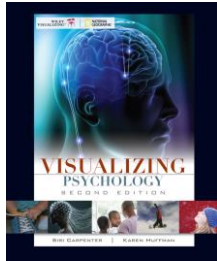




# CHAPTER 6

## Learning

Write down important terms in this video. Explain Skinner's view on "Free Will."



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## Lecture Overview

- [Classical Conditioning](#)
- [Operant Conditioning](#)
- [Cognitive-Social Learning](#)
- [The Biology of Learning](#)
- [Using Conditioning & Learning Principles](#)



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## 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

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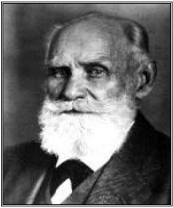
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# Classical Conditioning

## 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)

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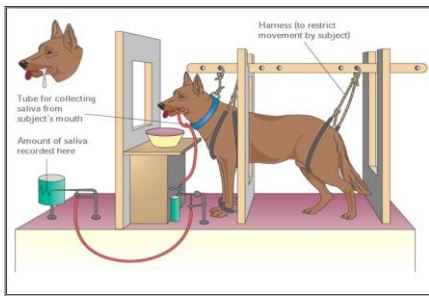
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# Pavlov's Original Experiment




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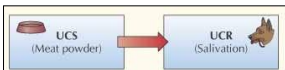
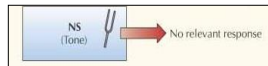
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# Classical Conditioning: Key Terms

- **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




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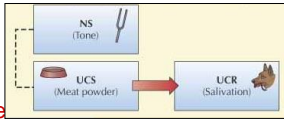
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## Classical Conditioning: Key Terms (Continued)

- **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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Pavlov Example		
<p><b>Step 1</b> Before conditioning The neutral stimulus (NS) produces no relevant response. The unconditioned (unlearned) stimulus (UCS) elicits the unconditioned response (UCR).</p>		
<p><b>Step 2</b> During conditioning The neutral stimulus (NS) is repeatedly paired with the unconditioned (unlearned) stimulus (UCS) to produce the unconditioned response (UCR).</p>		
<p><b>Step 3</b> After conditioning The neutral stimulus (NS) has become a conditioned (learned) stimulus (CS). This CS now produces a conditioned (learned) response (CR), which is usually similar to the previously unconditioned (unlearned) response (UCR).</p>		
<p><b>Summary</b> An originally neutral stimulus (NS) becomes a conditioned stimulus (CS), which elicits a conditioned response (CR).</p>		

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## Pause & Reflect: Psychology & Life

- What's so funny?




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### 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



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### Classical Conditioning



John B. Watson

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

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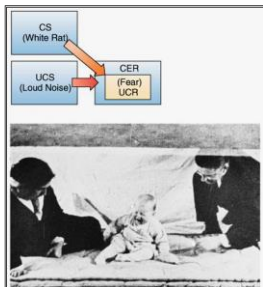
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### Watson & Rayner Created a CER— Little Albert's Fear of Rats



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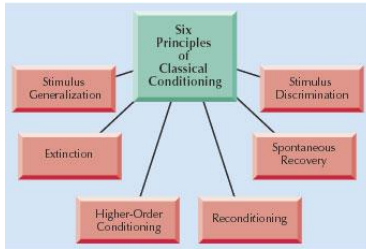
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### Six Basic Principles of Classical Conditioning




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### Basic Principle: Stimulus Generalization

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



ALL Snakes bite!



