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The differences and similarities between Classical and Operant Conditioning
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The differences and similarities between Classical and Operant Conditioning

Human behaviour is influenced by learning to a great extent. But the term learning does not describe a specific method of gaining knowledge because learning can occur in various ways. Two of these ways often mentioned in psychology are classical and operant conditioning.

Classical conditioning was first observed by the Russian physiologist Ivan Pavlov in the late 1920s. In his famous experiment he noticed that a dog began to salivate in response to a bell after the sound had been repeatedly paired with the presentation of food. He discovered unintentionally that the pairing of a neutral stimulus (the sound of the bell) with an unconditioned stimulus (the presentation of food) lead to an association of these stimuli so that ultimately even the former neutral stimulus presented alone elicited the unconditioned response (salivation). The dog had learned to associate the sound of the bell with the presentation of food. The former neutral stimulus became a conditioned stimulus and the previous unconditioned response a conditioned response. According to that, classical conditioning could be defined as a type of learning in which an organism associates multiple stimuli. A response naturally triggered by one stimulus comes to be triggered by a second and formerly neutral stimulus (Myers 2008: p. 223; Feldman et al. 2005: p. 156).

Opposed to this is the theory of operant conditioning which was first introduced by the American psychologist and behaviourist B. F. Skinner in the 1930s. Based on Edward L. Thorndike’s “trial-and-error learning” he developed the Skinner-Box to study the behaviour of animals in a controlled environment. This laboratory instrument can be described as a chamber that includes at least one bar or key that the animal can manipulate. Skinner placed a rat in that box and as soon as it accidentally hit the bar food was provided as reinforcement to the animal. After repeating that procedure for several times the rat began to intentionally hit the bar to receive food. The voluntary response was successfully strengthened by reinforcement. Subsequently he did the same experiment with a different rat but instead of reinforcing the response he used punishment (such as electric shocks) to weaken the voluntary response. To describe this phenomena he coined the term operant response (as a contrast to Pavlov’s conditioned response) to indicate that the subject operated on its environment in order to produce or reduce a particular effect (Myers 2008: p. 232; Feldman et al. 2005: pp. 162-173). In his further studies Skinner defined different types of reinforcement and punishment based on
whether he wanted to increase or decrease a particular behaviour. Therefore proving that each of them can be positive or negative depending on the fact if a stimulus is added or withdrawn. For example in positive reinforcement a desirable stimulus gets added to the environment, such as receiving food or getting a hug, while negative reinforcement implements the removal of an undesirable stimulus, such as reducing an electric shock. In the context of punishment, the terminology “positive” and “negative” function in the reciprocal manner then they do according to reinforcement. While positive punishment includes the addition of an unpleasant stimulus, such as electric shocks, negative punishment describes the approach of taking away a pleasant stimulus, such as watching television. This procedure, known as shaping, is one of the core elements of operant conditioning because it increases or decreases the probability that a previous behaviour will occur again in future (Feldman et al. 2005: pp. 165-170; Myers 2008: pp. 232-237). In summary operant conditioning could be defined as a type of learning in which a behaviour is strengthened or diminished, depending on its pleasant or unpleasant consequences.

As already mentioned, classical and operant conditioning are two of the most important and well known concepts of behaviourism. To understand how each of these behaviour modification techniques can be used, it is critical to compare and understand their differences and similarities. Even if both types of conditioning result in learning the processes of achieving this goal is not the same. According to Myers the easiest way to remember the differences is by asking two questions: “Is the organism learning associations between events it does not control? Or is it learning associations between its behaviour and resulting events?” (2008: p. 232).

While classical Pavlovian conditioning describes an organism which associates an involuntary response/preexisting reflex with a particular stimulus (respondent behaviour), operant conditioning involves making an association between a voluntary behaviour and its consequence (operant behaviour). Therefore the learner actively participates and acts on its environment to produce reinforcing or punishing stimuli, while in classical conditioning the part of the learner is passive. Additionally to that both types of behaviour modification differ in terms of their order of events. In classical conditioning the stimulus is followed by the response while in operant conditioning the opposite is taking place. (Myers 2008: p. 243; Vander Zanden et al. 2007: p. 45; Cherry 2012). Another distinctive feature can be observed by the cognitive proc-
ess in the learners brain. In classical conditioning an organism develops the expectation that the conditioned stimulus signals the arrival of an unconditioned response. Contrary to that, in operant conditioning the organism develops the expectation that their response will be reinforced, which also includes latent learning without proximate reinforcement (Myers 2008: p. 243). Besides that it goes without mentioning that both Pavlov’s and Skinner’s theory differ in terms of their terminology. All these differences can be summed up by defining classical conditioning as “learning through association“ and operant conditioning as ”learning through the consequences of behaviour“.

Despite the differences that distinguish Pavlov’s and Skinner’s theory there are similarities that link the two types of behaviour modification. In general classical as well as operant conditioning is a method of associative learning and, from an historically point of view, both are defined as behavioural theories (Vander Zanden et al. 2007: p. 46). More detailed, further similarities can be observed in terms of the basic phenomena of conditioning. Both scientists describe the phase of associating a former neutral stimulus with an unconditioned stimulus (classical conditioning) and accordingly the association of a response with a consequence and its strengthening (operant conditioning) as the process of acquisition. Other basic phenomena, such as generalisation and discrimination, are present in both theories as well. Generalisation describes the tendency that a stimulus which is similar to but different from the conditioned stimulus elicits the same conditioned response as the conditioned one. It must be noted here that the more similar the two stimuli are, the more likely generalisation is to occur. Contrary to generalisation, discrimination describes the learned ability to distinguish and differentiate between stimuli. In classical conditioning the organism learns to differ a conditioned stimulus from other unconditioned stimuli. In operant conditioning an organism learns that certain responses, but not others, are being reinforced or punished (Myers 2008: pp. 225-228; Feldman et al. 2005: p. 159; Terry 2009: pp. 57-61). Further common features mentioned in both behavioural theories are the tendency of extinction and the mechanism of spontaneous recovery. The former describes the decrease in frequency and eventual disappearance of a previously conditioned response; a common phenomena in learning theories. Extinction in classical conditioning means the diminishing of a conditioned stimulus if it is not longer followed by an unconditioned stimulus. In operant conditioning extinction appears when a response is no longer followed by consequences, either reinforcement or punishment (Myers 2008: p. 243). Spontaneous recovery on the other