Pavlov's Dogs

SimplyPsychology

Saul McLeod, published 2007, updated 2013

Like many great scientific advances, Pavlovian conditioning (aka classical conditioning) was discovered accidentally.

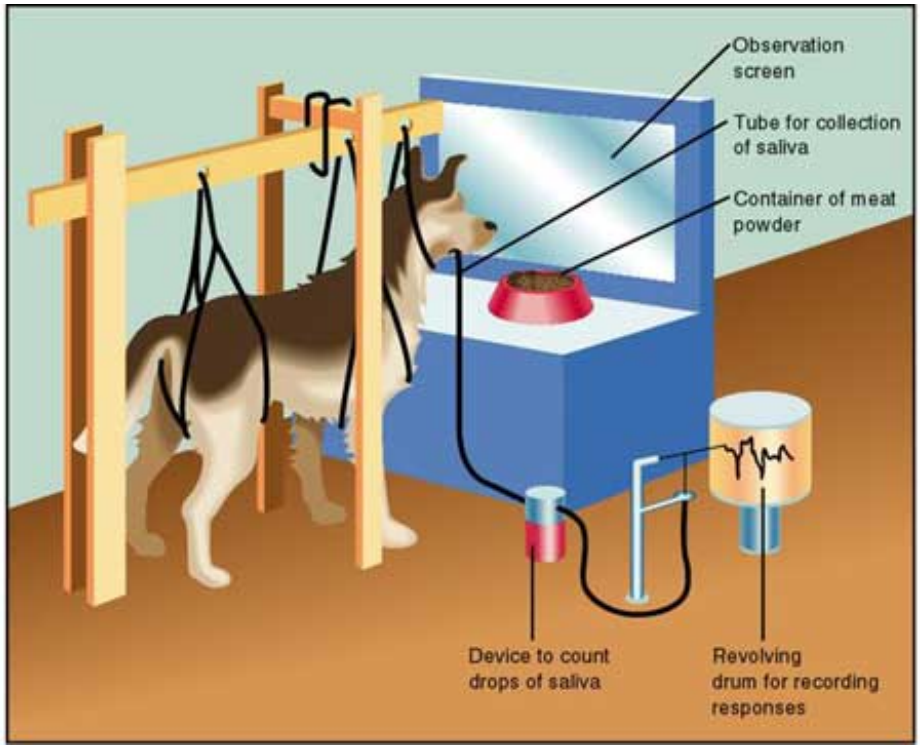
During the 1890s, Russian physiologist, Ivan Pavlov was looking at salivation in dogs in response to being fed when he noticed that his dogs would begin to salivate whenever he entered the room, even when he was not bringing them food. At first, this was something of a nuisance (not to mention messy!).

Pavlovian Conditioning

Pavlov (1902) started from the idea that there are some things that a dog does not need to learn. For example, dogs don't learn to salivate whenever they see food. This reflex is 'hard-wired' into the dog. In behaviorist terms, it is an unconditioned response (i.e., a stimulus-response connection that required no learning). In behaviorist terms, we write:

Unconditioned Stimulus (Food) > **Unconditioned Response** (Salivate)

Pavlov showed the existence of the unconditioned response by presenting a dog with a bowl of food and the measuring its salivary secretions (see image below).



However, when Pavlov discovered that any object or event which the dogs learned to **associate** with food (such as the lab assistant) would trigger the same response, he realized that he had made an important scientific discovery. Accordingly, he devoted the rest of his career to studying this type of learning.

Pavlov knew that somehow, the dogs in his lab had learned to associate food with his lab assistant. This must have been learned, because at one point the dogs did not do it, and there came a point where they started, so their behavior had changed. A change in the behavior of this type must be the result of learning.

In behaviorist terms, the lab assistant was originally a neutral stimulus. It is called neutral because it produces no response. What had happened was that the neutral stimulus (the lab assistant) had become associated with an unconditioned stimulus (food).

In his experiment, Pavlov used a bell as his neutral stimulus. Whenever he gave food to his dogs, he also rang a bell. After a number of repeats of this procedure, he tried the bell on its own. As you might expect, the bell on its own now caused an increase in salivation.