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




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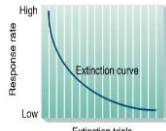
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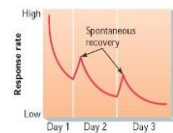


### Basic Principle: Extinction & Spontaneous Recovery

- **Extinction:** gradual weakening or suppression of a previously conditioned response (CR)



- **Spontaneous Recovery:** reappearance of a previously extinguished conditioned response (CR)




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## Reconditioning

- **Reconditioning:** a CS is reintroduced after extinction
- The conditioning occurs much faster the 2<sup>nd</sup> 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)




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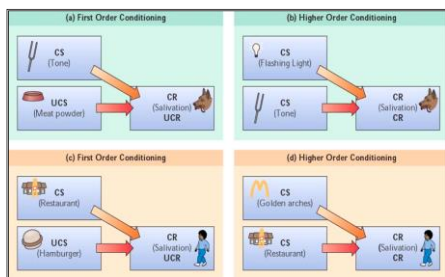
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## Basic Principle: Higher Order Conditioning




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### 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




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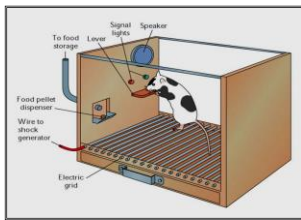
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### Operant Conditioning (Continued)

- **B. F. Skinner:** emphasized observable stimuli & responses




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### Operant Conditioning's Basic Principles

- **Reinforcement:** strengthening a response
  - **Primary & secondary reinforcers**
  - **Positive & negative reinforcement**




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### Operant Conditioning's Basic Principles



Positive or negative reinforcement strengthens a behavior

Punishment weakens a behavior



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### 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)



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### 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)



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## 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)

Video →




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## 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)




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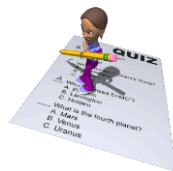
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## Operant Conditioning's Basic Principles: Four Partial Schedules of Reinforcement

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)




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### Operant Conditioning's Basic Principles (Continued)

- **Punishment:** *weakening* a response
  - **Positive & negative punishment**




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### Operant Conditioning's Basic Principles (Continued)



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

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### Operant Conditioning's Basic Principles (Continued)

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




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# Operant Conditioning

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




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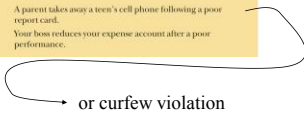
# Operant Conditioning's Basic Principles (Continued)

**Positive punishment**  
Adds stimulus (+) and weakens the behavior

You must run four extra laps in your gym class because you were late.  
A parent adds chores following a child's poor report card.  
Your boss complains about your performance.

**Negative punishment**  
Takes stimulus away (-) and weakens the behavior

You're excluded from gym class because you were late.  
A parent takes away a teen's cell phone following a poor report card.  
Your boss reduces your expense account after a poor performance.




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## Pause & Reflect: Assessment

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

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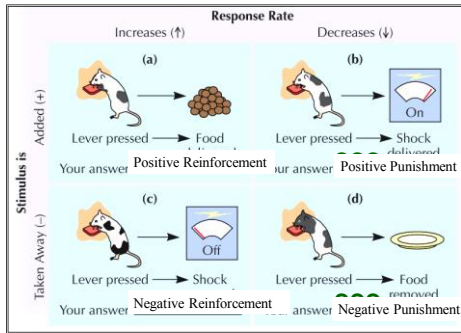
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	Classical Conditioning	Operant Conditioning
<b>Pioneers</b>	Ivan Pavlov John B. Watson	Edward Thorndike B. F. Skinner
<b>Major Terms</b>	Neutral stimulus (NS) Unconditioned stimulus (UCS) Conditioned stimulus (CS) Unconditioned response (UCR) Conditioned response (CR) Conditioned emotional response (CER)	Reinforcers (primary and secondary) Reinforcement (positive and negative) Punishment (positive and negative) Shaping Reinforcement schedules (continuous and partial)
<b>Example</b>	Cringing at the sound of a dentist's drill	A baby cries and you pick it up
<b>Shared Terms</b>	Generalization Discrimination Extinction Spontaneous recovery	Generalization Discrimination Extinction Spontaneous recovery
<b>Major Differences</b>	Learning based on paired associations Involuntary (subject is passive)	Learning based on consequences Voluntary (subject is active and "operates" on the environment)
<b>Order of Effects</b>	NS generally comes <i>before</i> the UCS	Reinforcement or punishment come <i>after</i> the behavior

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## 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




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### 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

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### 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

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### 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




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### 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**.




