amount) is fixed (e.g., vending machines)

2. Variable Ratio (VR): reinforcement occurs unpredictably; the ratio (number or amount) varies (e.g., slot machines)

3. Fixed Interval (FI): reinforcement occurs after a predetermined time has elapsed; the interval (time) is fixed (e.g., paycheck)

4. Variable Interval (VI): reinforcement occurs unpredictably; the interval (time) varies (e.g., pop quizzes)
Operant Conditioning’s Basic Principles: Four Partial Schedules of Reinforcement

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Definition</th>
<th>Response Rate</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed ratio (FR)</td>
<td>Reinforcement is given after a predetermined number of responses</td>
<td>High</td>
<td>Pigeons in a Skinner box, bell for food, etc.</td>
</tr>
<tr>
<td>Variable ratio (VR)</td>
<td>Reinforcement is given after a variable number of responses</td>
<td>Middle</td>
<td>Children's behavior in a classroom</td>
</tr>
<tr>
<td>Fixed interval (FI)</td>
<td>Reinforcement is given at a fixed interval after a variable number of responses</td>
<td>Low</td>
<td>Animals in a research setting</td>
</tr>
<tr>
<td>Variable interval (VI)</td>
<td>Reinforcement is given at a variable interval after a variable number of responses</td>
<td>Low</td>
<td>Animals in a research setting</td>
</tr>
</tbody>
</table>

Pause & Reflect: Assessment

- If you wanted to *increase* the overall number of responses, which schedule of reinforcement should you choose?

Operant Conditioning’s Basic Principles (Continued)

- **Shaping:** reinforcement is delivered after successive approximations of the desired response

- Partial reinforcement is important in maintaining behavior.
Operant Conditioning’s Basic Principles (Continued)

• Punishment: weakening a response
  – Positive & negative punishment

• Positive Punishment: adding (or presenting) a stimulus that weakens a response & makes it less likely to recur (e.g., shouting)

• Negative Punishment: taking away (or removing) a stimulus that weakens a response & makes it less likely to recur (e.g., restriction, jail)
Operant Conditioning

- Any process that adds or takes away something causing a behavior to decrease is punishment.

Operant Conditioning’s Basic Principles (Continued)

Positive punishment:
- Adds stimulus and increases behavior.
- You must take extra credit in your gym class because you are late.
- A parent takes away a child’s privilege following a poor report card.
- Your boss complains about your performance.

Negative punishment:
- Takes stimulus away and decreases behavior.
- You’re excluded from gym class because you are late.
- A parent takes away a teen’s cell phone following a poor report card.
- You lose electronic privileges due to poor performance.

Pause & Reflect: Assessment

- Using the chart on the following slide, can you fill-in-the-blanks with the appropriate terms?
Punishment

- To be effective, punishment must be **immediate** and **consistent**.
- When punishment is not immediate, during the delay the behavior is likely to be reinforced on a partial schedule which makes it highly resistant to extinction.
  - Creates addictions like gambling.
- Learns what not to do, but not what to do.
Side Effects of Punishment

- **Passive Aggressiveness**
  b/c aggression toward punisher leads to more punishment, one resorts to...

- **Avoidance behavior**
  try to avoid punisher

- **Modeling**
  punisher serves as model for same behavior he/she is trying to stop

Side Effects of Punishment

- **Learned Helplessness**
  If you repeatedly fail in your attempts to control your environment, you acquire a general sense of powerlessness or learned helplessness & make no further attempts to escape

Side Effects of Punishment

- **Temporary suppression**
  Punishment suppresses behavior temporarily while the punisher is nearby

- **Increased Aggression**
  Punisher is rewarded for applying punishment because it produces a decrease in undesired behavior
Pause & Reflect: Assessment

1. Briefly explain how reinforcement differs from punishment.
2. Give a personal example of positive reinforcement, negative reinforcement, positive punishment, & negative punishment.

Cognitive-Social Learning

- Cognitive-Social Learning: emphasizes the roles of thinking & social learning in behavior

- S-O-R: stimulus-organism-response

Cognitive-Social Learning (Continued)

- Kohler’s chimps demonstrated insight learning (sudden understanding of a problem that implies the solution).
Cognitive-Social Learning (Continued)

• Tolman's rats built a cognitive map (a mental image of a three-dimensional space). They also displayed latent learning (hidden learning that exists without behavioral signs).

Latent Learning

PSYCHOLOGY

Cognitive-Social Learning (Continued)

• Observational Learning: learning new behaviors or information by watching & imitating others

Bandura's Famous Bobo Doll study

Also known as "Modeling."

PSYCHOLOGY

Pause & Reflect: Critical Thinking

• Note the increasing bicep circumference of these G.I. Joe action figures. How might young boys & adult men be affected by this type of modeling & observational learning?
Cognitive-Social Learning (Continued)

- Observational Learning involves four processes:
  1. Attention
  2. Retention
  3. Motor Reproduction
  4. Reinforcement

The Biology of Learning: Neuroscience & Learning

- General findings—learning leads to new synaptic connections & alterations in many brain structures.
The Biology of Learning: Neuroscience & Learning

- Enriched vs. deprived environments lead to biological changes in both behavior & mental processes.

Mirror Neurons & Imitation

- Specific neurons – empathy & imitation
- "Share their pain."
- Smile vs. frown
- Athletic events
- Biological mechanism for imitation
- Emotional deficits in autism and schizophrenia

The Biology of Learning: Evolution & Learning

- Biological Preparedness: built-in (innate) readiness to form associations between certain stimuli & responses
- Taste Aversion: classically conditioned negative associations of food with illness
The Biology of Learning: Evolution & Learning (Continued)

- Instinctive Drift: conditioned responses shift (or drift) back toward innate response patterns

Using Conditioning & Learning Principles

- Classical Conditioning can be seen in:
  - Marketing
  - Prejudice
  - Medical Treatments
  - Phobias
Using Conditioning & Learning Principles

- **Operant Conditioning** can be seen in:
  - Prejudice
  - Biofeedback
  - Superstitions

- **Cognitive-Social Learning** can be seen in:
  - Prejudice
  - Media Influences

- **Prejudice**: gains attention; increases one’s self-esteem; stimulus generalization

- **Biofeedback**: learn to control relaxation, heart rate, etc.

- **Superstitions**: accidental reinforcement
Conditioning & Learning

Media influences:
NS (logo) + CS (attractive celebrity)
NS \rightarrow CS

Stereotypical roles & demeaning of women & minorities
Initiates & reinforces prejudice
Observational learning
You get good at what you practice – violence begets violence

Pause & Reflect: Critical Thinking

- Has reading Chapter 6, or viewing these Power Point slides, changed your beliefs or attitudes about using conditioning to control behavior? Why or why not?

End of CHAPTER 6