

## Learning 2

### Habituation and its relation to Classical Conditioning - Fear Conditioning (Phobias)

\_\_\_\_\_ occurs when an organism no longer responds to stimuli that have become familiar over time.

- A Assimilation
- B Classical Conditioning
- C Habituation
- D Instrumental Conditioning
- E Shaping

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The most important difference between habituation/dishabituation and conditioning (either classical or instrumental) is that habituation/dishabituation \_\_\_\_\_.

- A. only describes situations in which there is a decline in responsiveness to a stimulus
- B. describes only the responsiveness of an organism to a stimulus not the relationship between events
- C. does not involve a US or UR
- D. only applies to less intelligent organisms

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## Now that your Clickers are out

- Please check if ID on your clicker matches one in the list on the right
- These are all clickers that are being used but have not be registered (or registered correctly)
- You must register to receive credit

#099A8013	#862BC66B
#327E93DF	#8E34AF15
#82970613	#8E7D7685
#837106F4	#8E8588B3
#83C31454	#8E878E87
#83D54F19	#8E8A5753
#84BEBF85	#8E905F41
#84FAAED0	#8E932439
#84FF770C	#8EA70128
#85953525	#8EC983C4
#85F7B0C2	#90C49ECA

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## Elicited Behavior & Habituation

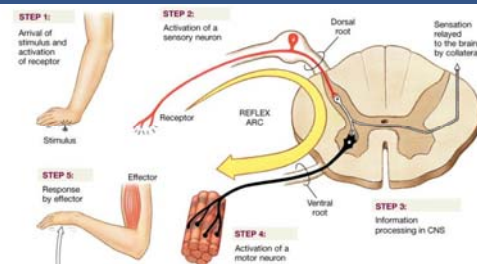
- Is behavior totally flexible or is it subject to constraints set by the organism's genetic history?
  - Empiricism – John Locke
  - Nativism – Rene Descartes (Innatism)
- Elicited behaviors: reflexes and habits

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## Reflex Arc



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## Habituation

### Habituation

The decline in the response to a stimulus once the stimulus has become familiar

### Dishabituation

An increase in responsiveness when something novel is presented, following a series of presentations of something familiar

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Generalization and discrimination of stimuli along a gradient are phenomena applicable in which of the following.

- A Classical Conditioning
- B Habituation
- C Instrumental Conditioning
- D Shaping
- E All of (A)-(D) above.

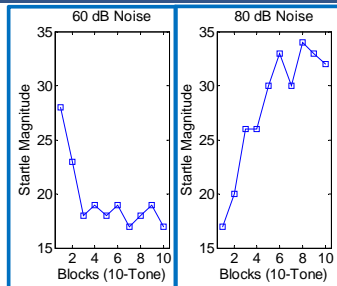
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## Sensitization

- Brief loud tones startle rats
- In a low-noise environment, they habituate quickly
- Loud white noise is arousing
- The arousal from a high-noise environment causes increasing sensitivity to the tones



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## Habituation in Daily Life: CAT Scan Disaster

- LA Times Headline, Oct 14 2009  
Cedars-Sinai investigated for significant radiation overdoses of 206 patients  
*The dosage -- eight times the programmed amount -- appeared on technicians' screens during CT scans. Doctors also missed the problem. Experts say blind trust of medical machinery is a growing concern.*

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## Habituation in Daily Life: Food Consumption

- When people eat the same food during a meal, they begin to respond less to the food. Why?
  - Become satiated ("full")
  - Become habituated to the motivating properties of the food
- Providing variety in a meal increases the amount that is consumed in a meal
- Increased food variety may be a contributing factor to the increase in childhood obesity

Consider these two statements

1. In classical conditioning the schedule of rewards is pre-determined and nothing the animal can do will change it.
2. Instrumental conditioning involves the creation of new voluntary behaviors.

Choose one

- A. Both statements are true
- B. Statement 1 is true but 2 is false
- C. Statement 2 is true but 1 is false
- D. Both statements are false

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## Conditioning and “Causality”

- Organisms are predisposed to learn about contingencies and causal relationships
- Classical and instrumental conditioning can be differentiated as ways of learning about two kinds of causal relationship
  - Classical conditioning allows organisms to learn a causal relationship in the environment and use it predictively
  - Instrumental conditioning allows organisms to learn a causal relationship that they can use it to influence the future

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## Does Classical Conditioning Really Matter for Us?

# FEAR

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## Fear

Fear is the foundation of most governments; but it is so sordid and brutal a passion, and renders men in whose breasts it predominates so stupid and miserable, that Americans will not be likely to approve of any political institution which is founded on it.  
-John Adams, 1776

And for America, there will be no going back to the era before September the 11th, 2001, to false comfort in a dangerous world.  
-George W. Bush, 2003

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If you were to die from one of these threats, which one worries you the most?

