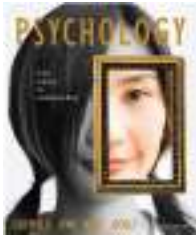


Psychology:
From Inquiry to Understanding 2/e

Scott O. Lilienfeld
Steven Jay Lynn
Laura Namy
Nancy J. Woolf

Prepared by Caleb W. Lack



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Chapter Six

Learning:
How Nurture Changes Us

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What is Learning?

- Does this event represent an example of learning?
- The cessation of thumb sucking by an infant.

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What is Learning?

- Does this event represent an example of learning?
- The acquisition of language in children..

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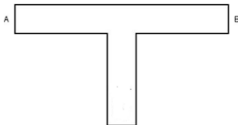
What is Learning?

- Does this event represent an example of learning?
- A computer program generates random opening moves for its first 100 chess games and records the outcomes of those games. Starting with the 101st game, the computer uses those records to influence its choice of opening moves.

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What is Learning?

- Does this event represent an example of learning?
- A worm is placed in a T-maze. The left arm of the maze is brightly lit and dry; the right arm is dim and moist. On the first 10 trials, the worm turns right 7 times. On the next 10 trials, the worm turns right all 10 times.



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What is Learning?

- Does this event represent an example of learning?
- A previously psychotic patient is given a surgery and no longer exhibits any psychotic behaviors.

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What is Learning?

- Does this event represent an example of learning?
- After 30 years of smoking two packs a day, Zeb throws away his cigarettes and never smokes again.

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What is Learning?

- Does this event represent an example of learning?
- MYCIN is a computer program that does a rather good job of diagnosing human infections by consulting a large database of rules it has been given. If we add another rule to the database, has MYCIN learned something?

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Learning

- Change in an organism's behavior or thought as a result of experience
- Learning is "the process by which experience or practice results in a relatively permanent change in behavior or potential behavior"
- When we learn our brains change along with our behaviors

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Learning

- There are many different kinds of learning
- Habituation and sensitization
- Classical conditioning
- Operant conditioning
- Cognitive models of learning

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Learning

- **Habituation** and **Sensitization**
- **Habituation** is responding to stimuli **less** over time
- **Sensitization** is responding to stimuli **more** over time
- Probably the simplest forms of learning

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Habituation to a Loud Noise



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Lecture Preview

- **Classical conditioning**
- Operant conditioning
- Cognitive models
- Biological influences
- Learning fads

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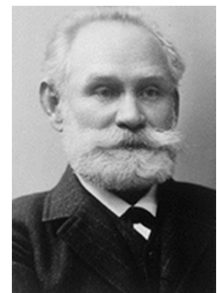
Learning via Association

- A great deal of learning occurs by association one thing with another.
- The *British Associationists* believed that we acquired most of our knowledge via associations
- Simple associations provided the mental building blocks for more complex ideas

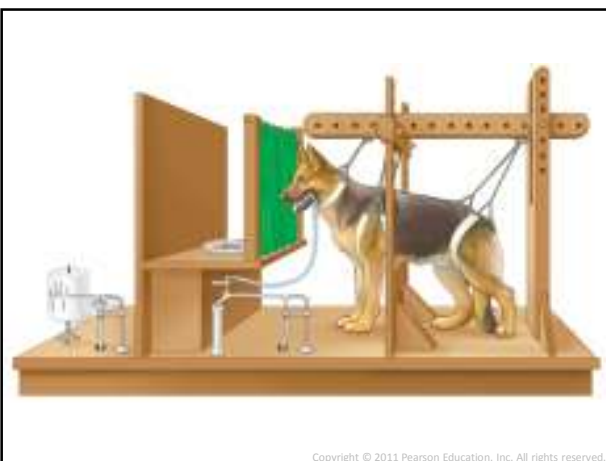
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Ivan Pavlov

- Russian physiologist and 1904 Nobel Prize winner
- Most famous for work on digestion of the dog
- This included the first work on **classical conditioning**
- **Do you know how Pavlov discovered classical conditioning?**

