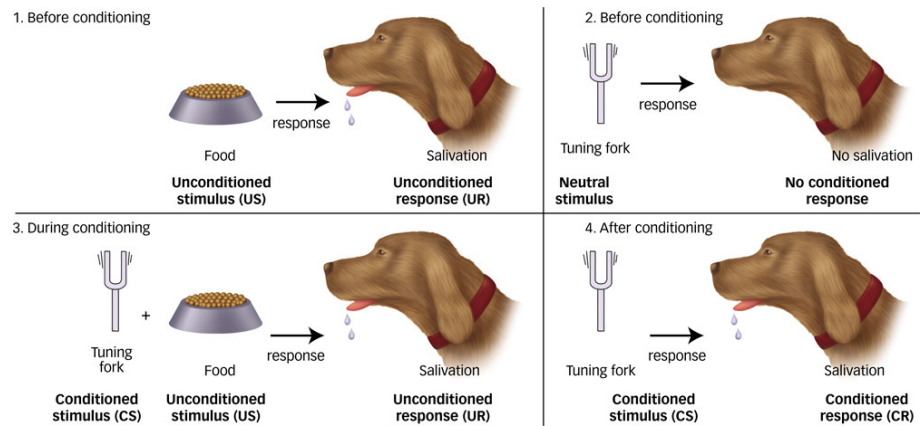


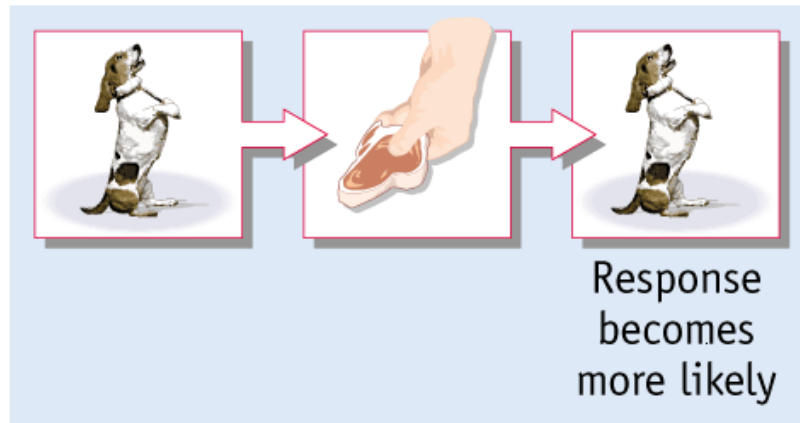
# Learning

There are three types of learning that we cover in this chapter.

## Classical Conditioning



## Operant Conditioning

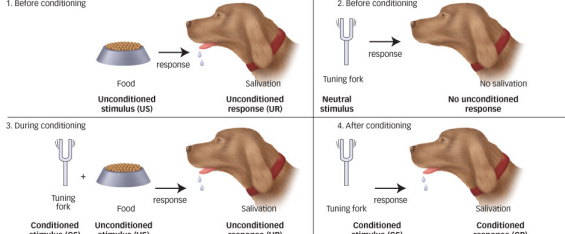
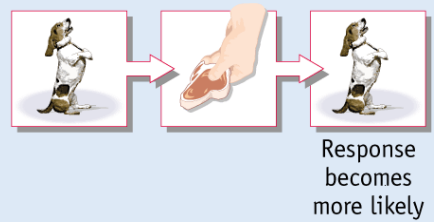



## Observational Learning



## Learning

Learning is the process of learning associations between environmental events and behavioral responses. There are three basic types of learning

<p><b>Classical Conditioning</b></p>	<p>usually involves involuntary responses</p>	
<p><b>Operant Conditioning</b></p>	<p>usually involves voluntary responses</p>	
<p><b>Observational Learning</b></p>	<p>Learning by watching others</p>	

Learning is the process of learning associations between environmental events and behavioral responses. There are three basic types of learning

