Section 2 - Behavior Modification
Section 2.2 - Reinforcement

Positive versus Negative Reinforcement

Wiki - reinforcement is an increase in the strength [or frequency] of a response following the change in environment immediately following that response (see Cooper, et al., 2007).

We have learned that reinforcement occurs when a consequence following the behavior increases the likelihood that the behavior will occur in the future under similar circumstances. We have also learned that the consequence can involve stimuli that are pleasing and stimuli that are aversive. Recall as well that we refer to the stimuli as pleasing or aversive and avoid using the valence terms positive and negative because they are reserved words and will be used elsewhere. We use these terms now to discuss the difference between positive reinforcement and negative reinforcement. Some of the material in this chapter is review and will serve as a basis for the new information you are about to learn. While this seem redundant at first many things that we learn such as math, languages, computer programming, etc. is redundant because it builds on itself. The same is true with behavior modification.

Positive Reinforcement

Positive reinforcement is the introduction of a desirable stimulus, contingent upon emitting a target behavior, with the goal of increasing the frequency of a response. With positive reinforcement we are introducing a desirable stimulus. Most reinforcement procedures involve positive reinforcement.

Verbal Praise is used in positive reinforcement. “Good job, Nice work, etc.” (consequences) are what an employer or co-worker might say to you for making a sandwich for a customer using the correct proportions of ingredients (target behavior).

A parent providing a child the opportunity to watch a favorite T.V. program (consequence) once their homework is completed (target behavior).

Receiving a $5 tip (consequence) from a bar customer for making their cocktail according to their specifications (target behavior).

Praise, watching TV, and tips are generally something we want and are reinforcing when they are given (added) to us as positive reinforcement.

Negative Reinforcement

Negative reinforcement is the removal of an aversive stimulus, contingent upon emitting a target behavior, with the goal of increasing the
frequency of a response. Negative and positive reinforcement only have in common the increasing the behavior as a result of a consequence.

Your car insurance agency lowers (takes away) your monthly payment by 25% (consequence/removal of an aversive) for having a clean driving record free of moving violations for six months (target behavior).

Your significant other stops leaving you annoying voicemails on your phone (consequence/removal of an aversive) the day after you mowed the lawn (target behavior)

You stop blowing a high-pitched whistle (consequence/removal of an aversive) after your dog begins to sit on the floor (target behavior) instead of the couch.

Write 1) a target behavior an employer might want to increase, 2) write use of positive reinforcement and 3) negative reinforcement for that behavior.

1. 

2. 

3. 
Conditioned v. Unconditioned Stimuli

While the principles and contingencies of reinforcement and punishment refer to Operant Conditioning, which was established by B.F. Skinner, another type of conditioning exists. Classical Conditioning, which led to the emergence of scientific behaviorism as a major subfield of psychological research, was largely the
result of work by Ivan Pavlov, a Russian physiologist. Pavlov was examining the digestive systems of dogs in his laboratory when he discovered something interesting that would lead to a plethora of knowledge regarding principles of how organisms learn based on simple stimuli found in a particular organism’s environment.

Pavlov had discovered that when placing meat powder in front of the dogs, their saliva glands would cause the dogs to start drooling. The meat powder caused the dogs to drool in the absence of any additional stimuli. In other words, the meat powder is sufficient to elicit a drooling response, due to the detection of a food stimulus in the environment (i.e., the chemical interaction of smelling the meat powder led to the production of saliva).

This response to the meat powder is based on the dog’s inherent biological mechanisms which cause the dog to drool in response to stimuli (i.e., the meat powder) which could lead to satisfying a biological need (i.e., hunger).

In the course of his experiments, Pavlov began to notice that the meat powder was not the only stimulus that elicited salivation. Pavlov began to notice that when he used a bell to signal to the dogs that it was feeding time, the dogs began to drool. Eventually, the dogs began to drool in response to the ringing of the bell without the presence of the meat powder.

What does this mean?

Pavlov’s observational and experimental findings indicate that a variety of stimuli can be conditioned to produce a given basic reflexive response. In the previous example, the meat powder is considered an unconditioned stimulus (UCS), because it elicits a natural drooling response from the dogs, called an unconditioned response (UCR). These responses are referred to as unconditioned because they are innate and do not have to be learned. The behaviors are reflexive in nature.

However, when the meat powder (UCS) is repeatedly paired along with the tone of a bell, the bell will eventually elicit the drooling response from the dogs. When the bell, in the absence of the meat powder, elicits a drooling response from the dogs, the bell is referred to as a conditioned stimulus (CS) and the drooling. This is because the animal essentially was taught or conditioned to drool at the sound of the bell. When the drooling occurs solely in response to the ringing of the bell, it is referred to as a conditioned response (CR). It is a conditioned response because the response to the bell was learned. We can think of conditioning as learning.

An association between the bell and meat is learned (conditioned) and the drooling as a result of the bell too is learned (conditioned). Once
conditioned, the bell (CS) is the only stimulus required to elicit a drooling response from the dog (CR).