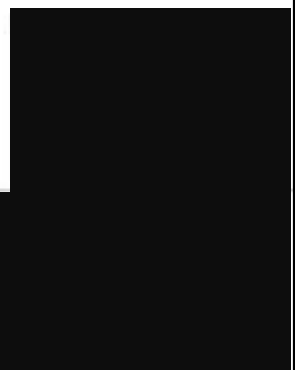
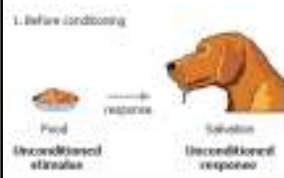


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Classical Conditioning



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Classical Conditioning

- Involves five primary components
 - Neutral stimulus (NS)
 - Unconditioned stimulus (UCS)
 - Unconditioned response (UCR)
 - Conditioned stimulus (CS)
 - Conditioned response (CR)

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Classical Conditioning Steps

1. Start with a neutral stimulus, which does not elicit a particular response
 - Metronome
2. Pair the NS again and again with the **unconditioned stimulus**, which elicits an **unconditioned response**
 - Meat powder and salivation

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Classical Conditioning Steps

3. Eventually, the NS becomes a **conditioned stimulus**, eliciting a **conditioned response**
 - Metronome and salivation
- Classical conditioning is necessary to develop associations between important events in the environment.
 - Helps survival of the organism

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Video

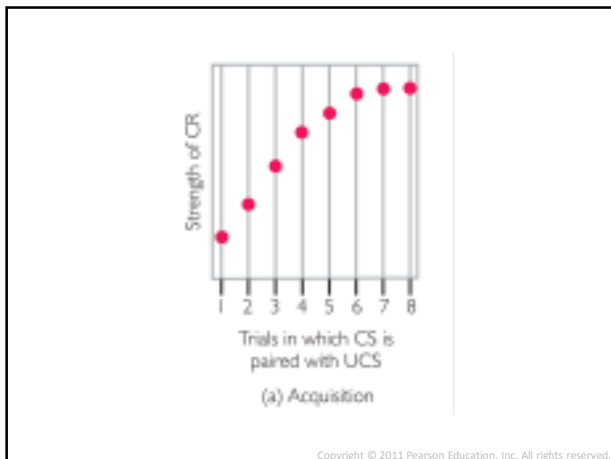
- MultiMedia Library
- **Watch**
- [Classic footage of Pavlov \(p. 202\)](#)
- <http://www.mathxl.com/info/mmlib.aspx?bookcode=Lilienfeld2e>

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Principles of Classical Conditioning

- **Acquisition** is the phase during which a CR is established
- **Acquisition is a form of learning.**

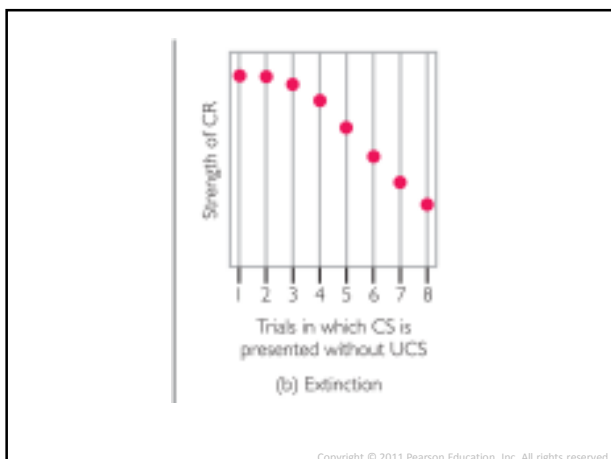
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Principles of Classical Conditioning

- **Extinction** is the reduction and elimination of the CR after the CS is presented repeatedly *without* the UCS

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Principles of Classical Conditioning

- **Extinction** is the reduction and elimination of the CR after the CS is presented repeatedly *without* the UCS

- **Is extinction forgetting or it is a form of learning (new associations)?**

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Principles of Classical Conditioning

- **Spontaneous Recovery**
 - Some time after extinction, CR reappears in a weaker form if we present CS again
- **Renewal Effect**
 - If we extinguish a response in a setting different from the one in which the animal acquired it, and when we restore the animal to the original setting, the extinguished response reappears.