## **Conditioning**

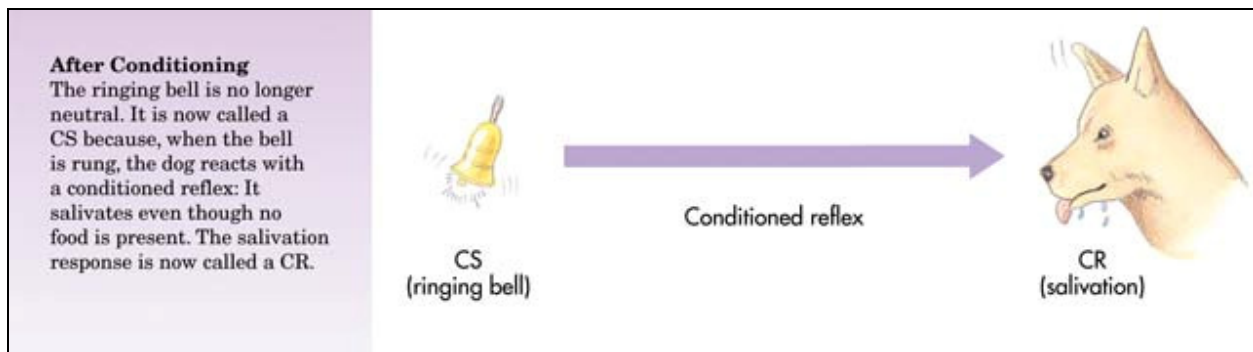
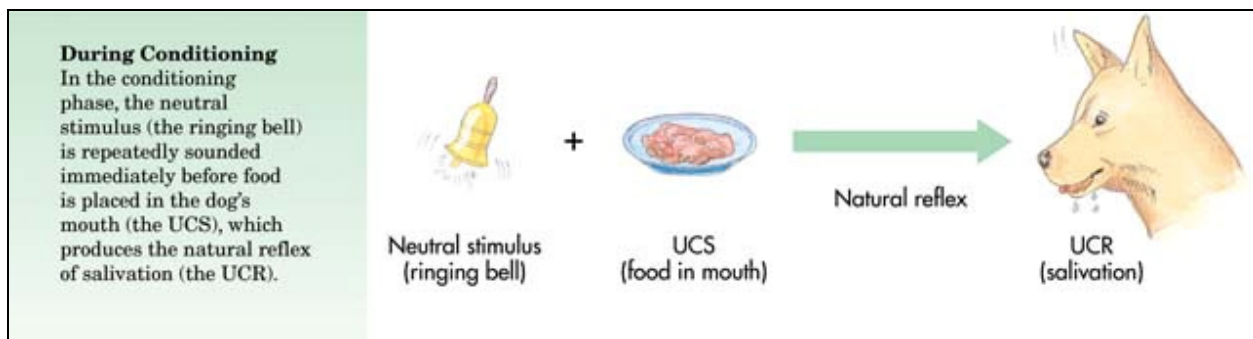
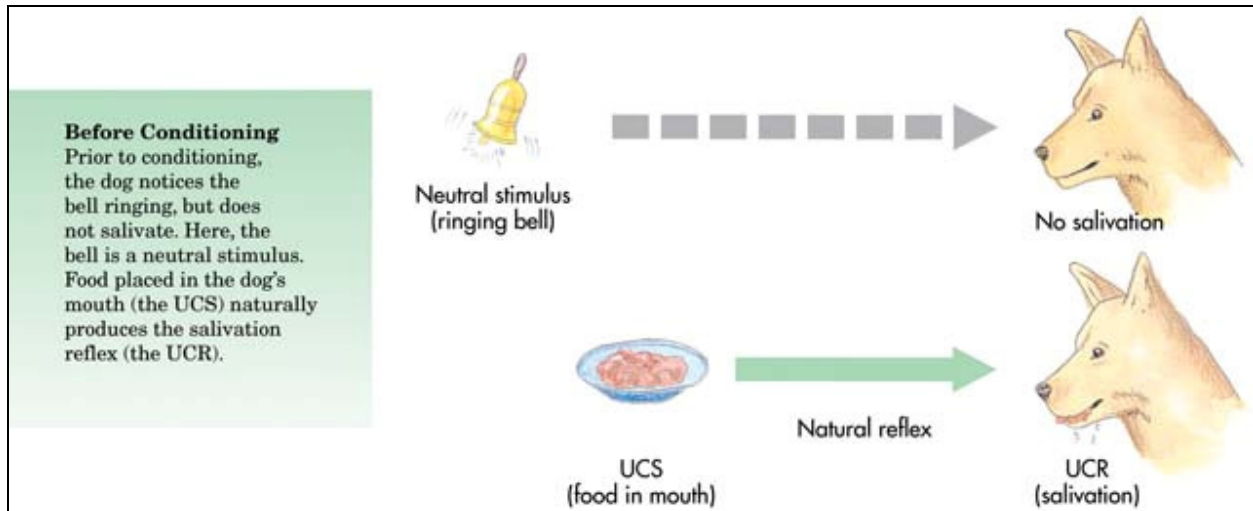
Conditioning (learning) is the process of learning associations between environmental events and behavioral responses.

