



## Classical Conditioning

This Factsheet describes and evaluates **classical conditioning**.



### A. What is conditioning?

- Conditioning means learning.
- Conditioning is the focus of behaviourism (also known as the learning approach, behavioural analysis, and behavioural psychology).
- Behaviourism proposes that we learn (are conditioned) in two ways.
  1. We learn by associating one thing with another thing (that two things go together) - classical conditioning.
  2. We learn by the consequences of what we do (the effect of our behaviour) - operant conditioning.
- In this factsheet, we focus on classical conditioning. Text box 1 explains how this differs from operant conditioning.

### 1. What is the difference between classical conditioning and operant conditioning?

Classical conditioning involves *involuntary* behaviours (e.g., salivation) whereas operant conditioning involves *voluntary* behaviours. Classical conditioning concerns the association between stimuli and responses whereas operant conditioning uses reinforcement. Factsheet 17 describes operant conditioning.

### B. What is classical conditioning?

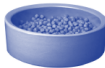


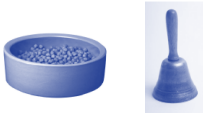



The nature (basic principles) of classical conditioning:

Classical conditioning occurs when we learn that two things happen together – we associate them with each other. Pavlov introduced the concept of classical conditioning (see text box 2). Classical conditioning links an existing, normally reflex (involuntary) action with a new stimulus. That is, we build an association between a neutral stimulus and an existing unconditioned stimulus. Table 1 explains how classical conditioning works.



**Exam hint:** The examiners state that many students do not know the difference between the two types of conditioning and so get them mixed-up in the exam. If the question asks for just classical conditioning or just operant conditioning, make sure that you are talking about the one asked for. Describing the wrong one will not get any marks.

**Table 1. The stages of classical conditioning**

Stage	Stimulus	Response
1. Before conditioning	Food = unconditioned stimulus (UCS). 	Dog salivates = unconditioned response (UCR). This is the normal expected response. 
2. Before conditioning	Bell = neutral stimulus (NS) (it has no effect yet). 	Dog does <i>not</i> salivate = there is no conditioned response.
3. During conditioning		Dog salivates = unconditioned response (UCR). 
4. After conditioning	Bell = conditioned stimulus (CS). 	Dog salivates = conditioned response (CR). 

! Note that the bell is the neutral stimulus before conditioning but is the conditioned stimulus afterwards.

**Exam Hint:** Can you explain what the UCS, UCR, NS, CS and CR are?

### C. Key terms in classical conditioning

#### Order of presentation

The UCS (e.g., food) and CS (e.g., bell) are not always presented at the same time. Variations of presentation (also called timing/contiguities) include:

- Forward/delayed conditioning** = The NS is presented before the UCS (but is still present when UCS presented) (e.g., bell is presented first and remains while food is presented).
- Trace conditioning** = The NS is presented before the UCS, but stops before the UCS is presented.
- Simultaneous conditioning** = The NS and UCS are presented simultaneously (as in table 1).
- Backwards conditioning** = The NS comes after the UCS.

**Exam Hint:** Make sure that you can explain the key terms which are underlined. You will need to know them for the exam.

#### Extinction

If the CS (e.g., bell) is presented many times without the UCS (i.e., without the food), the CR (e.g., salivation) declines and eventually disappears over time. It is necessary to occasionally make the link again between the NS and the UCS in order to maintain a response, otherwise it will become extinct.

#### Spontaneous recovery

This is where a response which has been extinguished for a long time suddenly reappears.

#### Stimulus generalisation

If the stimulus is sufficiently alike to another new stimulus, the new one can trigger the CR. It is then said to be generalised. For example, a bell of a lower tone than the original one used in conditioning can cause the same response.

### D. Examples of classical conditioning in humans and non-human animals

- Phobias can arise from the pairing of a certain stimulus with a fear response (e.g., Watson and Rayner (1920) classically conditioned Little Albert to have a phobia of rats).



