

Activity Three - Classical Conditioning

Learning opportunities

- Pavlovian or classical conditioning
- Revision of research methods:
 - single participant design
 - controls – the use of baseline measure
- Debates in psychology:
 - use of animals in experimental research

Background information

The Behaviourist approach to psychology focuses on observable events and explains the acquisition of behaviour dependent upon events in the environment. In the case of classical conditioning, those events are the simultaneous (or nearly so) appearance of stimuli, which then become associated. Pavlov demonstrated many such associations, famously one between the stimulus of food and a noise. Some stimuli produce a reflex or automatic response, these are called unconditioned stimuli (UCSs), and the reactions they elicit are called unconditioned responses (UCRs). An unconditioned stimulus when paired with a neutral stimulus (NS), something that does not naturally elicit a reaction, will still result in the production of the UCR. After many pairings, the previously neutral stimulus acquires the ability to elicit a response, now called the conditioned response (CR). This is similar to the UCS although may be slower to appear or weaker. The building of this association can be illustrated:

<i>before conditioning:</i> food (UCS)	→	salivation (UCR)
<i>during conditioning:</i> food (UCS) + tone (NS)	→	salivation (UCR)
<i>after conditioning:</i> tone (CS)	→	salivation (CR)

In this example, the conditioned response is a physical one, salivation. However, Pavlov and other researchers have demonstrated that emotional responses can also be conditioned. For example, Watson & Rayner (1920) conditioned a small boy (known as 'Little Albert') to fear fluffy white things. This was done by making a loud (and scary) noise behind his head each time he was shown a white rat. He soon showed negative responses to the rat and this fear generalised to other, similar, objects.

before conditioning: bang (**UCS**) → fear (**UCR**)
during conditioning: bang (**UCS**) + rat (**NS**) → fear (**UCR**)
after conditioning: rat (**CS**) → fear (**CR**)

Since this is a reliable effect, conditioned emotional responses (CERs) can be used to test factors affecting both learning and fear. For example, Pothuizen et al (2006) used CERs to assess the effect of lesions to the hippocampus and nucleus accumbens on the learning of taste aversions. Wislowska-Stanek et al (2005) have used the CER paradigm to investigate the action of buspirone, a drug used to treat anxiety.

Conducting the activity

As with many of the uses of the GSR2, we have to bear in mind the ethical implications of the task, in this case exposure the loud noises with the intention of conditioning a fear response. This protocol is within the bounds of day-to-day experience as the stimulus used is commonly available through readily accessible sound clips and will not risk causing any greater distress to participants than they would expect to encounter normally. Furthermore, the blue screens following the conditioning procedure are intended to decondition any emotional response that has been acquired.

Divide the students into pairs. In each pair only one will be conditioned. It is essential that this participant can distinguish between red and blue and they should be warned that the experiment involves occasional loud noises. Prime the experimenter in each pair to note the reaction of the GSR to the initial blue screens and, most importantly, to the final blue screen compared to the final red screen. These final screens appear, in each case, after a white screen (ideally, use the '*Instructions for the experimenter*' below).

Protocol for students

Within each pair one of you will be the experimenter, the other the participant. You will not swap over. The participant should be aware that the experiment involves occasional loud noises.

Instructions for the experimenter:

- If you have the opportunity, watch and listen to the presentation sequence before the participant sees it. You need to be ready to record their initial reaction to the first red and first blue screens and their final reactions to blue and red screens.
- If you haven't had this opportunity, the first blue and first red screens appear immediately after 'watch this screen'. The final ones appear following a blank white screen.
- Before you start, warn your participant again about the noises.
- Play the accompanying PowerPoint presentation so that both you and the participant can see it. Record changes in the GSR.
- At the end, reassure the participant that being startled by the bang is perfectly normal.

References

Pavlov IP (1927) *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex*. New York: Dover Publications Inc

Pothuizen HH, Jongen-Relo AL, Feldon J and Yee BK (2006) Latent inhibition of conditioned taste aversion is not disrupted, but can be enhanced, by selective nucleus accumbens shell lesions in rats. *Neuroscience*, **137**(4): 1119-30

Watson JB & Rayner R (1920) Conditioned emotional reactions. *Journal of Experimental Psychology*, **3**(1), 1-14

Wisłowska-Stanek A, Zienowicz M, Lehner M, Taracha E, Bidzinski A, Maciejak P, Skorzewska A, Szyndler J and Plaznik A (2005) Buspirone attenuates conditioned fear-induced c-Fos expression in the rat hippocampus. *Neuroscience Letters*, **389**(2): 115-20