- Classical conditioning (usually involves involuntary responses such as emotions like fear, anxiety, joy, attraction, disgust)
  - Operant conditioning (usually involves voluntary responses)
- 

### **Classical Conditioning**

Classical Conditioning: When a neutral stimulus evokes a response after being paired with a stimulus that naturally evokes a response.

## Classical Conditioning: Pavlov and the Dogs

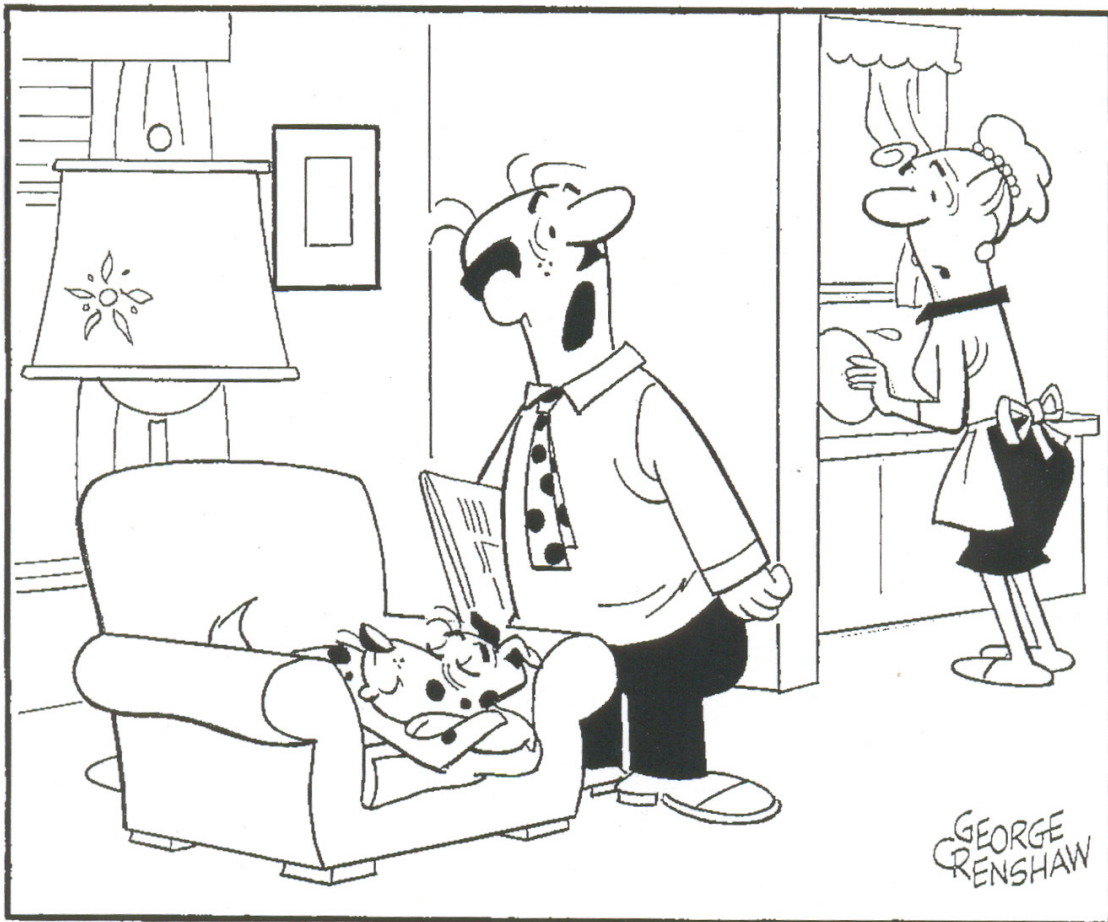


## Classical Conditioning

### FIGURE 5.7

#### *Classical Conditioning: Useful for Practical Purposes*

Classical conditioning has many practical applications.



" GO RUN THE ELECTRIC CAN OPENER SO HE'LL  
GET OFF MY CHAIR. "

(Source: George Crenshaw / Post Dispatch Features.)



## Classical Conditioning



### *In rapt contemplation*

*There is nothing inscrutable about this young tiger cat. Cognitive theorists explain her conditioned response on the basis of expectancy: The sound of the can being attached to the opener permits her to predict the arrival of food.*

## **Elements of Classical Conditioning**

Classical Conditioning: When a neutral stimulus evokes a response after being paired with a stimulus that naturally evokes a response.

Identify the US, UR, neutral stimulus, CS and CR

- (1) Before each of his chemotherapy sessions, Allen, a young cancer patient, is given a bowl of ice cream. The chemotherapy makes Allen nauseated. Now just seeing the bowl of ice cream makes him feel queasy.
  
