

PSYC 337 LEARNING

Session 4 – Classical Conditioning II

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Session Overview

- This session continues with discussions of the previous session: Classical conditioning.
- It focusses on factors affecting Classical Conditioning, and how to take note of these factors in situations where there is the need to apply the principles.
- In this session, attention will also be focused on the application of Classical Conditioning, and how this can be useful everyday living

Session Objectives

- At the end of the session, the student will be able to
 - Understand factors affecting Classical Conditioning
 - Explain Factors affecting Classical Conditioning
 - Explain how to apply Classical Conditioning Principles in human situations



Session Outline

- The key topics to be covered in the session are as follows:
 - Topic One : Factors affecting Classical Conditioning I
 - Topic Two: Factors affecting Classical Conditioning II
 - Topic Three: Application of Classical Conditioning Principles to Humans

Reading List

- Relevant text/chapters and reading materials are available on Sakai

Topic One

FACTORS AFFECTING CLASSICAL CONDITIONING I



Factors affecting Classical Conditioning I

1. The role of Contiguity

- The CS and the UCS should be closer to bring a stronger association between them
- Pairing the CS and the UCS actually means that the CS begins a short time before the UCS
- The idea is that the presentations of the two stimuli have to be contiguous or close together in time in order to become associated

Factors affecting Classical Conditioning I

- The role of contiguity thus raises two important questions:
 1. Does the sequences of stimuli matter?
 - i.e., should the CS be presented first at all time, before the UCS is presented or vice versa?
 2. How close is close enough
 - what should be the time interval between the presentation of the CS and the UCS?

Factors affecting Classical Conditioning I

Different types of temporary relationships:

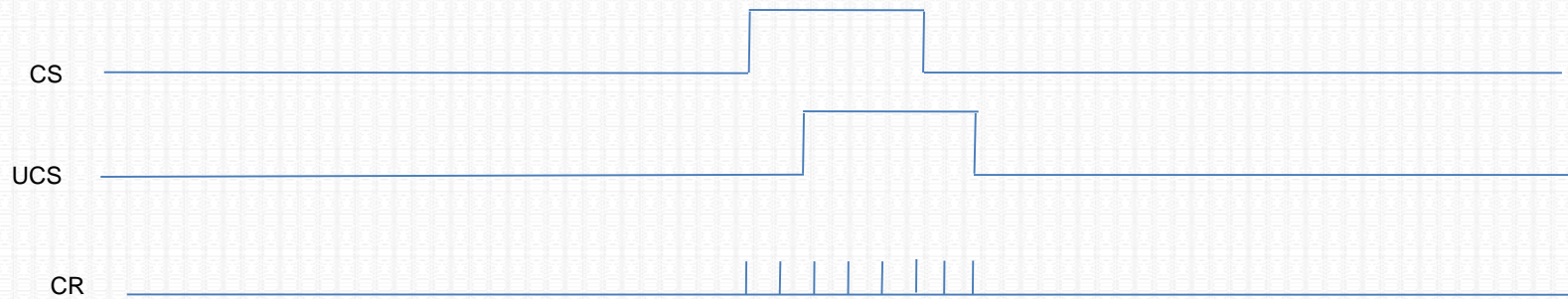
- A. Forward pairing**
- B. Delayed conditioning**
- C. Simultaneous conditioning**
- D. Backwards conditioning**
- E. Trace conditioning**
- F. Temporal conditioning**

Factors affecting Classical Conditioning I

A. Forward Pairing

- With this, the onset of the CS precedes the onset of the UCS
 - The CS is presented before the UCS and it stays on during the presentation of the UCS
- It is the usual Pavlovian experiment where the CS is given, followed closely by the UCS with a time interval of about 0.5 of a second.
- Classical conditioning works best with this arrangement

Factors affecting Classical Conditioning I



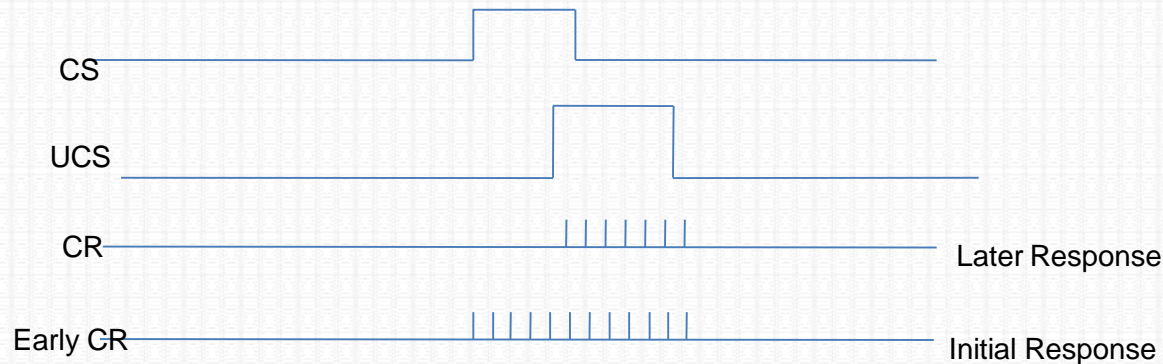
- Note: The CS is presented first, followed by the UCS and it remains until both are taken off at the same time
- So the dog begins to salivate when the CS is presented

