Learning and Classical Conditioning - Ivan Pavlov

Learning is defined as an enduring change in behavior and knowledge due to experience. Organisms learn by forming associations between cause and effect or two events. Our brains naturally connects events that follow each other. In other words, they are exhibiting **associative learning.**

Behaviorism, developed by John Watson, is the view that psychology should be an objective science and one in which we study how organisms respond to their environment.

Learned associations were of particular interest to John Watson, Ivan Pavlov and B.F. Skinner

http://www.youtube.com/watch?v=CpoLxEN54ho&feature=player_embedded

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Classical conditioning is based on **Respondent Behavior** in which there is an automatic response to a certain stimuli ("responding behaviors").

The following terms are important to the description of and understanding of Pavlov's research:

1. Unconditioned Response (UCR) : the normal response to a unconditional ("unlearned") stimulus. For instance, in Pavlov's experiment, the normal response a dog has when presented with food is *salivation*. Salivation is the UCR.

2. Unconditioned Stimulus (UCS) : the stimulus that triggers the normal response (UCR). For instance, the *food* is the UCS in Pavlov's experiment- it "naturally" triggers salivation.

3. Conditioned Response (CR) : the response that is learned ("conditioned"). For instance, Pavlov's dogs learned to *salivate* upon the presence of a ringing tone because the tone was associated with the food. Salivating to the sound of the tone is the CR.

4. Conditioned Stimulus (CS) : a neutral stimulus that triggers a learned response. For instance, the *ringing tone* is a CS because the dog learned to salivate at the presence of a ringing tone as opposed to the presence of the food alone.

NOTE: This kind of association is possible because Pavlov presented a ringing tone every time *before* the food was given to the dog. Eventually, the dog learned to anticipate food at the sound of ringing, so the dog would salivate.

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There are 5 major processes with Classical Conditioning:

1. **Acquisition -** The initial formation of the association between CS and CR. This works well when the CS is presented *half a second before* the UCS is presented.

2. **Extinction -** If the UCS is not presented after CS for a couple of times, the organism will not respond to the CS. For instance, If after the ringing tone no food arrives, the dog stops salivating at the presence of just the tone.

3. **Spontaneous Recovery -** However, if the UCS is again presented after the CS, extinction ceases and the organism again begins to respond to the CS. For instance, if the food is again presented after ringing, the dog salivates.

4. **Generalization -** The tendency for organisms to respond similarly (to generalize) to similar stimuli as the CS. For instance, Pavlov's dog salivating to the sound of beeping that is similar to ringing. This is good because if you teach children to watch out for cars, they will also watch out for similar objects like trucks and vans.

5. **Discrimination -** The ability to distinguish (discriminate) between different stimuli thereby allowing you to react differently to different things.

Pavlov's Dog

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How is classical conditioning connected to natural selection?

- An animals capacity for learning is constrained by its biology. Natural selection favors traits that aid survival so we are predisposed to learn associations that enhance survival.
- Being able to learn to adapt to your environment aids survival and so is a trait that is favored by natural selection, and thus passed on by reproduction.

Taste Aversion

The ability to develop a taste aversion is considered an adaptive trait or survival mechanism that trains the body to avoid poisonous substances (e.g., poisonous berries) before they can cause harm. This association is meant to prevent the consumption of the same substance (or something that tastes similar) in the future, thus avoiding further poisoning.

Taste aversion does ***not*** require cognitive awareness to develop--that is, the subject does not have to think, "Wow, this tastes like the stuff that got me sick."

Also, taste aversion generally only requires one trial.

Aversions can also be developed to odors as well as to tastes.

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Examples... http://www.youtube.com/watch?v=qy_mIEnnlF4

A human who eats for the first time and who happens to come down with an unrelated stomach virus or may still develop a taste aversion to sushi.

Sheepherders have used this natural process to stop wolves from eating their sheep, without having to kill the wolves, which in a number of areas is illegal. Sheepherders learned to treat the mutton with a non-toxic substance that would make animals that eat the meat dizzy and nauseous. They would disperse the treated mutton at some distance from the herding sheep. Wolves that encountered the mutton lying on the ground would readily eat this free, no work meal. They would soon become dizzy and nauseous, however the effects do not result in any permanent harm to the wolf.

Squirrel Proof Birdseed Products work in the same way. Without harming the squirrels, they soon associate not only the smell of the hot birdseed with the discomfort of eating pepper coated seed, they also begin to avoid all the stimuli associated with that seed, specifically, the feeder itself.

Birds, on the other hand, having no capsaicin (pepper) receptors will not be conditioned to avoid the birdseed that contains chili pepper

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Why is Pavlov's work so important?

(1) Many responses to stimuli can be classically conditioned in many organisms. C.C. is one way that almost any organism can learn to adapt to their environment.

(2) Pavlov showed how learning can be studied objectively. This also helped Psychology develop as a science.

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Application of Classical Conditioning...

- former drug addicts often counseled to avoid settings associated with previous drug use
- When taste accompanies a drug that affects the immune response, the taste itself may come to produce an immune response.
- Lack of acetylcholine causes difficulty with conditioning in some animals and Alzheimer's patients. This has motivated a search for a drug to enhance conditioning and perhaps delay Alzheimer's...

Contradictions:
Rats will learn to avoid the food that made them ill even if the illness happens hours after eating it.

Rats will dislike the taste that made them ill but not the sight of the food.

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