- (2) Frank loved to swim in the lake near his house. After swimming in the lake one afternoon, he discovered two big slimy, bloodsucking leeches firmly attached to his leg. He was revolted as he pulled the slimy leeches off his leg. Now every time he passes the lake, he shudders in disgust.
  
- (3) Every time two-year-old Jodie heard the doorbell ring she raced to open the front door. On Halloween night, Jodie answered the doorbell and encountered a scary monster with nine flashing eyes. Jodie screamed in fear and ran away. Now Jodie screams and hides whenever the doorbell rings.

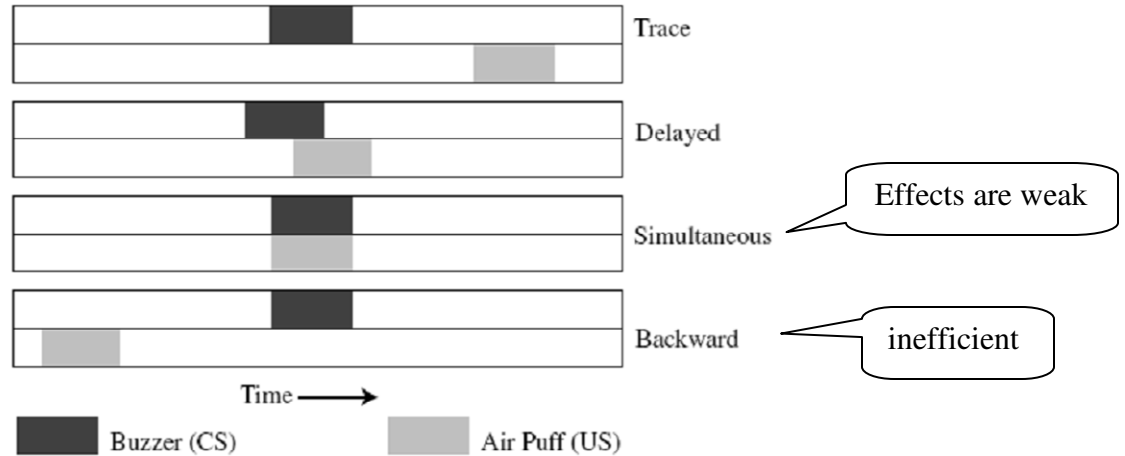
## Examples of Classical Conditioning

<ul style="list-style-type: none"> <li>• Pavlov's dogs</li> </ul>	
<ul style="list-style-type: none"> <li>• Little Albert</li> </ul>	
<ul style="list-style-type: none"> <li>• Advertising</li> </ul>	
<ul style="list-style-type: none"> <li>• "That was easy"</li> </ul>	
<ul style="list-style-type: none"> <li>• Feeling good (the response) when you hear a song (the stimulus) on the radio that is connected to a special time you've had.</li> </ul>	



## Factors that Affect Conditioning

- Pairing of CS and US



*Figure 3-3 Pairing CS and US. A CS may precede, overlap with, occur simultaneously with, or follow a US. See text for explanation.*

- CS-US contingency
- CS-US contiguity
- Stimulus features
- Prior experience with CS and US
- Number of CS-US pairings
- Intertrial interval
- Other variables