Factors affecting Classical Conditioning I

B. Delayed Conditioning

- This is where the interval between the presentations of the CS and the UCS is quite long
 - i.e., a delay in the time interval between the onset of the CS and the onset of the UCS
- Though a CR can be produced, the pattern is temporal

Factors affecting Classical Conditioning I

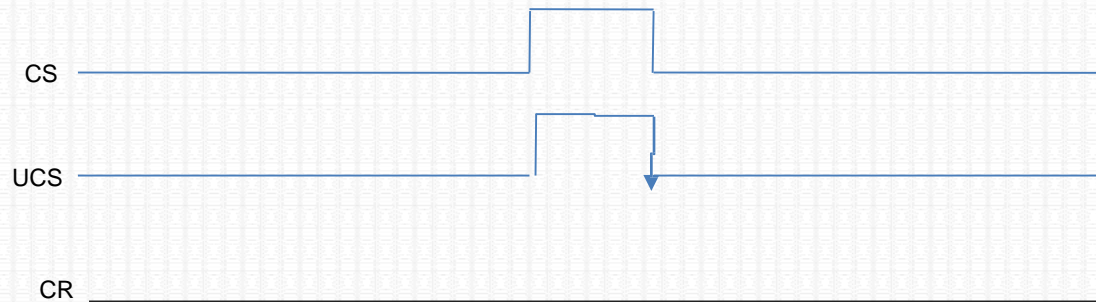


- Initially, the CR comes right at the beginning of the CS and continues with the onset of the UCS
- But with time, the dog realizes that the UCS does not follow the CS immediately
- As a result the temporal pattern of the CR changes
- It does not come immediately after the CS
- Rather, it begins to occur about midway through the CS and increases in frequency until the trial is ended.

Factors affecting Classical Conditioning I

C. Simultaneous Conditioning

- The CS and UCS have onset at the same time because they are both presented together at once
- This means that the onset and offset of the CS and UCS are the same time



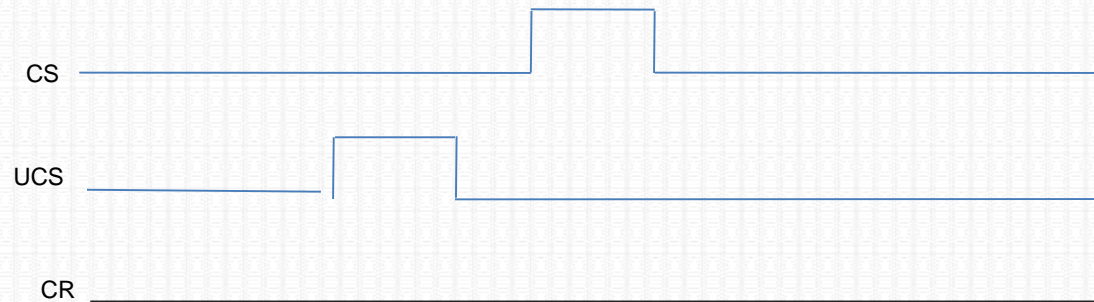
Factors affecting Classical Conditioning I

D. Backward Conditioning

- The UCS is first presented and taken off, followed by the presentation of the CS
- So the CS follows the UCS
- The onset and offset of the UCS comes before the occurrence of the CS
- Instead of the CS predicting the occurrence of the UCS it rather serves as a signal that the UCS has ended.
- There is almost no conditioning with this procedure.
- If a CR is produced, it is not as strong or enduring as in forward conditioning

