

## Learning

PSY 100:  
Foundations of Contemporary  
Psychology

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## Learning

- Monkeys beginning to wash their food before they eat it
- The rituals that athletes perform before/during contests
- Birds learning to flutter their wings in front of motion sensors at a Home Depot in Minnesota so they can get inside to their nests
- Our fears (e.g., dogs, heights, clowns, water)
- Always sitting in the same seat for this class

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## Learning

- **Learning** is any relatively durable change in behavior or knowledge that is due to experience
  - Example: monkeys are not born with the habit of washing their food
- Learning is one of the most fundamental concepts in psychology!
- Learning shapes...
  - Personal habits (e.g., nailbiting)
  - Personality traits (e.g., shyness)
  - Personal preferences (e.g., distaste for formal clothes)
  - Emotional responses (e.g., preference for rap music)

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## Phobias

- A **phobia** is an irrational fear of an object or a situation
  - Amaxophobia: fear of driving or riding in vehicles
  - Brontophobia: fear of storms
  - Claustrophobia: fear of enclosed spaces
  - Coulrophobia: fear of clowns
  - Ergophobia: fear of work
  - Glossophobia: fear of public speaking
  - Hemaphobia: fear of blood
  - Phagophobia: fear of eating
- How do people acquire such fears?
- Most likely these fears were learned through **classical conditioning**

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## Classical Conditioning

- Video
- **Classical Conditioning** is a type of learning in which a stimulus acquires the capacity to evoke a response that was originally evoked by another stimulus
  - Process was first described around 1900 by Ivan Pavlov (a Russian physiologist) who was studying digestion
  - Sometimes referred to as "Pavlovian conditioning"
  - The term "conditioning" comes from Pavlov's determination to discover the "conditions" that produce this kind of learning

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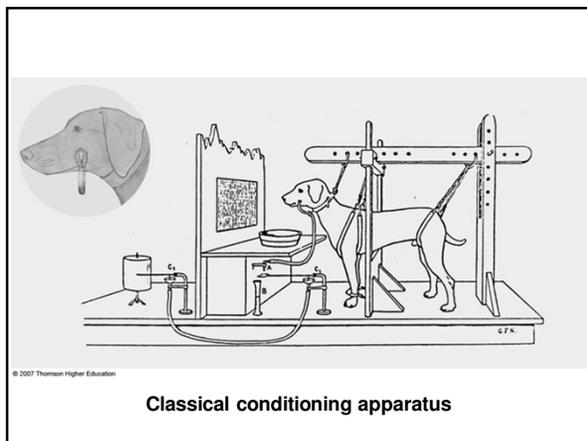
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Classical conditioning apparatus

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### Classical Conditioning

- The important thing to remember about classical conditioning is that neutral stimuli can be changed into stimuli which elicit (or draw forth) certain responses
- Pavlov demonstrated how learned associations were formed by events in the organism's environment

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### Classical Conditioning

- **Unconditioned Stimulus (UCS):** a stimulus that evokes an unconditioned response without previous conditioning
- **Unconditioned Response (UCR):** an unlearned reaction to an unconditioned stimulus that occurs without previous conditioning
- **Conditioned Stimulus (CS):** a previously neutral stimulus that has – through pairing with an unconditioned stimulus – acquired the capacity to evoke a conditioned response
- **Conditioned Response (CR):** a learned reaction to a conditioned stimulus that occurs because of previous conditioning (may be the same as the unconditioned response)

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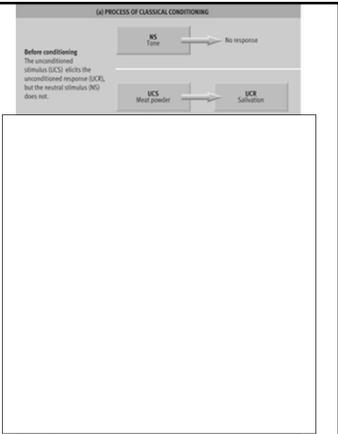
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### The sequence of events in classical conditioning



