Module 7 : Conditioning

- Pavlov’s Research with Dogs
- The Principles of Classical Conditioning
- Skinner’s Animal Research
- The Principles of Operant Conditioning

In this module you will learn about classical and operant conditioning. After learning about the theories and experiments underpinning each concept, we will look at how you can apply this knowledge to the training and understanding your pet.

- Pavlov's Research with Dogs
- The Principles of Classical Conditioning
- Edward L. Thorndike & the Law of Effect
- Watson's Work with Little Albert
- Skinner's Animal Research
- The Principles of Operant Conditioning
- The Principles of Conditioning In Action

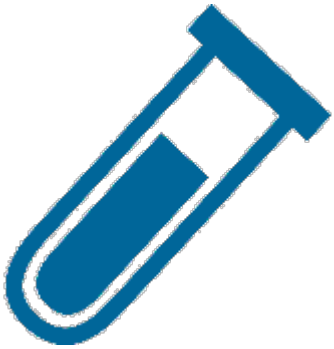
Conditioning – 5m21s

7.1 Introduction – What Is Conditioning?

Conditioning is a process by which an animal's responses to an event or object are changed as a result of learning.

Specifically, conditioning entails associative learning. An animal discovers that certain events will reliably occur together. For example, if a dog eats a new food and likes the taste it will form an association between the food and a pleasant sensory experience. Because of this new association it will be eager to eat the food next time.

7.2 Pavlov's Research with Dogs



Ivan Pavlov (1849-1936) was a physiologist who was primarily interested in the biology of digestion However, he became famous for his work with dogs which would inform key theories of conditioning.

Prior to discovering the mechanisms of classical conditioning Pavlov was investigating the role of saliva in digestion. Specifically, he was interested in the amount of saliva dogs produced when presented with food and how much they produced when eating. He fully anticipated that they would salivate when they first saw and smelled the food and this was supported by his data. However, he also noticed that the dogs began to salivate before the food was bought into the room. He soon worked out that, when the dogs heard the footsteps of his assistant approaching the room, the dogs started salivating in anticipation. They had learned that the assistant's footsteps were followed by the presentation of food and they automatically salivated in response.

7.3 The Principles of Classical Conditioning

Pavlov redirected his attention away from the physiology of digestion and began to research learning instead. He began by acknowledging that not all responses are learned; in this case, the dogs did not need to learn to salivate. This is a reflex hard-wired into the dog from birth.

Psychologists call this an unconditioned response. The food is an unconditioned stimulus. Pavlov began experimenting with using tones to condition dogs. At first, a tone would elicit no particular response in a dog. It was a “neutral stimulus” that did not trigger any kind of conditioned response. Pavlov then started to sound tones immediately prior to feeding the dogs. He repeated this procedure several times. He discovered that the tone by itself would elicit salivation. The tone therefore became a “conditioned stimulus,” and the salivation a “conditioned response”.

Conditioned responses are sometimes called “Pavlovian responses”. Further experiments showed that the stimuli had to be presented to the animal within a short space of time. Pavlov termed this “the law of temporal contiguity”. If there is a significant time lag between a conditioned and unconditioned stimulus that is too large, an animal will not learn.

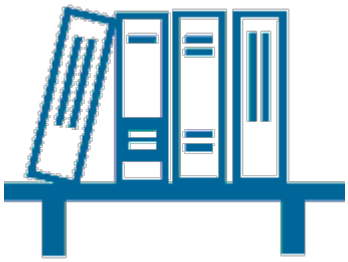
Pavlov also researched the question of whether the conditioning process could be reversed. He discovered that if he presented the tone but not the food then the dogs would eventually unlearn the association. However, in some cases for reasons that are not entirely clear, an animal may suddenly revert back to a conditioned response. This is known as “spontaneous recovery.” The strength of the original association and genetics may play a role.

7.4 Edward L. Thorndike & the Law of Effect

Edward L. Thorndike (1874-1949), an American psychologist working in the late 19th and early 20th centuries, was a pioneer in the field of learning.