Factors affecting Classical Conditioning I

An example of backward conditioning



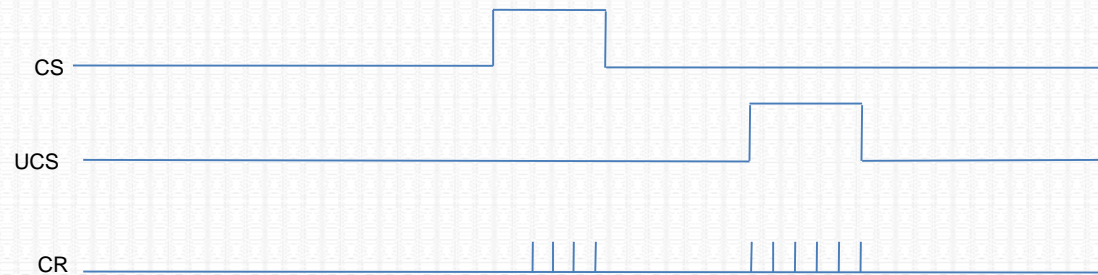
Factors affecting Classical Conditioning I

E. Trace Conditioning

- The onset and offset of the CS occurs some time before the UCS is presented
- The CS comes on and off
- That is, it ceases before the arrival of the UCS, making it more difficult for a CR to be formed
- If a CR is formed at all, it is weak and unstable

Factors affecting Classical Conditioning I

- An example of trace conditioning

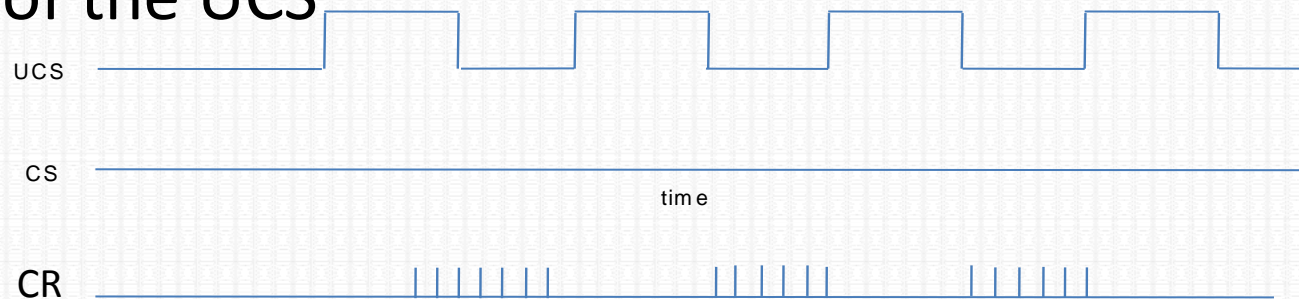


- Note that initially a weak CR is formed when the CS is presented,
- But the rate of the response is high as the meat powder is presented
- With time the dog will salivate only when the UCS is presented
- The time between the presentation of the CS and the UCS is called trace interval

Factors affecting Classical Conditioning I

F. Temporal Conditioning

- In this kind of conditioning no CS is presented
- Rather, the UCS is presented repeatedly with a constant time interval between presentations
- After some time, the organism comes to produce a CR just before each occurrence of the UCS



Factors affecting Classical Conditioning I

2. CS-UCS Relevance (Signal Strength)

- The type of CS and UCS has a major impact on conditioning.
 - Some UCSs produce faster conditioning than others.
 - E.g., a shock delivered to the feet of an organism may produce conditioning faster than a puff of air to the eye.
- The more noticeable a CS is, the faster the rate of conditioning.
 - E.g., An intense stimulus such as a loud tone is more noticeable than a less intense stimulus such as a soft one.

Topic Two

FACTORS AFFECTING CLASSICAL CONDITIONING II



Factors affecting Classical Conditioning II

Attention

- Classical conditioning can also be affected by how much attention an organism pays to stimuli
- Some organisms will be more attentive to stimuli affecting some sense modalities than others
- E.g., Human beings tend to notice visual stimuli more than auditory ones
- Rats are good at auditory stimuli and pigeons are good at pecking.

Factors affecting Classical Conditioning II

Prior Exposures:

- Previous exposure to a NS by itself before pairing it with the UCS may inhibit new learning of an association between the CS and the UCS.
 - Previous experience in which a neutral stimulus occurred without the UCS reduces the likelihood of the stimulus being conditioned when the UCS is presented later
- This means that the organism becomes familiar with the CS and therefore respond to it in a particular way
- As a result, conditioning the organism to respond to this same CS in a different way (pairing the CS and UCS to produce a CR) becomes difficult.
- E.g., If a child is exposed to a dog as his pet, pairing the presence of the dog with a loud noise to get the child to be afraid of the dog may be affected by this prior expose.
 - Several trials of pairing is required to do that

Factors affecting Classical Conditioning II

Compound CSs

- When multiple CSs are available, conditioning may be divided
 - In essence, when two or more CSs are paired with the UCS each may become conditioned but to varying degrees.
- E.g., a tone and light are presented together followed by the meat powder.
- After the tone and light compound come to elicit a CR, conditioning to each stimulus when assessed separately sometimes shows a weaker CR conditioning to each of the stimuli alone than to the compound (the two presented together).