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## Classical Conditioning and Everyday Life

- Conditioned Fears

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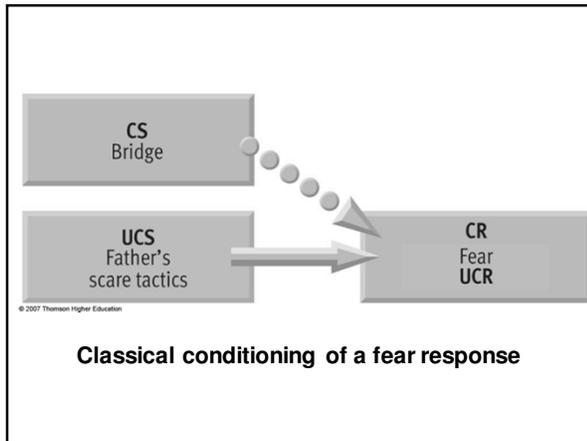
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## Classical Conditioning and Everyday Life

- Conditioned Fears
- Other Conditioned Emotional Responses
  - Advertisers pair their products with attractive people having fun (e.g., beer commercials)



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### Basic Processes in Classical Conditioning

- **Acquisition** is the initial stage of learning something
  - An important aspect of acquisition is **stimulus contiguity** which refers to the UCS and CS occurring together in time and space
  - However, stimulus contiguity does not automatically produce conditioning
- **Extinction** is the gradual weakening and disappearance of a conditioned response tendency
  - A conditioned dog will eventually stop salivating to a tone if no food is presented on repeated trials

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### Basic Processes in Classical Conditioning

- **Spontaneous recovery** is the reappearance of an extinguished response after a period of nonexposure to the CS
  - Ex. Pavlov would extinguish the salivation response of his dogs, then he would find that these dogs would salivate in response to a tone following a break
  - This recovered response is usually weak and tends to fade quickly if the CS is not paired with the UCS

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### Basic Processes in Classical Conditioning

- **Stimulus generalization** occurs when an organism that has learned a response to a specific stimulus responds in the same way to new stimuli that are similar to the original stimulus
  - e.g., A fear of a specific dog may generalize to a fear of all dogs
  - Watson & Rayner (1920): **Little Albert** was an 11-month-old boy who was initially unafraid of a live white rat
    - Then, the researchers would strike a steel gong with a hammer each time the rat was presented to Little Albert (he was afraid of the loud, startling sound)
    - After 7 pairings of the rat with the sound, the rat became a CS eliciting a fear response for Little Albert
    - Little Albert's fear generalized to a number of other white and furry stimuli (e.g., rabbit, dog, Santa Claus mask, Watson's hair)
  - The more similar new stimuli are to the original CS, the greater the generalization

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## Basic Processes in Classical Conditioning

- **Stimulus discrimination** occurs when an organism that has learned a response to a specific stimulus does *not* respond in the same way to new stimuli that are similar to the original stimulus
  - e.g., My dog responds vigorously to the sound of cheese being unwrapped...but does not respond to similar sounds
  - The less similar new stimuli are to the original CS, the greater the likelihood (and ease) of discrimination
- **Higher-Order Conditioning** occurs when a CS functions as if it was an UCS
  - UCS (meat powder) elicits UCR (salivation)
  - Phase 1: CS (tone) + UCS (meat powder) elicits CR (salivation)
  - Phase 2: CS (red light) + CS (tone) elicits CR (salivation)