His major contribution to the field was the “Law of Effect”, which he described in 1905. This rule states that if an animal enjoys a positive outcome following a behavioural response (R) to a stimulus (S) they are more likely to repeat that behaviour in the future when presented with the same stimulus. At the same time, a response that elicits an undesirable effect is less likely to be repeated in the future. This observation, although simple, encouraged other researchers to investigate learning in both humans and animals.

7.5 Watson's Work with Little Albert



Inspired by Pavlov's work with animals, psychologist John B. Watson founded in 1913 his own school of psychological thought, which he referred to as “Behaviourism”.

In brief, Watson believed that psychology should not focus on subjective human experience but instead focus on objective data gleaned from empirical observation. He reasoned that, by observing and experimenting with behaviour rather than thought, psychology could develop into a science based on replicable experiments. In 1920 Watson, together with his colleague Rosalie Rayner, had the chance to demonstrate how classical conditioning works in humans.

They studied a young child, known as Albert B, in an attempt to condition his responses. First, Watson and Rayner presented Albert with a range of stimuli, including a rabbit and a white rat. He was not perturbed by any of them. They then began to strike a steel bar whenever they presented Albert with a white rat. After several such trials the very sight of the white rat reduced Albert to tears. Therefore, the experiment showed that classical conditioning can lead to the development of phobias. Albert also began to fear stimuli that resembled the white rat, including a fur coat and a Santa mask. Watson dubbed this phenomenon “generalisation”.

7.6 Skinner's Animal Research

American psychologist BF Skinner (1904-1990) furthered behaviourism by carrying out research into the role of reward and punishment in shaping behaviour.

Skinner was a “radical behaviourist” and believed that all behaviour – even in humans – could be explained with reference to theories of conditioning. He went so far to say that free will is an illusion. He conducted many experiments, drawing on numerous techniques. However, his most famous methodology involved a piece of apparatus that came to be known as a “Skinner box”. Each box served as a chamber in which Skinner would place an animal. Depending on the design, the animal could press a lever that would elicit some kind of reinforcement, such as a food pellet.

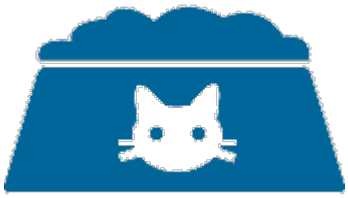
Skinner also designed a special recorder that monitored the animal's response rates after they had hit the bar. He found that after receiving a reward the response rate increased. If an animal was not rewarded then the response rate dropped. Unlike Pavlov and Watson, he was interested in how an animal's experience after (not before) their responses influenced their future behaviours. He termed behaviours that were dependent on what occurs following a response “operant behaviour”. To put it another way, the term refers to behaviour that operates on the animal's surroundings.

FACT

A dog's short-term memory is approximately five minutes in duration, whereas a cat's can be up to 16 hours. However, both find it easy to form long-term associations.

Source: Canidae.com

7.7 The Principles of Operant Conditioning



According to Skinner, an operant is any type of behaviour that involves taking direct and intentional action on the surrounding environment, which elicits some kind of consequence.

He distinguished between operant and respondent behaviours. Whereas the former are intentional, the latter are based on reflexes. For instance, a cat jumping away from a loud noise is showing respondent behaviour.

According to Skinner, positive and negative reinforcement shape an animal's behaviours. Positive reinforcement involves a pleasant outcome, such as a treat. Negative reinforcement entails removing an unpleasant stimulus from the environment with the intention of encouraging a behaviour in the future. For example, if you were training a cat to use a litter tray, then providing it with a treat when it uses the tray would be positive reinforcement. If you were training a dog to sit by applying pressure to its hindquarters and only releasing your hand when it sat down, this would be negative reinforcement – you are removing something the dog does not like when it obeys, thereby producing the desired behaviour.

Punishment also shapes behaviours. Unlike reinforcement, punishment is used to discourage or weaken a behaviour. Punishment can be positive or negative.

Positive punishment consists of administering an unpleasant consequence for behaviour, such as admonishment. Negative punishment entails removing a pleasant outcome or stimulus, such as removing a favourite toy.

