V. LEARNING

A. DEFINITION OF LEARNING

How old are you? We're going to guess that many of you working on this packet are at least 16 years old. Can you imagine how many things you have learned up to your current age! We're not just talking about learning through public education, but everything you have learned since you were born! Your long list includes things such as: nursing, eating solids, walking, talking, reading, colors, numbers, the alphabet, your name, how to dress, how to eat at the table, walking to school, and the list goes on and on.

The ability to learn, though not unique to humans, nevertheless, makes us human. How do we define learning? Learning can be defined as **a permanent change in our thoughts or behavior due to experience**. For example, there are some things that you knew how to do upon exiting your mother's womb - things like blinking, sucking and breathing. But there are countless things that we need to learn through experience, including but not limited to the things mentioned above.

How does this process take place? For many of you, learning took place when someone taught you verbally, or when you watched someone, or when you learned by trial and error. Psychologist have isolated four different types of learning that we experience, these are: **classical conditioning**, **operant conditioning**, **social learning**, and **cognitive learning**. Classical conditioning refers to learning that takes place automatically from linking one event to another. Operant conditioning is learning based upon our actions or trial and error. Social learning takes place when we observe and copy people. Cognitive learning is learning that takes place through our cognitive processes. We will be discussing each one of these learning types in this packet.

Reading Check

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Teacher's Signature

Learning Check

Answer the following questions:

1. What is the definition of learning?

What are the four types of learning?

2.

3.

4.

5.

Activities for Definition of Learning

IMPORTANT!: In addition to completing the required activities, you will need to complete five other activities for this packet. 100 points possible.

1. *On one sheet of paper and on one column, type out a list of things that you have learned since you were born. On the other columns, list the things you already knew how to do at birth. Refer to packet for examples if necessary.

2. Are there any others ways that we learn things that the psychologists have not taken into account? Respond on one typed page.

B. CLASSICAL CONDITIONING

To help introduce classical conditioning, let's conduct an experiment. You will need a partner, straw (preferably a milk straw) and a noise making device-a bell would be perfect. With your partner sitting down and you facing the side of his head, take the straw and blow a quick puff of air into the outside corner his eye. Go ahead. What happened? Unless your partner is a mutant, he probably blinked. Do this a couple more times to make sure this reflex is working normally. Now here comes the fun part. Before each blow, ring the bell and then blow immediately following the bell. Keep doing this until he starts to blink at just the sound of the bell! You might have to try to fake him out a few times by just ringing the bell and not blowing at all. Did it work? Chances are that this experiment worked. You have just classically conditioned your partner!

Let's dissect this experiment and put some labels on some of its elements.

The puff of air that you blew into your partners eye is called an **unconditioned stimulus**. A **stimulus** is anything that elicits (causes) a response. **Unconditioned** means that you did not need to train the eye to blink at the puff of air. This response came naturally. That is why the blinking response is called the **unconditioned response**. A **response** is a reaction to a stimulus (IE, blinking).

Now, let's talk about the bell. If you were to ding the bell in front of your partner before the experiment, chances are good that he wouldn't blink. That's because the bell at this point of the experiment is a **neutral stimulus**. Neutral stimulus means that this stimulus is neither eliciting or stopping a response. It is neutral. But as we continue the experiment, something remarkable takes place.

As we pair the bell stimulus and the blowing stimulus, your partner begins associate one stimulus with the other. In other words the neutral stimulus begins to elicit the same response as the unconditioned stimulus. Once this occurs, the neutral stimulus becomes a **conditioned stimulus** and the blinking it elicits becomes a **conditioned response**. The reason they are called conditioned now is because your partner had to be "conditioned" or trained to respond this way. It didn't come naturally. This is classical conditioning. Let's get a definition for classical conditioning. We defined it in the last objective - let's get more specific.

Classical conditioning is a form of learning that automatically takes place when a natural or unconditioned stimulus is paired with a neutral stimulus. Learning or conditioning has taken place when the neutral stimulus, now a conditioned stimulus, elicits the same response (now a conditioned response) as the natural stimulus.