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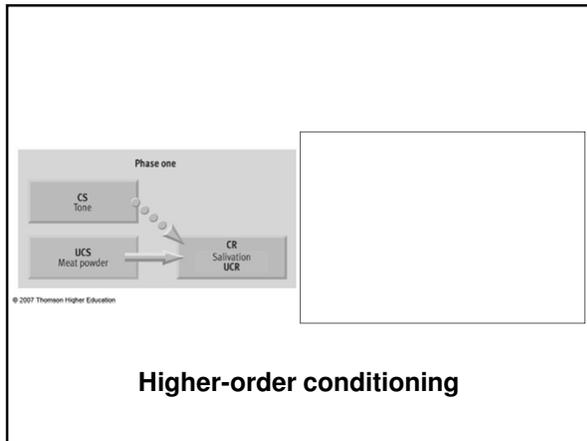
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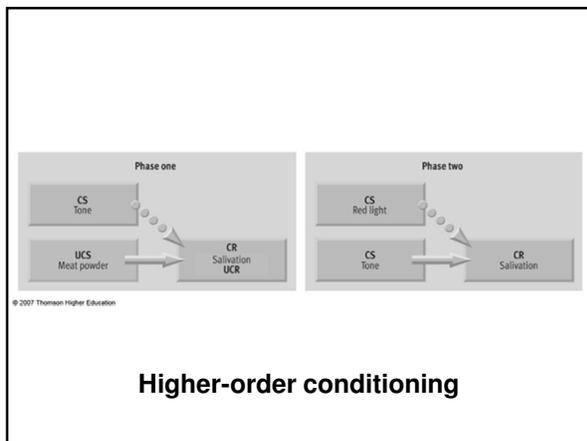
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## Operant Conditioning or Instrumental Learning

- Video
- **Operant conditioning** is a form of learning in which responses come to be controlled by their consequences
- B.F. Skinner demonstrated that organisms tend to repeat those responses that are followed by favorable consequences
- **Reinforcement** occurs when an event following a response increases an organism's tendency to make that response
  - Simple but immensely powerful
  - Much of everyday behavior is driven by reinforcement

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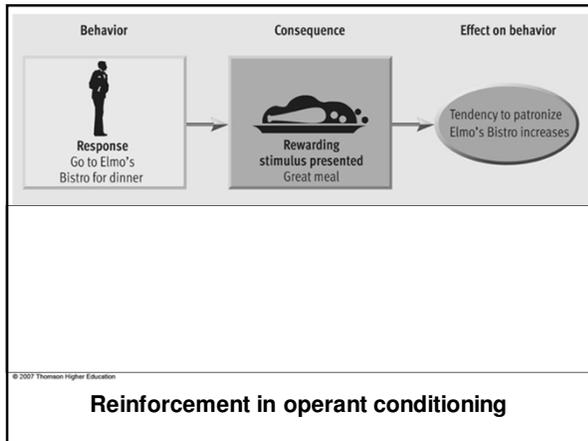
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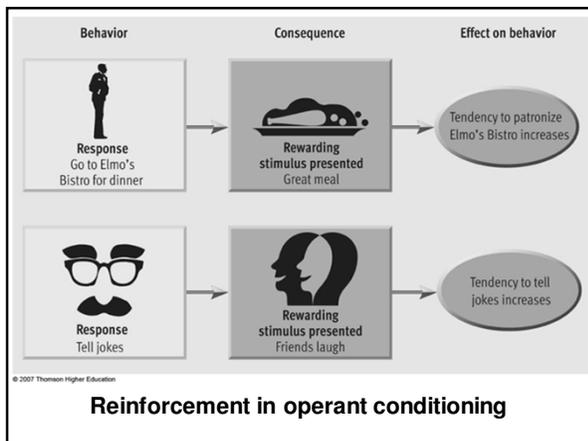
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## Reinforcement in operant conditioning

Positive Reinforcement		
Behavior	Rewarding Stimulus Provided	Future Behavior
You turn in homework on time.	Teacher praises your performance.	You increasingly turn in homework on time.
You wax your skis.	The skis go faster.	You wax your skis the next time you go skiing.
You randomly press a button on the dashboard of a friend's car.	Great music begins to play.	You deliberately press the button again the next time you get into the car.