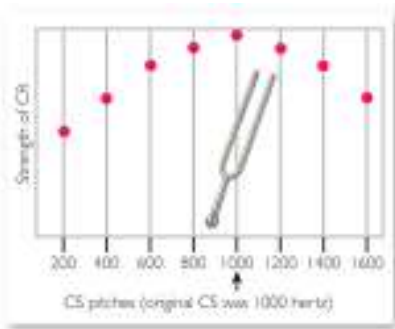
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Principles of Classical Conditioning

- **Stimulus generalization** is when similar CSs elicit a CR
 - Driving a new car

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Figure 6.4 Generalization Gradient. The more similar to the original CS the new CS is (for example, Pavlov using a tone pitched close to the original tone's pitch), the stronger the CR will be.

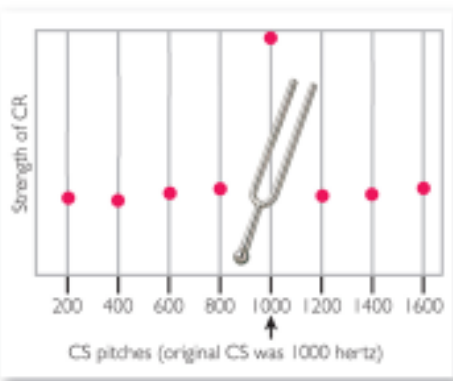


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Principles of Classical Conditioning

- **Stimulus discrimination** is when we exhibit a CR only to certain stimuli, not similar others
 - Movie about tornado vs. tornado in real life

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Principles of Classical Conditioning

- **Stimulus discrimination** is when we exhibit a CR only to certain stimuli, not similar others
 - Movie about tornado vs. tornado in real life
- How to teach stimulus discrimination to an animal in laboratory?
- Why to teach stimulus discrimination to an animal in laboratory?
 - You may want to study just noticeable difference with that animal.

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Higher Order Conditioning

- Process where organisms develop classically conditioned responses to CSs associated with the original CS

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Higher-Order Conditioning

- Pairing a neutral stimulus with a CS confers associative strength upon the neutral stimulus
 - After successful pairing of the tone with food, pairing the tone with a light will result in salivating to the light.
 - Tone → Food
 - Light → Tone
 - Light → Food


Figure 4.4 (p. 139)
 In this example of higher-order conditioning, a metronome is paired with food and becomes a CS1 for salivation, following which a light paired with the metronome becomes a CS2 for salivation.
 (Source: Nairne, 2000.)

Higher Order Conditioning

- CR becomes weaker the farther from the original CS
 - Second order conditioning
 - Third order conditioning
 - Fourth order conditioning (almost impossible)

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Higher Order Conditioning



Higher-order conditioning helps explain the seemingly mysterious "power of suggestion." Merely hearing "Want a Coke?" on a hot summer day can make us feel thirsty.

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Applications of Classical Conditioning

- Advertisers repeatedly pair their products with stimuli that elicit positive emotions



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Applications of Classical Conditioning

- Helps to explain how and why we acquire some fears and phobias
 - Little Albert

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Fear Conditioning: *Little Albert*

- o Watson and Rayner (1920)

Play a loud noise when he interacts with the rat



He generalizes the fear to all white furry objects



Watson and Rayner (1920)

Applications of Classical Conditioning

- Helps to explain how and why we acquire some fears and phobias
 - Little Albert
 - What is US, UR, CS, CR in this example?
- Can also help to treat phobias
 - Little Peter who had a phobia for rabbits.
 - In CC sessions, rabbit was associated with candy
 - Today similar practices are used to eliminate phobias.

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Applications of Classical Conditioning

- Disgust reactions to safe food and drink are acquired very easily



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