## **Factors that Affect Conditioning**

### Pairing of CS and US

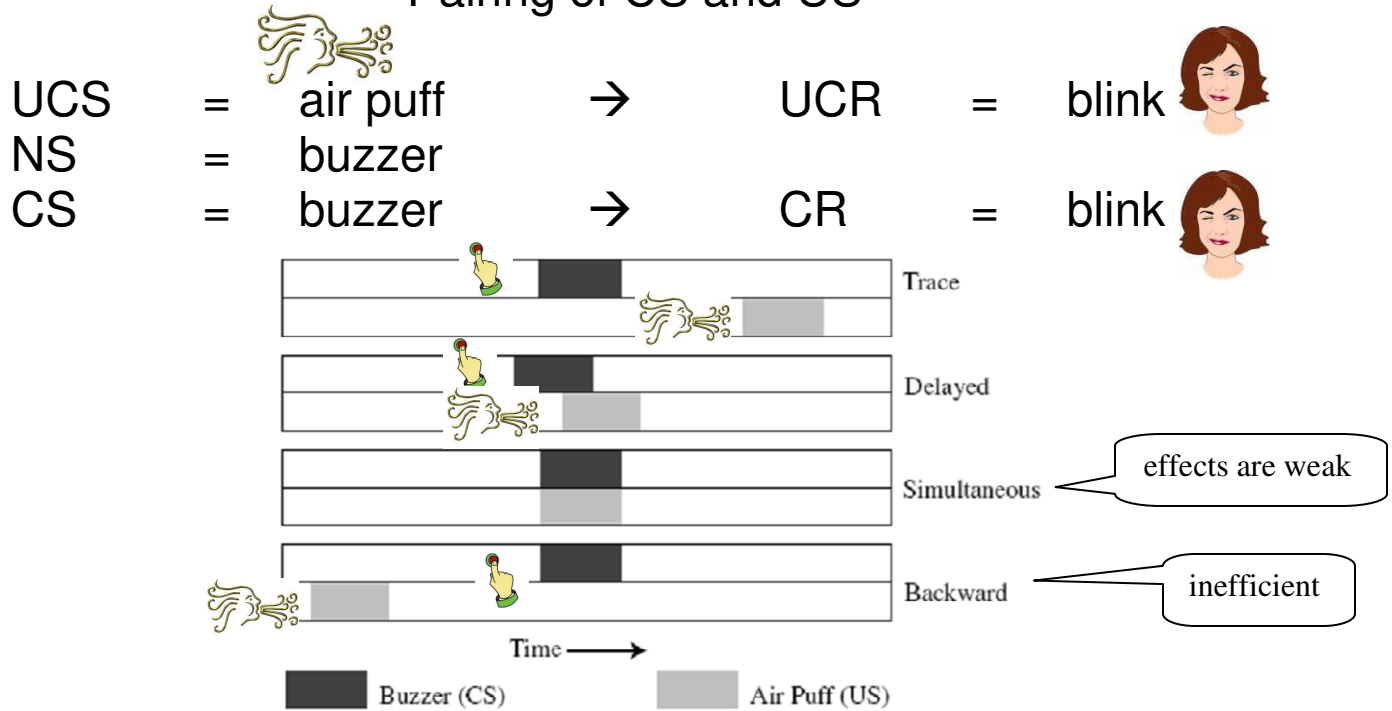
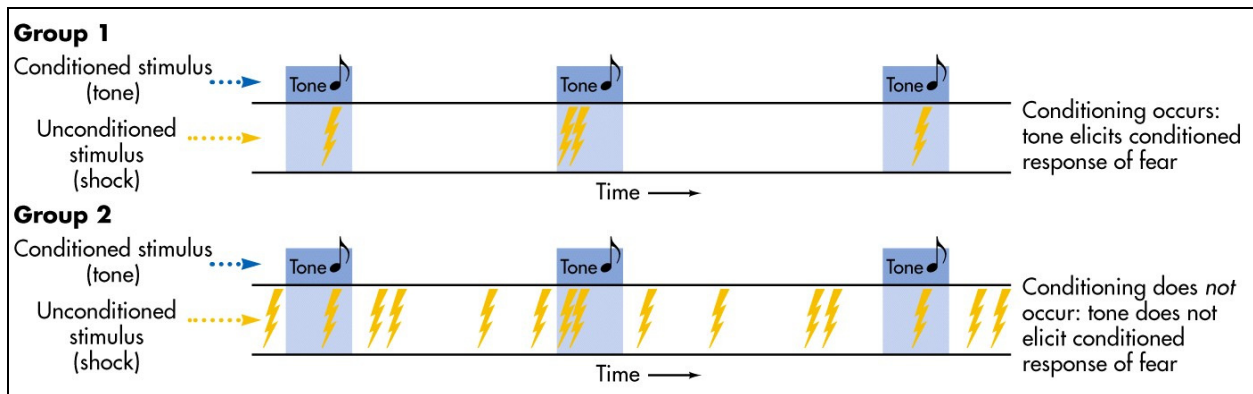


Figure 3-3 Pairing CS and US. A CS may precede, overlap with, occur simultaneously with, or follow a US. See text for explanation.

- **Trace conditioning:** The signal (CS) precedes the UCS.
  - Lightning signals the sound of thunder.
- **Delayed conditioning:** The signal (CS) overlap. The UCS appears before the CS ends
  - The dog growls (the signal) as it bites
- **Simultaneous conditioning:** The signal (CS) and the UCS occur at the same time. Classical conditioning is difficult under this condition.
- **Backward conditioning:** The signal (CS) follows the UCS. Classical conditioning is very difficult under this condition.
  - Sitting on a splinter (UCR) and then jumping (UR) and seeing the roughly hewn bench (CS)

## Factors that Affect Conditioning CS-US contingency

A contingency is a kind of if-then statement. One event, Y is contingent on another event, X, to the extent that Y occurs if and only if X occurs (page 71). In other words, is there consistency and predictability of the signal.



