Classical Conditioning

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Learning Unit 5 covers three different types of learning: classical conditioning, operant conditioning, and cognitive learning. This lesson focuses on the dynamics of classical conditioning, but let’s begin with the definition of learning. Learning is a relatively enduring or permanent change in behavior that results from experience. Behavior would be referred to any observable response, such as sweating, fainting, jumping, et cetera.

Classical conditioning is a type of learning caused by associations. The terminology of classical conditioning can be a little wordy, so bear with me as I go over the technical concepts. Once you see examples of classical conditioning, the ideas will make sense.

Classical conditioning is a kind of learning in which a neutral stimulus acquires the ability to produce a response that was originally produced by a different stimulus. Classical conditioning was discovered by Russian physiologist Ivan Pavlov. While studying the digestive system of dogs, he noticed that the dogs in his experiments began salivating to sounds that were associated with food, like the sound of the food cart being wheeled in during feeding times. He began to play with this discovery and hooked the dogs to an apparatus that collected their saliva.

When food is placed on a dog’s tongue, the dog naturally salivates. The salivation to the food is considered the unconditioned response. Unconditioned basically means unlearned; it’s a natural response to the stimuli presented. The unconditioned stimulus, in this case, would be the food. The unconditioned stimulus is a stimulus that elicits an unconditioned response.

A neutral stimulus is a stimulus that causes a sensory response, such as being seen, heard, or smelled, but does not produce the reflex being tested. In his experiments, Pavlov used the sound of a tone or a bell. A dog hears a bell, but does not naturally salivate to sound. Pavlov would ring a bell and present food to a dog, which would then salivate. Ringing the bell and presenting the food is called acquisition. The acquisition in this case would be the process of creating an association between the unconditioned stimulus and the neutral stimulus. The initial process of forming new responses through repeated pairing of the neutral stimulus, the bell, and the unconditioned stimulus, the food. Basically, an association between the bell and food is being created.

Once the association has been made between the bell and the food, the bell becomes the conditioned stimulus. A conditioned stimulus is a formerly neutral stimulus that acquires the ability to elicit a response that was previously elicited by the unconditioned stimulus. When Pavlov would just ring the bell without presenting the food, the dogs would react by salivating.

The salivation to the bell is called the conditioned response. The conditioned response is elicited by the conditioned stimulus and similar stimuli, but is not identical in size or amount to the unconditioned stimulus.
To recap Pavlov’s experiment, food is the unconditioned stimulus, because a dog naturally salivates to its presence. Salivation to the food is the unconditioned response, the unlearned reaction. The bell is initially the neutral stimulus, because bells don’t make dogs drool. After acquisition has occurred between the bell and the food, the bell becomes the conditioned stimulus and the dog salivating to only the sound of the bell is the conditioned response.

Sometimes a conditioned response can generalize to other similar conditioned stimuli. For example, Pavlov may ring all different types of bells and the dogs may still have a salivatory reaction. Generalization is the tendency for a stimulus that’s similar to the original conditioned stimulus to elicit a response similar to the conditioned response.

In other cases, discrimination may occur in that the dogs would only salivate to the particular tone of the bell used. Discrimination occurs during classical conditioning when an organism learns to make a particular response to some stimuli but not to others.

Let’s say that after learning about classical conditioning you decide to classically condition your dog to salivate to the sound of a bell. You succeed and your dog salivates to the bell, so you ring your bell, and ring your bell, and keep on ringing it. Over time, if you no longer associate the bell with food, your dog may stop salivating to the sound of the bell. This is called extinction. Extinction refers to a procedure in which a conditioned stimulus is repeatedly presented without the unconditioned stimulus, and, as a result, the conditioned stimulus tends to no longer elicit the conditioned response.

So, you get bored and put the bell away. Months later, while cleaning your house, you come across the bell and start to ring it. Your dog may have a salivatory reaction. This is called spontaneous recovery; the tendency for the conditioned response to reappear after being extinguished, even though there have been no further conditioning trials.

Classical conditioning is all around you. We are going to break down several examples to help you recognize the elements of conditioning.

One common example is fast-food logos. The majority of us love ourselves a good juicy burger. The sight or smell of a burger causes us to salivate. The burger would be the unconditioned stimulus; salivation to its sight would be the unconditioned response. Burgers are often paired with a restaurant’s logo. We will use McDonalds in this scenario. The burger is associated with the golden arches and in turn you may salivate at the sight of McDonald’s “M” logo. McDonald’s golden arches would be the neutral stimulus. The letter “M” does not naturally cause a person to salivate; however, when associated with food so many times, the sight of the “M” may cause salivation. The “M” then becomes the conditioned stimulus and salivating in response to seeing the “M” is a conditioned response.