The person who accidently discovered classical conditioning was a physiologist named **Ivan Pavlov**. He was actually doing research on how salivation and gastric juices aid in digestion when he stumbled upon this discovery. With a tube connected to a dog's salivary glands on one

end and a meter to measure the amount of saliva on the other, Pavlov set out to see how salivation helped in the digestive processes. Everyday, Pavlov and his assistance would bring food to the dogs. When the dogs saw the food, they naturally salivated. After doing this for a few weeks, to the surprise of Pavlov, just the sight of him or his assistants would cause the dogs to salivate. Also, the sounds of the food being prepared also brought about salivation. Little did Pavlov know, that the dog associated the other stimuli with the sight of the food.

Like any good researcher, Pavlov at this point, altered his experiment. He would now investigate this new found phenomenon by introducing the sound of a bell before feeding time. In no time, the dog begin to salivate at the sound of the bell. Thanks to Pavlov's curiosity, an important type of learning was discovered.

Classical Conditioning in Your Life

You're probably wondering right now if you have been classically conditioned in your life. Let us ask you some questions now and see if these situations apply to you.

When you are sitting in class, do you start to fidget and get ready to leave when you see a classmate start packing up their books? If you have, you have been classically conditioned. Packing up your bags becomes associated with the bell ringing. Since bell ringing means a class change, seeing classmates pack up causes you to think that the bell is going to ring.

Have you ever had a cousin, uncle, brother, dad or friend who enjoyed hitting you when you weren't looking. Chances are, you flinch whenever they take a swipe at you. After awhile, the mere presence of them makes you flinch. That's because you have associated their presence with them hitting you!

Do you have a pet? If yes, notice how they act right before feeding time. How do they always know that you are just about to feed him. Apparently, your pet has associated certain sights, smell and sounds with their food. The sound of the can opener is a perfect example.

There are some things that don't require repetition in order for you to become classically conditioned. Mainly because the association is so strong that you cannot forget. For example, have you ever gotten sick after eating a certain food? If you have, you probably avoid that food like the plague. Most likely, it wasn't the food that got you sick, but because you associated the food with your illness, you associated the two events. This is called a **food aversion**.

Smells tend to become classically conditioned as well. Certain odors seem to invoke memories associated with that smell. If any of you have a boy or girl friend that wears a certain cologne or perfume, you know exactly what we are talking about. Just a whiff of their "scent" evokes either positive or negative memories of the person the scent belongs to.

These are just a few of the thousands of associations you have made throughout your life. Can

you think of any other?

Extinction

Now, just because you have associated one event with another does not mean that you are forever conditioned. If your friend has not taken a swipe at you for three years, your flinching when he walks in has probably ceased. When a conditioned stimulus no longer elicits a conditioned response, **extinction** is said to have occurred. This is a very practical response since it would definitely be maladaptive to continue to respond when it was no longer necessary.

Spontaneous Recovery

Extinguishing a response forever is not easy. Let's say you haven't seen your punchy friend for a month and then run into him. You might flinch again just because that feeling of fear has returned. The return of a conditioned response after it has been extinguished is called **spontaneous recovery**.

Songs are a perfect example of this phenomenon. Usually when you like a song, you listen to it over and over again until you get sick of it. After a while, you put the song away. Well a months passes and you hear the song being played on the radio. The same feelings associated the song come back.

Reading Check

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Teacher's Signature

Learning Check

Please answer the following questions:

1. What is classical conditioning?

2. What is a response?

3. What is a stimulus?

4. What is an unconditioned stimulus?

5. What is an unconditioned response?

6. What is a neutral stimulus?

7. What is a conditioned stimulus?

8. What is a conditioned response?

9. Who is Ivan Pavlov?

10. What is extinction?

11. What is spontaneous recovery?

DIRECTIONS: For each situation, please label or write down the unconditioned stimulus (us), unconditioned response (ur), conditioned stimulus (cs) and conditioned response (cr). Also write down the neutral stimulus.

1. Whenever Michelle notices the scent of old socks, fond memories of her experiences in her high school psychology class return.