X = tone

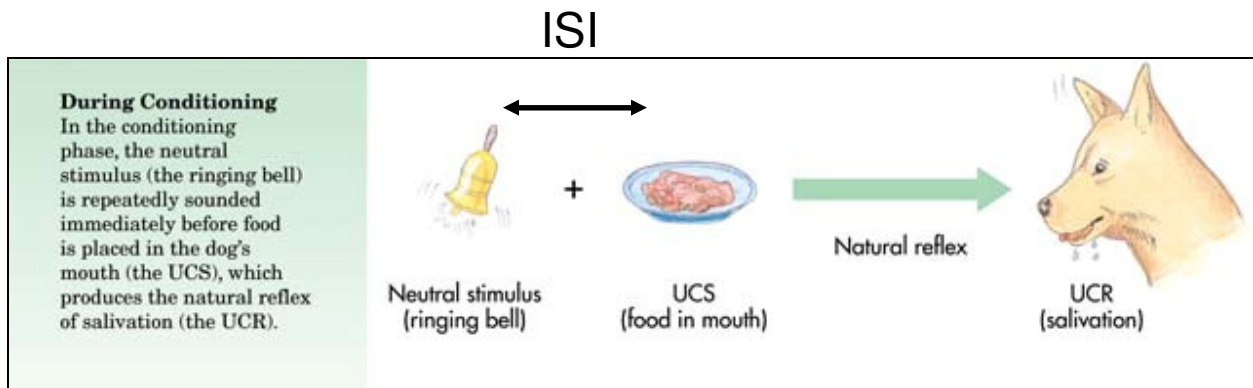
Y = electric shock

Group 1: The tone is a more reliable predictor (reliable signal) of the electric shock. Because of this, conditioning (learning the association) is more likely to occur than in Group 2.

## Factors that Affect Conditioning CS-US contiguity

Contiguity refers to the closeness in time or space between two events. In Pavlovian conditioning, contiguity refers to the interval between the CS and the US. This interval is called the interstimulus interval or ISI ([page 72](#)).

In the case of Pavlov and the dogs, the ISI is time between when the bell is rung and the food is presented.



In general, the shorter the interval between the CS (or NS in this notation), and the UCS, the more quickly the conditioning occurs, with the exception of the simultaneous procedure where there is no interval.

The time span of this interval can depend on the stimulus features. Some responses are easier to condition than others. Some responses, as with taste aversions, can occur hours apart.



## Factors that Affect Conditioning

### Stimulus features

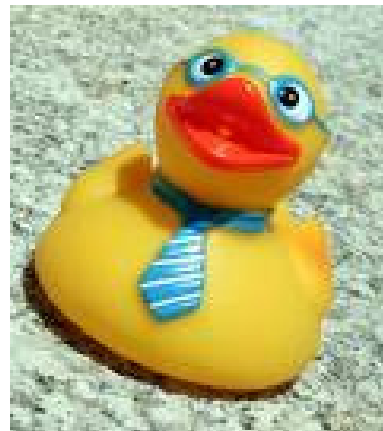
The physical features of the CS and US affect the pace of conditioning ([page 73](#)). Not all neutral stimuli are created equal. Some are easier condition and neutral stimulus to a conditioned stimulus.

Evolutionary perspective  
(biological preparedness):

We are biologically more likely to become afraid of objects that have posed a threat to previous generations (eg. snakes, spiders, heights, drowning, etc.)

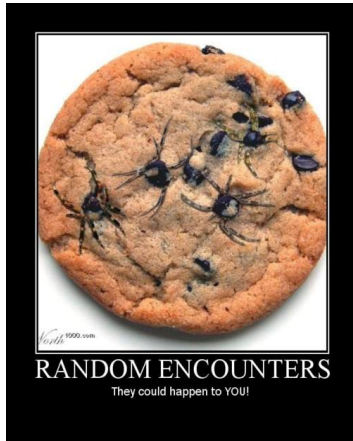


vs.



In addition, intensity of the UCS (louder noises, stronger flavors, stronger electric shocks) influences the conditioning process.