Choose one

- A. Being struck by lightning
- B. Terrorism
- C. Automobile accident
- D. Murder
- E. Heart disease

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## Fear is Often not Rational

Frequency for some causes of death 1995 to 2005

Lightning	400
Terrorism	3,200
Weather (tornado, hurricane, flood)	7,000
Murder	180,000
Suicide	300,000
Automobile accident	450,000
Smoking related	1,000,000
Heart disease	6,000,000

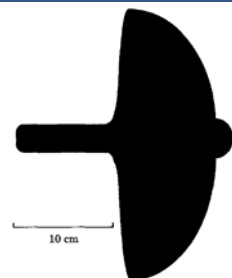
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## Many Fears are “Hardwired”

- Fear is evolution's way of ensuring that animals exhibit proactive responses to life-threatening dangers
- How do we know what to fear?
  - Fears can be innate – coded in the genes
- Lorenz (1939) demonstration that geese have innate fears



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## Fear Conditioning

- Although a useful evolutionary adaptation, genetically encoded fears are inflexible
  - Change is on an evolutionary time scale
- Learning through classical conditioning provides a more flexible mechanism
  - Fear conditioning*

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## Fear Conditioning in the Lab

- Fear conditioning is easily produced in humans
  - shortly after the presentation of a neutral stimulus (CS)
  - brief shock is administered to the forearm (US)
- Fear responses (CR) are associated with *autonomic* changes that can be measured objectively
  - Increased heart rate
  - pupil dilation
  - piloerection (goose bumps)
  - sweating (skin conductance)
- Fear conditioning is easy and robust in many animals

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## Fear Conditioning Does Not Work Equally Well for All Stimuli

- Many species of monkeys, not unlike humans, are very fearful of snakes
- In many monkeys the fear of snakes is not strictly innate or learned
  - rather, it is the *propensity* to learn to fear snakes that is innate
- It is quite easy to teach monkeys to fear snakes but more difficult to teach them to fear something neutral, like flowers



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## Observational Learning can Lead Monkeys to Fear Snakes

- Rhesus monkeys raised in captivity react equivalently to
  - Real snakes
  - Toy snakes
  - "Neutral" stimuli, such as colored wooden blocks
- After watching a videotape of another monkey exhibiting a fearful response to a snake
  - Monkeys show fear of both real and toy snakes
- Monkeys shown videos of a demonstrator monkey reacting fearfully to a neutral object, like a flower
  - Did not become afraid of these objects
- These findings also apply to humans
- Tele-Fear

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## Classical Conditioning can Explain Phobias and Anxiety Disorders

Reference: Mineka, S., & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders: It's not what you thought it was. *American Psychologist*, 61, 10-26.

### Emily

- An independent and outgoing teenager, was with her dog
- when another dog attacked and bit her on the wrist.
- She was terrified but subdued the dog that bit her.
- The painful wound became badly infected and required medical treatment.

### Marian

- A, reserved adolescent, was walking in a field
- when she was terrified by 3 large, growling dogs.
- They chased her to a fence
- One dog tore her pant legs.
- Fortunately, their owner intervened before she was physically injured.

Marian but not Emily developed dog phobia

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## Challenges to the Classical Conditioning Explanation of Phobia

- Many people with phobias do not appear to have had any relevant history of classical conditioning
  - Vicarious (observational) experience can lead to conditioned fears
- Many individuals who do undergo traumatic experiences do not develop phobias
  - Genetic differences in vulnerability to phobias
  - Differences in life experiences

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## Learning Differences: Prior Learning

- Latent inhibition
  - Exposure to a *potential* CS before it and the US are paired reduces the amount of subsequent conditioning if they are paired
- History of control over the environment

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## Learning Differences: Control During a Traumatic Event

- Having control during a traumatic event (such as being able to escape it)

can have a major impact on how much fear is conditioned to CSs paired with that trauma

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## Learning Differences: Post-Event Experiences

- Inflation effect
 

Arousal, even *after* a fear-conditioning event, can increase fearful CRs associated with the CS
- US revaluation
  - Receiving information that the US can be more dangerous than it was perceived to be when it was originally experienced can result in an inflated level of fear to the CS
  - Mental rehearsal

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## Summary: Nuances in the Classical Conditioning Explanation for Phobias

- Vicarious as well as actual experiences may be important
- People differ in their genetic susceptibility to phobias
- Susceptibility depends on life experiences
  - Prior – Latent inhibition / history or mastery
  - During – Sense of control during an incident
  - Afterwards – Inflation effect / US revaluation

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## Looking Ahead

- Reading for Wednesday:
  - Gleitman: Ch. 7, pp. 289-298
- Chapter Test 1
  - Covering Learning
  - is next Wednesday
- Coffee at Phoenix Grill?



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