2. Whenever Anne hears "elevator" music, she gets a chill up her spine. Apparently her dentist plays this music whenever she goes in for a cleaning.

3. Whenever Adam walks by Joey, he always flinches. Joey made it a habit of periodically kicking Adam in the groin whenever he saw him.

4. Spencer would feel nauseous whenever he encountered raspberries. Spencer got sick once eating raspberries when he was five years old.

5. Whenever Eean hears the word "for", he cowers in fear. Apparently, he was hit by a golf ball once while someone was yelling "fore!"

Activities for Classical Conditioning

1. *Please describe examples of classical conditioning in your life. Two pages
2. Type a 2-3 page research paper on Ivan Pavlov.

3. Describe a fear that you once had that is pretty much extinguished today. Why or how was the fear extinguished? One typed page.

4. One day little Theodore is extremely startled when he hears the doorbell, and he begins to cry uncontrollably. Unfortunately this continues for the next few days. How would you extinguish this fear? One typed page.

C. OPERANT CONDITIONING

Learning in classical conditioning takes place wether we want it to or not. We make associations between stimuli everyday. Unless we can control every bit of stimuli that we experience, classical conditioning is inevitable. But there is a type of learning wherein we have greater control. This type of learning is called **operant conditioning**. Operant conditioning is conditioning that results from one's actions and the consequences they cause. For example, we tend to learn certain "operations", actions or responses when it is followed by some sort of reward and we tend to avoid certain operations when it is followed by a punishment or no reward at all. How does this whole process work? In order to understand the process of operant conditioning, we need to understand some very important terms.

Reinforcement

A **reinforcement** is anything following a response that has a tendency to strengthen that response. If your parents give you money for good grades, the money is a reinforcement because it strengthens your response - getting good grades.

There are two different types of reinforcements: **primary reinforcements** and **secondary reinforcements**. A primary reinforcement is a reinforcement that is necessary for psychological/ physical survival. An example of this would be food or water. If getting food was a reinforcer for getting good grades, then we're sure you'll work very hard to get "A"s.

A secondary reinforcer is any reinforcer that comes to represent a primary reinforcer. For example, instead of giving you food for good grades, We're going to give you tokens. As soon as you earn ten tokens, you can exchange them for food. Money is a good example of a secondary reinforcer since you can use it to purchase primary reinforcers.

To reiterate, the goal of the reinforcer is to increase a desired behavior. This can be done through two different techniques: **positive reinforcements** and **negative reinforcements**. A positive reinforcement is when a primary or secondary reinforcement is given (+, positive) after a desired action is performed with the goal of increasing the occurrence of that action. The reinforcement must be something that is desirable to the organism or it will not have the desired effect. Getting money for grades is an example of a positive reinforcement.

A negative reinforcement is when something unpleasant is taken away (-, negative) once the organism does the desired behavior. Let's say that your mother nags at you practically 24 hrs a day to clean your room (cleaning your room is the desired behavior). You will finally clean your room to stop the nagging. Her nagging is a negative reinforcement. Don't forget that the goal of both positive and negative reinforcement is to strengthen a desired behavior.

Punishment

The goal of punishment is very different from the goal of reinforcements. Remember, the reinforcement's goal is to strengthen a desired behavior. The goal of **punishment** is to weaken an undesirable behavior. This is accomplished in two ways: by taking away something pleasant or adding something unpleasant. Let's go back to the example of grades. If your mom wanted to punish you for bad grades, she would either take away your car (something pleasant is removed) or give you an electric shock (something unpleasant is added). The goal of both is to weaken the undesirable behavior - getting bad grades.

Extinction

As with classical conditioning, extinction can take place if your desired behavior is not followed by a reinforcement. Some of you might disagree with this notion. "What about things that I keep doing that no one rewards me for?" That is a very good question. Just because no one gives you reinforcement doesn't mean that you are not being rewarded. In fact rewards can be grouped into two categories: **extrinsic** and **intrinsic**. An extrinsic reward is a reward that is given to you from your environment (money for your grades). An intrinsic reward is reward that comes from within the organism (a sense of satisfaction for having good grades). The goal of all of us should be to do things for intrinsic rewards.