# Biological Preparedness

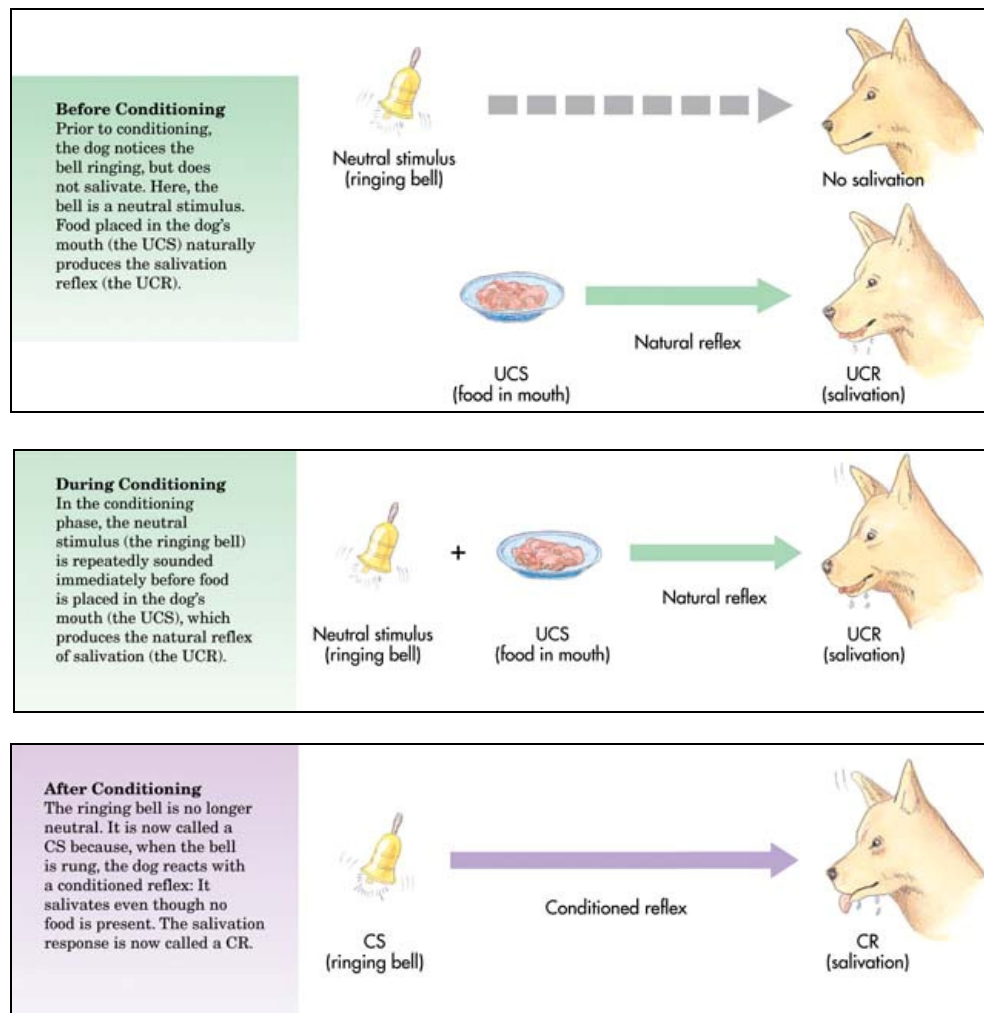


## Factors that Affect Conditioning

### Prior experience with CS and US

The effects of conditioning will depend on the participant's prior exposure to the stimuli that serve as a NS and UCS.

If a dog has heard a bell before, it takes longer than dogs that have not heard bells before for it to become a CS.