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### Cognitive-Social Learning

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



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

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### Cognitive-Social Learning (Continued)

- Kohler's chimps demonstrated **insight** learning (sudden understanding of a problem that implies the solution).




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### 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




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### 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."

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### 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?

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### Cognitive-Social Learning (Continued)

- **Observational Learning** involves four processes:

1. **Attention**
2. **Retention**
3. **Motor Reproduction**
4. **Reinforcement**




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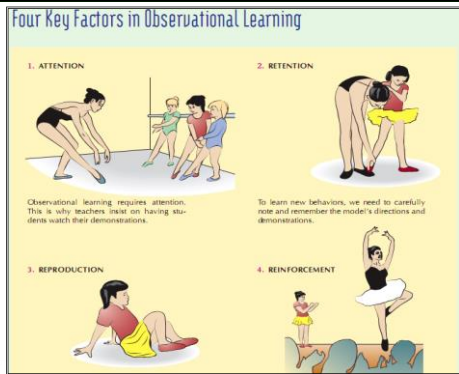
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### The Biology of Learning: Neuroscience & Learning

- **General findings--** learning leads to new synaptic connections & alterations in many brain structures.




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### The Biology of Learning: Neuroscience & Learning



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

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### 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




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### 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

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# The Biology of Learning: Evolution & Learning (Continued)



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




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# Using Conditioning & Learning Principles

- **Classical Conditioning** can be seen in:

- Marketing
- Prejudice
- Medical Treatments
- Phobias




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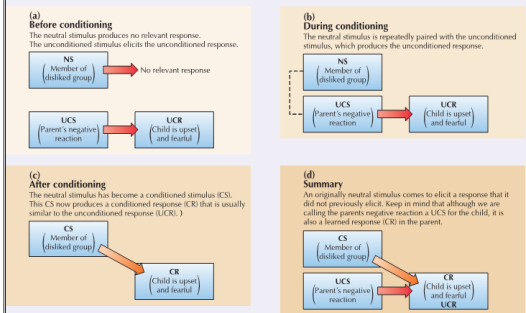
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## Prejudice and Classical Conditioning




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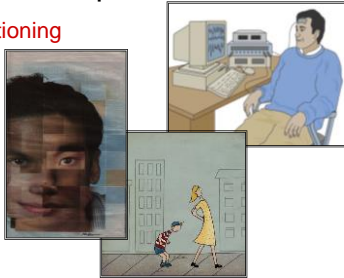


### Using Conditioning & Learning Principles

• **Operant Conditioning**

can be seen in:

- Prejudice
- Biofeedback
- Superstitions




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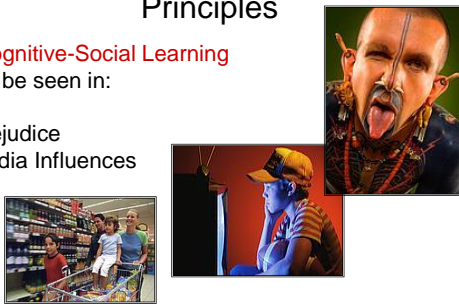


### Using Conditioning & Learning Principles

• **Cognitive-Social Learning**

can be seen in:

- Prejudice
- Media Influences




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### Conditioning & Learning

- Prejudice: gains attention; increases one's self-esteem; stimulus generalization
- Biofeedback: learn to control relaxation, heart rate, etc.



•Superstitions:  
accidental  
reinforcement




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# Conditioning & Learning



Media influences:

NS (logo) + CS (attractive celebrity)

NS → CS

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

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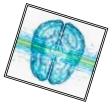
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# Pause & Reflect: Critical Thinking

- 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?




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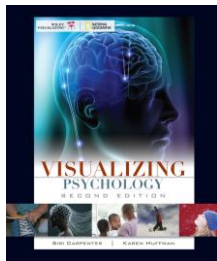
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# End of CHAPTER 6

Learning




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