Factors affecting Classical Conditioning II

Contingency (Predictability)

- It is the predictability of the occurrence of one stimulus from the presence of another.
- In other words, it is the reliability of the CS in predicting the occurrence of the UCS.
- Classical conditioning occurs only when the CS provides some information ahead of time about the likelihood of the UCS occurring.
- The occurrence of the UCS must be contingent on the presentation of the CS.
- Therefore, contingency makes the CS more meaningful to the learner.
- For instance a flash of lightening is usually followed by the sound of thunder, thus you will dodge or cover your head or ears when there is lightening in anticipation of the thunder

Factors affecting Classical Conditioning II

- **Information**
- How the CS predicts the onset of UCS is very important.
 - Studies have shown that a learner will form a CS-UCS connection only if the CS can provide unique information about the UCS.
- For example, for fire, the sight of smoke and smell of smoke provides information about fire
- But the smell of smoke is still more informative than the sight of smoke
- This is because, most often, you smell smoke before you even see where it is coming from

Factors affecting Classical Conditioning II

Biological Influences

- The nature of stimuli can influence the conditioning as well
- Biological factors can limit the capacity for conditioning
- An example of biological influences on conditioning is *taste aversion*
- Learned taste-aversion (aversion to a particular taste is conditioned by pairing the taste (CS) with nausea (UCS))

Factors affecting Classical Conditioning II

Belongingness

- In classical conditioning, not all associations are readily learned
- If a CS and UCS are seen as belonging together by an organism, this will aid conditioning
- There is evidence that an association between two stimuli is readily formed if the items somehow belong together (Gleitman, 1995)
- Studies have shown that certain CSs are more readily related to certain UCSs than to others
 - This is because animals have a build-in predisposition (sometimes called preparedness) for certain associations rather than others (Gleitman, 1995)

Topic Three

APPLICATION OF CLASSICAL CONDITIONING PRINCIPLES TO HUMANS



Application of Classical Conditioning Principles to Humans

- Classical conditioning principles can be applied to many domains of human behaviour.
- It helps animals and humans predict what is going to happen in a given situation
 - and provides information that may be helpful to their survival.
- E.g., Learning through classical conditioning may aid animals in finding food or help humans avoid pain or injury.
- According to Vernoy (1995), classical conditioning has a great deal of survival value for the individual.
- For example because of classical conditioning
 - we run when we encounter a fearful animal
 - we wake up to the sound of an alarm clock etc.

Application of Classical Conditioning Principles to Humans

The Conditioning theory of Phobia

- Psychologists can offer a variety of explanations as to where fears come from
- A phobia refers to an excessive and intense fear usually of a specific object or situation, such as a fear of snakes etc
 - E.g., reactions to certain stimuli such as loud noises, sudden movement, or of certain animals
- Classical conditioning theory of phobia states that
 - an initial neutral stimulus becomes phobic because it has been paired with an aversive stimulus; something traumatic, painful or frightening

Application of Classical Conditioning Principles to Humans

Weaning a Child from breastfeeding

- Classical conditioning can also be used to stop babies or toddlers from breastfeeding
- A mother puts a bitter substance (something that is not harmful to the child) around her nipple to prevent a child from sucking
 - Subsequently, anytime the child tries to breastfeed, he/she will taste the bitter substance
- Eventually the child will come to associate bitterness with breast milk and hence stop breastfeeding

Application of Classical Conditioning Principles to Humans

Use of Classical Conditioning by Advertisers

- In the business and social world, classical conditioning has been extensively used.
- The idea here is to associate whichever product/service that is being advertised with something/someone pleasant or attractive in order to entice people to buy these products
- The approach is to link an attractive UCS with a CS (the product being sold/service being rendered), so the consumer will feel positively toward the product just like they do with the UCS
 - E.g., adverts about Beta Malt which is associated with energy and power

Application of Classical Conditioning Principles to Humans

Use of Classical Conditioning by the Police

- Police Visibility: E.g., empty police vehicle, motor-cycles, etc
 - Sometimes elicits good driving behaviour in drivers and other road users
- For example, your heart will pound when you are driving and come across a police vehicle by the road side
 - You associate this with a policeman around, and so you are likely to adjust and behave appropriately