

General principles of classical conditioning and operant conditioning

[Psychology](#), [Behaviorism](#)



Though classical conditioning and operant conditioning are both techniques involving learning and the acquisition of behaviors, they have contrasting- but sometimes complementary- ways of training. However, with pioneers in each conditioning practice believing in the general principle, " Psychology should be based on experimental investigation of behaviors," the two fields often intersect.

Classical conditioning was brought to the forefront of psychology via Ivan Pavlov's experiments with dogs. His theory suggested that an organism could learn to associate one stimulus it expected and responded to automatically with a stimulus that held no prior importance to the organism. In his experiments, Pavlov would have the original stimulus, or the unconditioned stimulus (UCS), follow the non-important stimulus, or neutral stimulus (NS), when presented to the dogs. He would then observe the innate reaction to the UCS, or the unconditioned response (UCR), to the original UCS. Eventually, through repetition of the pairing (association) of the NS and the UCS, the dogs would begin to demonstrate the same innate behavior to the NS alone. This was a major breakthrough: the NS was no longer neutral; it became a conditioned stimulus (CS), and the once-unconditional response now became a conditioned response (CR).

Through further experimentation with this base knowledge, Pavlov identified five major conditioning processes: acquisition, extinction, spontaneous recovery, generalization and discrimination. Acquisition defined the initial stage of the conditioning process when the association of the NS with the UCS took place. The organism acquires an expectation that the NS comes to

signal a UCS, and consequently responding accordingly. When a CS is no longer followed by the UCS, extinction occurs and the CS will eventually cease to elicit a CR. In simpler terms, the number of responses decreases, or becomes extinct. An extinguished CS can, however, make a random appearance after a 'rest period' between the applications of conditioned stimuli. This is called spontaneous recovery, and it led Pavlov to understand that extinction suppressed the CR, rather than eliminating it. Generalization and Discrimination both involve the distinguishing of outside stimuli and whether or not they will signal a response: generalization is a tendency to associate similar stimuli with the original CS, and discrimination is when an organism can discriminate between the CS and other stimuli.

Let's say that a child is sitting at the dinner table with a plate of pizza before him. Pepperoni pizza is his favorite food, and it always has been. This time, however, the pepperoni tastes a little funny. Shortly after dinner, his stomach becomes a little upset, and a little upset quickly accelerates into full-blown sick. The poor, sick boy is in the hospital for a week with what the doctor tells him is food poisoning. He doesn't really care what it is, just as long as it doesn't happen again. While in the hospital bed, he thinks and thinks what made him sick, and the only drawn conclusion is, " Oh, it must have been the funny-tasting pepperoni". Once recovered, the boy no longer desires pepperoni pizza. Au contraire, he absolutely abhors the thought of it.

This is an example of classical conditioning. The boy acquired the association of nausea and the horrible stomach pain with the pepperoni pizza. If he continues to eat pizza, only those with sausage or vegetables, he's learned

to discriminate between the pepperoni he believes made him sick and other types of pizza. If he decides never to eat pizza ever again, he's made a generalization that all pizza will make him sick. He can spontaneously recover his learned response if he begins, again, to eat pizza (which would be the extinction of his of his acquired behavior) until one day he, all of a sudden, decides not to because he remembers that "one time..."

Another major type of conditioning is called operant conditioning, and instead of associating two events or stimuli (as in classical conditioning), it allows an organism to learn through the expectations of a reinforcement or punishment. B. F. Skinner was a pioneer in the field of behaviorism and in operant conditioning, believing that external influences, not thoughts or feelings, shaped behavior. He believed in these principles so strongly that he even used his own child to demonstrate his points.

Operant conditioning revolves around two major aspects: reinforcement and punishment. According to Edward L. Thorndike's law of effect, a rewarded behavior is most likely to recur. For instance, a rat in an operant chamber will learn to press a bar or a button if he 'thinks' or expects to get food. This is an example of positive reinforcement, which aims to encourage behavior. If the rat expects to be shocked when he touches the bar, he will avoid it. This is an example of positive punishment, which acts to decrease the frequency of a behavior. There is also another type of reinforcement, as well as punishment: Negative reinforcement removes an annoying, or aversive, stimulus from an organism's environment to reward. Negative punishment,

along the same lines, removes a desired or pleasurable stimulus to punish. These are all examples of how a creature's behavior can be shaped.

As is in classical conditioning, similar processes as mentioned above occur in operant conditioning as well. Though slightly differing to the principles of the conditioning type, they have the same basic definitions. Acquisition, here, is the association of one response with a consequence, such as a reinforcement or punishment. Extinction occurs when a response is no longer reinforced. Spontaneous recovery, in operant conditioning, is demonstrated by the organism's continued response to a behavior that is no longer reinforced. Generalization would occur, for instance, if a dog was rewarded for responding to a number of tones when he was only conditioned on one tone. He would have generalized the tone. This is the opposite of discrimination, where that dog would only respond to the first tone, and not to the similar ones.

A good example of operant conditioning would be any given superstitious behavior, where a person thinks—even if unjustly—that one random stimulus triggered something great to happen. For instance, a man is walking through a mall when he comes upon a face-up penny. He picks it up, and seconds later he runs straight into Claudia Schiffer. She tells him how cute he is, gives him her cell phone number, and walks on. The man now thinks, “Wow! That never would have happened to me if I hadn't have found that ‘lucky penny’. I need to keep this with me always so good things like this will happen to me.”

The penny was a stimulus that the man believed triggered positive reinforcement (Claudia Schiffer). He has acquired the association of the penny with getting Claudia Schiffer's phone number. If he knows that only that penny will bring him luck, he has discriminated between stimuli. If he now thinks that all pennies are lucky, he has generalized. If Claudia Schiffer doesn't return his calls and no more pretty girls come up to him, this belief, or behavior, will likely become extinct. However, if one day he finds another penny and picks it up with the faint hope of running into Miss Schiffer once again, then spontaneous recovery has now occurred.

The most distinguished difference between classical and operant conditioning would be that in classical conditioning, the organism receives an automatic reinforcement that is always associated with a NS+UCS or a CS. This is contrasted in operant conditioning where the organism has to perform for the reinforcement, and is punished for not responding or responding counter-accordingly. Classical conditioning applies to a behavior that is always encouraged in one way or another: there is always a positive or a negative reinforcement. No punishment, as in operant conditioning, is applicable in classical conditioning.

While similar and different simultaneously, both classical and operant conditioning prove to be rather reliable ways in encouraging or discouraging an organism into learning a behavior or response.