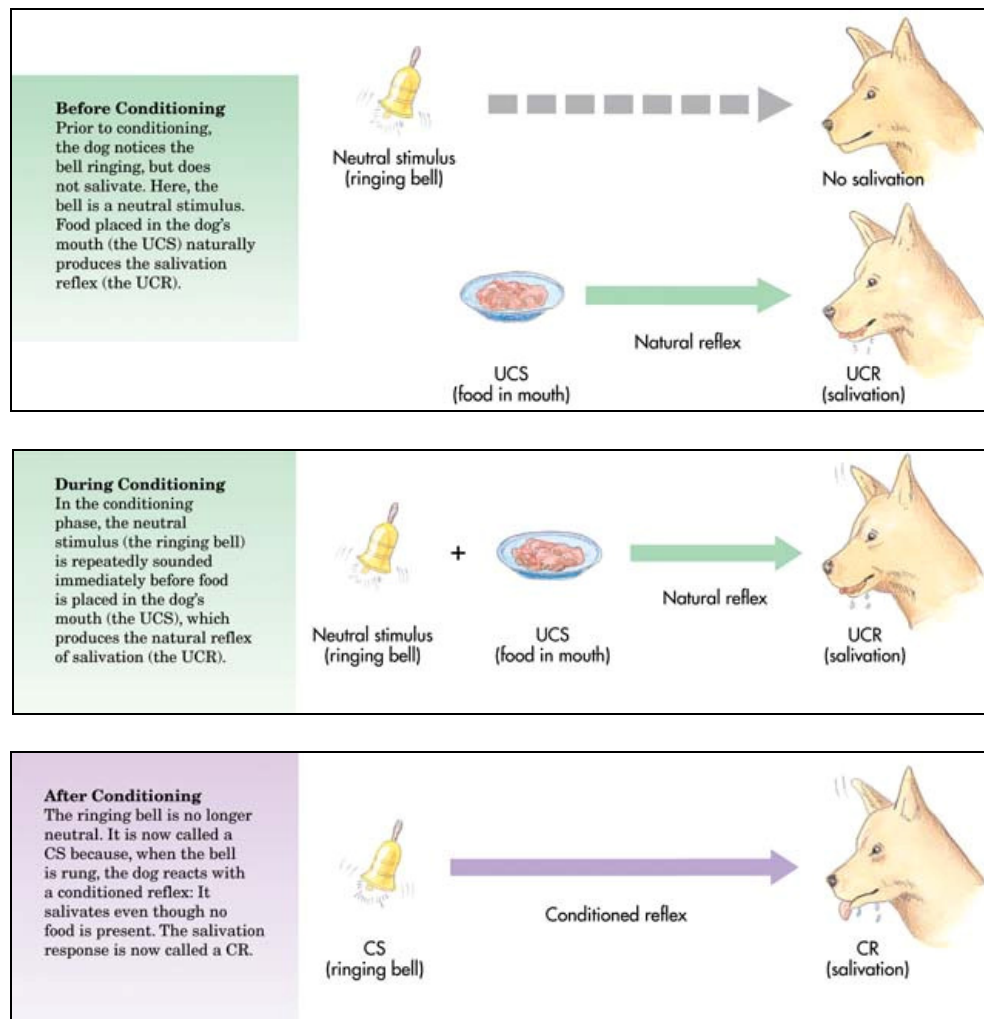


Therefore, novel stimuli may be more successful at becoming a CS. Part of this may be that the NS has been paired with nothing in particular and doesn't signal anything.

## Factors that Affect Conditioning

### Number of CS-US pairings

In general, the number of pairings between the CS and US (or NS and UCS-UCR) increases the likelihood that conditioning will occur.



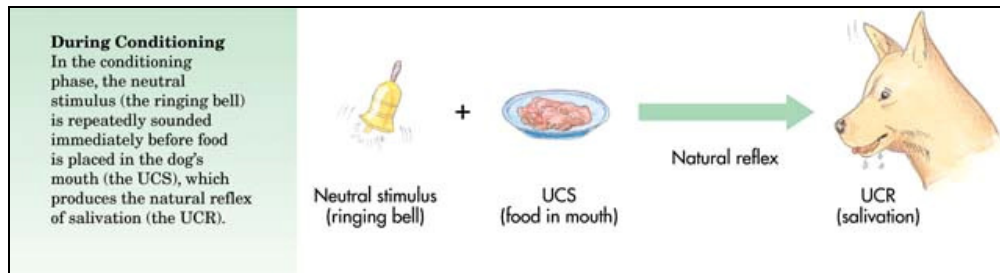
The more often you ring the bell with the presentation of the food, you are more likely to condition the dog to drool at the sound of the bell.



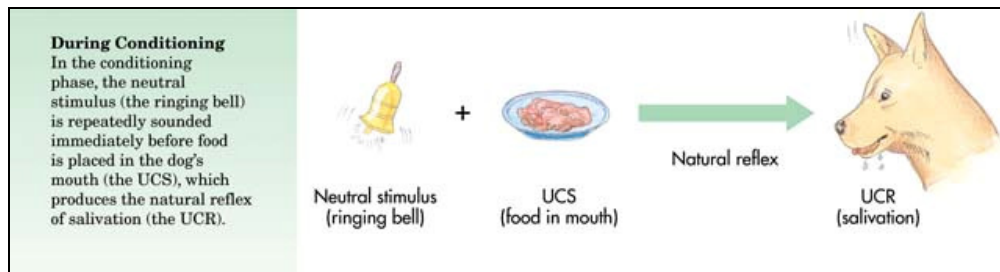
## Factors that Affect Conditioning

### Intertrial interval

The time between trials can affect the process of classical conditioning.



Intertrial interval is the time between these two pairings of the bell and neutral stimulus



## **Factors that Affect Conditioning**

### Other variables

- Age: Those that are older have a more difficult time to classically condition with the eyeblink response.
- Temperament: Dogs that were more excitable learned faster in classical conditioning procedures
- Stress: Stress seems to facilitate acquiring classically conditioned responses