This influential work by Pavlov will be discussed in greater detail on a different section. However, Pavlov’s work has implications for the following section regarding primary reinforcers (i.e., unconditioned) and secondary reinforcers (i.e., conditioned) which are associated with operant conditioning and behavior modification principles.

Primary Reinforcer

Wiki: A primary reinforcer, sometimes called an unconditioned reinforcer, is a stimulus that does not require pairing other stimuli to function as a reinforcer. A primary reinforcer has most likely has obtained this function through the evolution and its role in species' survival. Simply put, primary reinforcers are biologically relevant.

Examples of primary reinforcers are water, food, sex, air. Each of these we need in order to survive. Additionally, there is a brain structure, called the hypothalamus, specifically devoted to the motivation toward these primary reinforcers for the purposes of regulating normal functioning of
the body. Other primary reinforcers meet safety needs and social needs. These are all basic needs according to researcher Abram Maslow. Primary reinforcers are unconditioned, whereas secondary reinforcers are conditioned.

**Secondary Reinforcer**

Wiki: A secondary reinforcer, sometimes called a conditioned reinforcer, is a stimulus or situation that has acquired its function as a reinforcer after pairing with a stimulus which functions as a reinforcer.

Pets are very much attuned to the reinforcers in their lives. Food, access to the outside, attention, and sleep are some rather salient reinforcers. Some environmental stimuli can take on the function of a reinforcer because it becomes associated with the reinforcer by either preceding it or accompanying the reinforcer. Similarly to the bell that preceded the food delivery in the Pavlov example. We will read later on that animal trainers will use conditioning to ‘charge’ clickers (the make a clicking noise) that are used as secondary reinforcers for animal training. To do this they click on the clicker and then give the animal access to a small amount of food (they don’t want to satiate them).

We can also see some unintentional conditioning of secondary reinforcers when kittens weaned on canned food soon become keenly aware of the noise associated with the can opener. Because the sound of the can opener is associated with food, we can use the can opener to “call” the cat to the kitchen. This is a good thing to be able to do since many cats are not trained to come when you call them – although they can be.

For pets footsteps down the stairs in the morning can also become secondary reinforcers when they are associated with either getting attention or associated with access to the outside for the pets to relieve themselves in the morning. My pet rats are conditioned to the shuffle of my slippers. The come out of their cage and sit on the top waiting for a little snack or pat on the head.

A good way to think of secondary reinforcers is to ask yourself. If this stimulus occurred in absence of any conditioning, would it be reinforcing? Thus a secondary reinforcer has little to no value until it takes on the value or function of the primary reinforce is has become associative with. Some examples are the lunch bell – if you never heard a lunch bell before you wouldn’t know what it was for; green light at a traffic stop - if you never drove before the lights at the traffic stop would have little meaning; ice cream truck – if you never experience the arrival of an ice cream truck the music they play would have little value to you. You surely wouldn’t run into your house looking for change to buy a snow cone where you heard the music off in the distance.
Write 3 examples of secondary reinforcers that occur in the world.

1. 

2. 

3. 

Write 3 examples of secondary reinforcers that occur in present personal life.

1. 

2. 

3. 
Generalized Reinforcer

Wiki - A *generalized reinforcer* is a conditioned reinforcer that has obtained the reinforcing function by pairing with many other reinforcers (such as money, a *generalized secondary reinforcer*).

Money is an often used example of a generalized reinforcer. The fact that money has reinforcing properties no one would argue with. Money is said to *generalize* because you can acquire other reinforcers quite easily with money. In some ways money is a better reinforcer than some primary reinforcers, 1) money is easy to store and carry around, 2) money is not perishable, 3) not everyone likes the same primary reinforces (hamburgers or meat even). Secondly, money allows people to acquire whatever primary reinforcer they like whenever they like for the most part.

Other generalized secondary reinforcers are debit cards (you can buy primary reinforcers), discount coupons (they make it easier to acquire specific primary reinforcers), and poker chips for example (you can cash them in for money). Secondary reinforcers have their draw backs though. The drawbacks of a debit card is that you need to have ID when purchasing something and the person or business needs to be able to accept debit cards (you can’t pay Alison the $10.00 you owe here with a debit card). Discount coupons expire and they are only good for the specific item. Poker chips are worthless one you leave Las Vegas.

**Write 3 examples of secondary reinforcers that might be relevant to a dog.**

1. _______________________________________________
   _______________________________________________

2. _______________________________________________
   _______________________________________________

3. _______________________________________________
   _______________________________________________

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In later chapters we will discuss how points and poker chips can function quite well as reinforcers in what is called a token economy.

In the following table, please indicate whether the reinforcers listed in the left column are primary or secondary reinforcers, by placing an X in the box under the primary or secondary column.

List 3 other generalized secondary reinforcers and their benefits.

1. 
   
   
2. 
   
   
3. 
   
   

What are some of the drawbacks of the generalized secondary reinforcers you listed?

1. 
   
   
2. 
   
   
3. 
   

In later chapters we will discuss how points and poker chips can function quite well as reinforcers in what is called a token economy.
Context Matters!