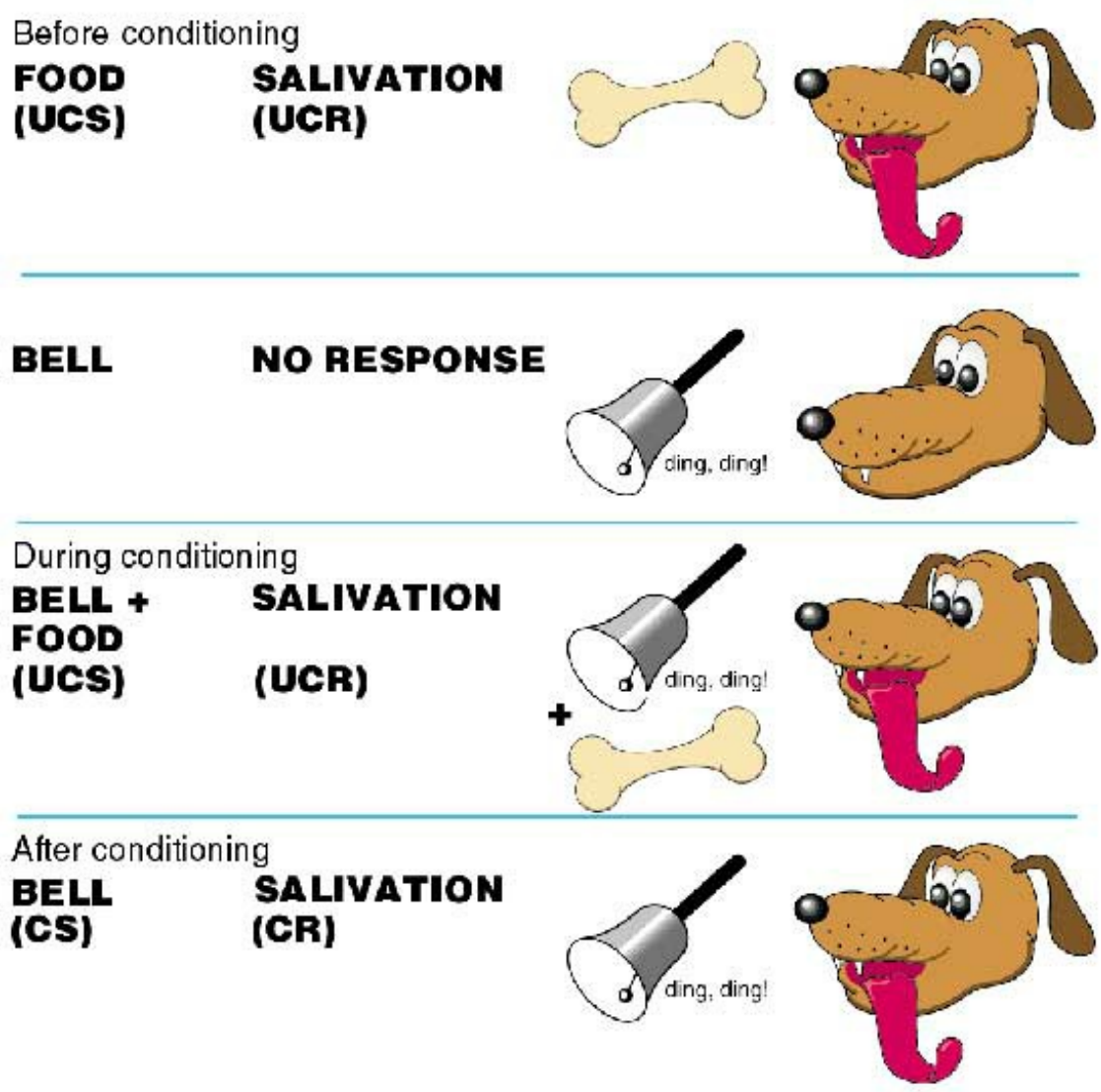
So the dog had learned an association between the bell and the food and a new behavior had been learned. Because this response was learned (or conditioned), it is called a conditioned response. The neutral stimulus has become a conditioned stimulus.

Pavlov found that for associations to be made, the two stimuli had to be presented close together in time. He called this the law of temporal contiguity. If the time between the conditioned stimulus (bell) and unconditioned stimulus (food) is too great, then learning will not occur.

Pavlov and his studies of classical conditioning have become famous since his early work between 1890-1930. Classical conditioning is "classical" in that it is the first systematic study of basic laws of learning / conditioning.

Summary

To summarize, classical conditioning (later developed by John Watson) involves learning to associate an unconditioned stimulus that already brings about a particular response (i.e., a reflex) with a new (conditioned) stimulus, so that the new stimulus brings about the same response.



Pavlov developed some rather unfriendly technical terms to describe this process. The unconditioned stimulus (or UCS) is the object or event that originally produces the reflexive / natural response.

The response to this is called the unconditioned response (or UCR). The neutral stimulus (NS) is a new stimulus that does not produce a response.

Once the neutral stimulus has become associated with the unconditioned stimulus, it becomes a conditioned stimulus (CS). The conditioned response (CR) is the response to the conditioned stimulus.

References

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Key Terms

Stimulus

Any feature of the environment that affects behavior. E.g. in Pavlov's experiments food was a stimulus.

Response

The behavior elicited by the stimulus. E.g. in Pavlov's experiments salivation was a response.

Unconditioned Stimulus

A feature of the environment that causes a natural reflex action. E.g. a puff of air blown into the eye causes an involuntary blink.

Conditioned Stimulus

A feature of the environment that has an effect through its association with a U.C.S. E.g. Pavlov's dog learned to salivate at the sound of a bell.

Conditioned Response

The behavior elicited by the C.S. E.g. Salivation when the bell rings.

Extinction

The dying out of a conditioned response by breaking the association between the C.S. and the U.C.S.

E.g. When the bell was repeatedly rang and no food presented Pavlov's dog gradually stopped salivating at the sound of the bell.

Spontaneous Recovery

The return of a conditioned response (in a weaker form) after a period of time.

E.g. When Pavlov waited for a few days and then rang the bell once more the dog salivated again.

Generalisation

When a stimulus similar to the C.S. also elicits a response. E.g. Initially Pavlov's dog salivated at the sound of any bell – not just the food bell.

Discrimination

The opposite of generalisation i.e. the ability of the subject to tell the difference between two similar stimuli.
E.g. Eventually Pavlov's dog learns the difference between the sound of the 2 bells and no longer salivates at the sound of the non-food bell.

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