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## Terminology for Operant Conditioning

- An organism is placed in an **operant chamber** (or “Skinner Box”)
  - An **operant chamber** is a small enclosure in which an animal can make a specific response that is recorded while the consequences of the response are systematically recorded
  - Video
- Operant responses tend to be voluntary so they are said to be **emitted** rather than elicited

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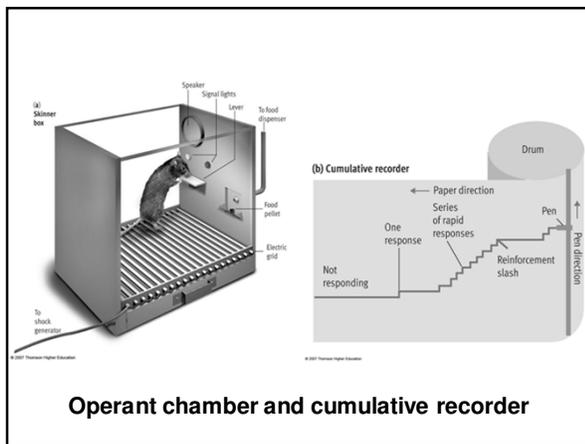
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Operant chamber and cumulative recorder

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## Basic Processes in Operant Conditioning

- **Acquisition:** initial stage of learning that usually involves shaping
  - **Shaping** consists of the reinforcement of closer and closer approximations of a desired response
  - Shaping is used to train animals to perform tricks
- **Extinction** refers to the gradual weakening and disappearance of a response tendency because the response is no longer followed by a reinforcer
  - One factor that influences the rate of extinction is the schedule of reinforcement

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## Schedules of Reinforcement

- A **schedule of reinforcement** determines which occurrences of a specific response result in the presentation of a reinforcer
- **Continuous reinforcement** occurs when every instance of a designated response is reinforced
- **Intermittent (partial) reinforcement** occurs when a designated response is reinforced only some of the time
  - **Ratio schedules**
    - Fixed: reinforcer is given after a fixed number of responses (e.g., piecework at a factory)
    - Variable: reinforcer is given after a variable number of responses (e.g., slot machines)
  - **Interval schedules**
    - Fixed: reinforcer is given for the first response after a fixed amount of time has elapsed (e.g., paycheck every month)
    - Variable: reinforcer is given for the first response after a variable amount of time has elapsed (e.g., surfing)

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## Reinforcement: Consequences that Strengthen Responses

- **Primary Reinforcers** are events that are inherently reinforcing because they satisfy biological needs
  - Examples: food, water, warmth, and sex
- **Secondary Reinforcers** are events that acquire reinforcing qualities by being associated with primary reinforcers
  - These depend upon learning and vary across members of a species
  - Examples: money, good grades, attention, flattery, praise, and applause

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Consequences:  
Reinforcement and Punishment

- **Reinforcement** increases a response
  - **Positive reinforcement:** response followed by addition of a rewarding stimulus (e.g., study hard for your next exam and earn an A)
  - **Negative reinforcement:** response followed by removal of an aversive stimulus (e.g., give in to your child's tantrum to stop the crying)
- **Punishment** decreases a response
  - **Positive punishment:** response followed by addition of an aversive stimulus (e.g., get into a fight in elementary school and get spanked by your father when you get home)
  - **Negative punishment:** response followed by removal of a rewarding stimulus (e.g., earn bad grades in high school and your mother takes away your car)

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Punishment

- Parents should minimize their dependence upon physical punishment
  - However, it is effective when children are too young to understand verbal reprimands or the withdrawal of privileges
- How to make punishment more effective:
  - Apply punishment swiftly
  - Use punishment just severe enough to be effective
  - Make punishment consistent
  - Explain the punishment
  - Use noncorporal punishments (e.g., withdrawal of privileges)

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Observational Learning: Basic Processes

- **Observational learning** occurs when an organism's responding is influenced by the observation of others (who are referred to as **models**)
- **Video**
- 4 key processes
  - **Attention:** you must see the behavior performed
  - **Retention:** you must remember the behavior
  - **Reproduction:** you must be able to reproduce the behavior
  - **Motivation:** you must encounter a situation where you believe the behavior will be rewarded

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