A personal example of classical conditioning occurred when I was pregnant. I was nauseated the entire nine months of my pregnancy. When my stomach became empty, I would feel really sick, so I ate…… a lot, and gained myself a good eighty pounds. Don’t worry, people who want to get pregnant in the future—nine months of nausea and eighty pounds of weight gain is not typical. Anyway, pregnancy would be the unconditioned stimulus and feeling nauseated in reaction to the pregnancy is the
unconditioned response. At that time in my life, I worked as a mobile therapist and spent a lot of time in my vehicle driving to different therapy appointments. Needless to say, I spent a lot of time in my car feeling sick. After my child was born, I was no longer sick. However, sometimes, even years later, when I get into my vehicle, I feel a sense of nausea. The car initially was the neutral stimulus which turned into the conditioned stimulus. Feeling nauseated in the car, long after I was no longer sick from pregnancy, was the unconditioned response. This would also serve as an example of spontaneous recovery, because the response had become extinct for a time period and later sporadically returned.

John B. Watson and Rosalie Raynor believed that emotional responses in humans could be created through classical conditioning, leading to the infamous Little Albert experiment. The experiment used eleven-month-old Little Albert to see if phobias could be conditioned.

Upon beginning the experiment, Little Albert showed no fear of white rats. When a rat was placed near him, he reached out for it. Watson and Raynor decided to present Little Albert with a rat and then bang a hammer against a steel bar behind Little Albert’s head. Naturally, the loud sound startled the baby and he cried. The loud noise, the hammer banging against the steel bar, was the unconditioned stimulus. Little Albert’s response of becoming startled and crying was the unconditioned response. During acquisition, Watson and Raynor would plop the rat into Little Albert’s lap and then bang the hammer against the bar. Eventually, Little Albert would become upset in response to the presence of the rat, even when the loud noise was no longer administered. Initially, the rat served as the neutral stimulus and then became the conditioned stimulus. Little Albert’s fear of the rat was a conditioned response or conditioned emotional reaction.

Little Albert’s fear of the white rat generalized to other white fuzzy objects, and he became upset at the sight of a dog, rabbit, and Santa Claus beard.

In today’s world, this experiment would never be passed by an ethics committee, because experiment participants must leave an experiment in the same psychological condition as they entered. Participants must not be harmed in any way.

Ethics aside, the Little Albert experiment did show us how phobias can be learned. If I’m driving along in my car admiring a beautiful butterfly and I crash into a telephone pole, my fear and anxiety from the accident may be transferred to butterflies, creating an intense fear of the fluttery insects.

Little Albert’s fear of rats and my fear of butterflies are called conditioned emotional reaction: an emotional response to a particular stimulus acquired through classical conditioning.

Scents and sounds are often conditioning devices, particularly when associated with emotionally charged circumstances like a funeral or an epic adventure, but can also result from consistent mundane experiences.

Let’s say you have a kind, loving mother. Mom makes you feel comfy and secure. Your mom always wears vanilla perfume. Even when mom is not around, if you catch the scent of vanilla, you may feel comfort. Mom would be the unconditioned stimulus, feeling love and comfort is the unconditioned
response. A vanilla scent is initially the neutral stimulus, but after its acquisition has been created with mom, it becomes the conditioned stimulus, and feeling love and comfort in response to a vanilla scent is the conditioned emotional reaction or conditioned response.

I want to conclude with one more example of classical conditioning. Watson later moved from academia to marketing. He made his mark by encouraging advertisers to associate their products with emotional stimuli. We can “thank” him for the various products associated with sexuality. I’m most impressed with his work while on the Maxwell House Coffee campaign.

Everyone loves to take a break. Positive, relaxing feelings are a natural reaction to a break. In this case, taking a break is the unconditioned stimulus. Positive feelings are the unconditioned response. The neutral stimulus is Maxwell House Coffee. Watson encouraged the company to associate taking a break with drinking coffee. Maxwell House Coffee is initially the neutral stimulus and after the association with taking a break, it becomes the conditioned stimulus. In turn, people’s reaction to taking a break is to drink coffee and feel positive relaxing feelings in response to the coffee. Genius.

Just keep in mind that classical conditioning involves a reaction. Operant conditioning is a behavior choice due to the consequences, whereas classical conditioning tends to be an implicit type of learning. Think about your emotional reactions to different songs. Does a particular song make you feel sad because you heard it at a funeral? Are you enticed to buy a certain product because of the celebrity advertising the product? Try to recognize the active role that classical conditioning plays in your everyday life.