The context which you are in often dictates whether or not a primary or secondary reinforcer will actually have reinforcing properties. For example, if you are in a different country, your secondary or generalized reinforcer of American dollars might not allow you to obtain a primary reinforcer (e.g., food). We still have Euros left from a trip to Ireland - Hy-vee won’t accept them.

Sure, you can probably exchange your dollars for the currency specific to the country you are in, but still, the reinforcing value of the dollar in these instances is essentially null and void. And no one wants to get Canadian dollars back for change when they buy gas at the Kwik Star in Cedar Falls, Iowa.

Here is another example to consider, some establishments that do not accept checks. Checks represent the amount of money that you have stored in a bank somewhere, but you don’t directly have that money at your disposal. Rather, your purpose for having checks is to be able to provide as much money as you need to attain something that is a primary reinforcer.

You may have experienced this before at a restaurant. You order your drinks, meal, and enjoy all of these reinforcers, yet when it comes time to pay for them, you produce your check book, to which your server responds, “Oh, sorry, we don’t take checks.”

The same situation can occur at cash only establishments (e.g., some bars), that do not allow you to use a credit or debit card as a means of paying for the reinforcers you have obtained. It is even worse when you have already consumed the primary reinforcer and you can’t put it back - at least not in its original form.

Intrinsic v Extrinsic Value

Both primary and secondary reinforcers have intrinsic and extrinsic value.
Intrinsic refers to the value that the individual places on something. Extrinsic refers the value others place on something. These terms are also used in reference to money. The intrinsic value of a one hundred dollar bill is the value of the paper it is on. The extrinsic value of a one hundred dollar bill is the overall amount of reinforcers (goods and services) that others are willing to trade for it.

Behaviorally, while certain reinforcers have a generally agreed upon value depending on what context you are in (e.g., money), the value of other reinforcers differs depending on their intrinsic value (important to the individual organism for its own sake) or extrinsic value (important because they have been established as socially/culturally valued).

A given culture may find value in certain reinforcers (e.g. good grades, food made from cow brains – called sesos), thus making those reinforcers extrinsically culturally important, due to the shared valued placed upon such reinforcers.

Individuals within that culture, however, may or may not value certain reinforcers (e.g. good grades, tacos de sesos) that are valued by many, because, for them, these reinforcers may or may not be intrinsically important.

Despite the low intrinsic value of a given reinforcer, however, the extrinsic value of that reinforcer may still lead an individual organism to strive toward attaining a particular reinforcer (e.g. good grades, we’ll leave the sesos out of the example this time).

Of course, the opposite could be true regarding the intrinsic versus extrinsic value of a reinforcer. Take for example, illicit (not elicit) drug use. Drugs as reinforcers may have low extrinsic value due to societal conceptions and regulations of the use of such substances. On the other hand, drugs as reinforcers may have a very high intrinsic value for an individual using the drug. For example when Rush Limbaugh was addicted to pain killers, those drugs had a high intrinsic value to Rush and a low intrinsic value to us since we don’t do drugs.
Primary and secondary reinforcers can have either a limited or broad value. Certain reinforcers (e.g., chewing gum) may have a limited value in that they “wear off” relatively quickly. Other reinforcers (e.g., effective health care) may have a broad value which is useful beyond the immediate value obtained via its initial reinforcing properties.
Further, reinforcers of limited value may only be beneficial in certain contexts, whereas reinforcers of broad value may be applicable and hold their value in a variety of contexts (our example was currency). The main thing to remember here is the context or situation, the organism, the reinforcer, and the relationship between all of these components matters, especially in determining the effectiveness of a given reinforcer.

**List three reinforcers that have limited value.**

1. 

2. 

3. 

**List three reinforcers that have broad value.**

1. 

2. 

3. 
In summary:

- Positive reinforcement involves introducing a pleasing stimulus as a behavioral consequence to increase the behavior.
- Negative reinforcement involves the removal of an aversive stimulus as a behavioral consequence to increase the behavior.
- Skinner is associated with operant conditioning while Pavlov is associated with classical conditioning.
- Responses and stimuli are referred to as unconditioned when they do not have to be learned.
- Responses and stimuli are referred to as conditioned when they do not have to be learned and are associated with unconditioned stimuli.
- Primary reinforcers serve our basic needs and are considered to be unconditioned. They are biologically relevant.
- Secondary reinforcers are associated with primary reinforcers. They are referred to as conditioned reinforcers.
- Generalized reinforcers are used to acquire other reinforcers. Money and ATM cards, and gift cards are some examples of generalized reinforcers.
- Context is important as some stimuli may lose their reinforcing properties depending on their context. Example foreign currency.
- Reinforcers can have both intrinsic and extrinsic value.
- Reinforcers can have limited and broad value.
Keep in mind that the drooling response can be either a CR or an UCR – it basically depends on what elicited the drooling reflex. If the bell (CS) triggers the drooling reflex, then the drooling is a CR. If the food elicits the drooling reflex, then the drooling is referred to as an UCR.