- Smelling a particular odour can bring back memories of a person/place.

- Taste aversion is where the taste of a substance is associated with an unpleasant experience, such as nausea (e.g., if you have been sick from a particular food/drink, then you may feel sick again just seeing or smelling that food/drink).



- Olson and Fazio (2001) showed word-image pairs to their participants. One part of the pair was the NS because it did not cause an emotional response. The other part did produce either positive or negative emotional responses and so was a UCS. The participants then unexpectedly had to rate how positively they felt about the images or words. Those paired with a positive UCS were rated more positively than those paired with a negative item. This shows that the participants had been classically conditioned.

- Classical conditioning is seen in the natural behaviour of animals, such as in foraging, hunting and reproductive behaviour.

### E. Evaluating classical conditioning

- Classical conditioning does explain some behaviours (e.g., phobias).
- It has practical applications, such as in behavioural therapies (e.g., aversion therapy).
- It explains only behaviours which already exist (such as salivation), but it does not explain the appearance of entirely new behaviours.
- Learning also includes operant conditioning and observational learning.
- Research into classical conditioning uses laboratory experiments. This enables good control of variables but the research is done in an artificial environment.
- Animals are used to explore how we learn new behaviours. Animals have the advantage of being less complex in behaviour and we can control their environment. However, it is less clear how much can we generalise what we learn from animals to humans.

### 2. The work of Ivan Pavlov

Ivan Pavlov (1849-1936) is famous for explaining how association is established. Pavlov was a medical doctor who studied the nervous system and digestion. He won the Nobel Prize for this in 1904. Pavlov used dogs in his research. By chance, he noticed that the dogs salivated not just when food was present, but also to other cues (e.g., hearing footsteps of person who normally brings the food). As salivation is not under the animal's control, it is involuntary (see text box 1). Pavlov focused on how a stimulus (e.g., a bell) is associated with a bodily response (e.g., salivating). He did an experiment on this in 1927 (see table 2).

**Table 2: The basics of Pavlov's experiment.**

Dogs normally only salivate before eating.	Pavlov sounded a metronome at the same time as feeding the dogs. He did this a number of times	He found that just the sound of metronome made the dogs salivate. So, the dogs learnt (were conditioned) to link (associate) the sound of the bell with "food is coming".
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### Example Exam Question

**Describe the basic principles of classical or operant conditioning. Evaluate the role of classical conditioning in human behaviour.**

In the first section of this question, it asks you to choose between either classical or operant conditioning. Be sure that you know the difference! The basic principles are the main assumptions of conditioning. This factsheet describes these for classical conditioning. You should explain how conditioning works (as in table 1) and you should also be able to explain key terms, such as extinction and spontaneous recovery. The second part of the question asks you to discuss the strengths and limitations of *just* classical conditioning. Some of these are covered in section E of this factsheet.

## Worksheet: Classical Conditioning

Name \_\_\_\_\_

1. Describe what conditioning is.

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2. Explain what classical conditioning is.

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3. What is a difference between operant and classical conditioning?

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4. Who first explained classical conditioning?

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5. Complete the table:

Stage	Stimulus	Response
<i>Before conditioning</i>	Food =	Salivation = unconditioned response
<i>Before conditioning</i>	Bell =	No salivation = no response
<i>During conditioning</i>	_____ plus _____	Salivation =
<i>After conditioning</i>	Bell =	_____ =

6. Using the terms in this Factsheet, explain what has happened in the following example.

“Lucy has a phobia about balloons. When she was a toddler, a balloon popped in her face. As the phobia interfered with her life, she sought therapy. Lucy was shown that a balloon popping is not harmful. Her fear decreased by being exposed to lots of balloons being burst”.

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7. Much research into classical conditioning involves laboratory experiments. What is a possible problem with this?

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8. Give a strength and a weakness of using classical conditioning to explain learning.

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