Skinner was also interested in schedules of reinforcement. He was keen to learn whether varying the frequency of a reward would have an effect on learning. He carried out lots of experiments in which he rewarded a desired behaviour after every single trial, after every third trial, every fourth trial and so on.

He also tried rewarding behaviours at random or after a fixed period of time. In general, rewarding a behaviour every time it occurs is best when teaching it for the first time. However, once it is established, you can use an intermittent reinforcement schedule.

Skinner discovered that intermittent and random reinforcements can trigger compulsive behaviour that takes longer to extinguish. This means that if you are training a pet with the intention of instilling a permanent change in behaviour, intermittent reinforcement is the best option.

7.8 The Principles of Conditioning in Action

Having addressed the principles and history of classical and operant conditioning, let's look at some examples showing how they can help us understand and change an animal's behaviours.

Classical Conditioning

Example 1: Dogs Developing a Fear of the Vet

Many dogs dislike going to the vet. The first few times a dog attended the vet, the waiting room would have been a neutral stimulus that held no particular meaning for the dog. However, the dog may then have experienced an unpleasant unconditioned stimulus, perhaps in the form of a painful injection. As a result, they experience fear and stress – an unconditioned response. After a few such experiences the vet clinic will become a conditioned stimulus and the unpleasant feelings will become a conditioned response.

Example 2: Using Treats to Encourage a Shy Pet

Some pets are naturally more sociable than others. However, it is possible to use classical conditioning to encourage a pet to be more tolerant and welcoming of visitors. Suppose an owner wanted to condition their cat to feel comfortable around strangers. Whenever a stranger entered the home the owner could give the cat a few treats. After a few attempts a visit would become a conditioned stimulus and the positive feelings would become a conditioned response.

Remember that classical conditioning does not involve rewards or punishment. In this instance the cat is not being rewarded for cooperating; the owner is merely helping the cat associate socialising with positive feelings. Eventually they will not need to give the cat a treat because it will associate the scenario with a favourable outcome.

Operant Conditioning

Example 1: Training a Dog to Sit

Giving a dog a treat when they perform an action on command will encourage them to obey the command in future. This is an example of positive reinforcement via the administration of a reward.

Using rewards can also be used to teach more complex behaviours. This is called “shaping.” It entails administering rewards for actions that, at first, may bear only a rough resemblance to the target behaviour and then conditioning the animal to build on that behaviour until they carry out the entire sequence.

For instance, suppose an owner wanted to train their dog to retrieve their slippers from the hallway whenever they said “Slippers!” The dog will not carry out this sequence at first. Instead they will first need to be rewarded when they head in the direction of the hallway after hearing the command, then rewarded when they touch the slippers, and so on. Depending on the dog's nature and intelligence this may take some time and patience.

Example 2: Discouraging Cats from Scratching Furniture

Instead of simply rewarding pets for positive behaviour, it is also possible to deter them from negative behaviour by making it less appealing. For example, if a cat repeatedly scratches at the furniture, make it a less desirable activity by putting double-sided sticky tape on the furniture, or draping a heavy piece of cloth over it - anything that makes the scratching less pleasurable.

The likelihood of future scratching is reduced.

As you will learn later in this course, most trainers consider punitive measures, such as punishment, to be undesirable. Most believe that it is more effective - and much kinder -to focus on rewarding good behaviour instead.

Module Summary

- Conditioning shapes an animal's behaviour by establishing links between a stimulus and reinforcement. Conditioning entails associative learning.
- The two most notable and well-researched forms of conditioning are operant and classical conditioning.

- Classical conditioning was first researched by Ivan Pavlov. He discovered it was possible to condition animals to respond to a previously neutral stimulus.
- Edward Thorndike put forward The Law of Effect, which in turn laid the foundations for behaviourism.
- John Watson demonstrated that classical conditioning could be used in humans and maintained the human behaviour was the result of experience, not an expression of nature.
- Skinner built on Watson's ideas and developed a theory of operant conditioning. This is based around reinforcement and punishment.
- Classical and operant conditioning are both useful when understanding and training pets.

[Tweet "I just completed Module 7 of the Pet Psychology Diploma Course"]