Schedules of Reinforcement

All of the examples of reinforcement we have used so far have been examples of **continuous reinforcement**. This means that for every desired behavior exhibited by the creature, a reinforcement is given. The problem with reinforcing in this manner is that the creature will learn to only do the behavior if a reinforcement is given. This problem can be avoided by using a **partial reinforcement schedule**. This means that we will not reward the creature every time it exhibits the desired behavior but only periodically. There are different ways or techniques of using a partial reinforcement schedule. These different techniques are called **schedules of reinforcement** and there are four of them: **fixed ratio**, **variable ratio**, **fixed interval** and **variable interval**.

Fixed ratio When we are reinforcing on a fixed ratio schedule, we will give the organism one reinforcer for every certain number of desired behaviors exhibited. For example, your dog gets one treat for every three times he rolls over. Your little brother gets one piece of candy for every five times he gets your slippers. You get money (five dollars) for every five "A's" that you get on your report card.

Variable ratio This schedule of reinforcement is similar to the fixed ratio except that now the desired amount of behaviors exhibited by the organism will vary between each reinforcement. For example, sometimes your parents will give you five dollars for five “A’s” and sometimes they’ll give you five dollars for three “A’s”. The amount of desired behaviors will change every time before you get your next reinforcer. A slot machine is a perfect example of a variable ratio schedule. How many pulls of the slot machine’s arm does it take to get a jackpot? Who knows?!

Sometimes you could hit the jackpot with just one pull ("pulling being the desired behavior), while other times it will take 300 pulls. It will vary every time between jackpots (reinforcements).

Fixed interval The fixed interval schedule is different from the ratio schedules we have just discussed. While ratio is concerned with the number (ratio) of desired behaviors exhibited between each reinforcement, *intervals* are concerned with the amount of time that expires between each reinforcement. As long as the organism exhibits the desired behavior at least once, it will receive a reinforcement at the end of the time period (interval). In the fixed interval schedule, the organism, after exhibiting the desired behavior at least once, will receive a reinforcement after a fixed amount of time has expired. Here's an example. Do you have a job? How are you paid? Chances are, you are paid either weekly, bi-weekly or monthly. What that means is that after a set amount of time you receive a reinforcement - your paycheck. Unless your boss notices, does loafing at work effect the amount of pay you receive? Of course not. Your pay is based on how much time you put in, not how much work you do. As long as you show up and do something, your paycheck will be the same as that co-worker who works three times as hard as you. As you can see, this is not a very good system to motivate employees. Now here's a question for you. If you were paid on commission (pay based on the amount of work you do) what schedule of reinforcement is that? If you guessed fixed ratio, you are correct. If you don't understand why that is the answer, you need to go back and review.

Variable interval In a variable interval schedule, the principles are the same as in the fixed interval except that now the amount of time that expires between each reinforcement will change (vary). Fishing is an excellent example. If the desired behavior is casting out your line and the reinforcement is catching a fish, how much time will expire between each fish caught? Once again, who knows?! It could take hours or minutes between each fish. The main point is that it will vary every time. Does it matter how many times you cast your line out? Probably not. As long as you do it at least once (you need to have a hook in the water to catch fish), you will receive your reinforcement when the "time" comes. When the time is, only the fish know. Another good example of this is dating for girls. How long does a girl have to wait before she is asked out on a date? (We are assuming that being asked out is a reinforcement.) Does she need to wait one week, two months or three days? Again, we don't know. What about dating for boys? If a girl saying "yes" to you is a reinforcement, what schedule of reinforcement is it? If you chose variable ratio, you are correct. If you don't understand this, go back and review!

Reading Check

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Teacher's Signature

Learning Check

A. Please answer the following questions:

1. What is operant conditioning?

2. What is a reinforcement? Give me an example of one in your life.

3. What is a primary reinforcer? Give me an example of one in your life.

4. What is a secondary reinforcer? Give me an example of one in your life.

5. What is a negative reinforcement? Give me an example of one in your life.

6. What is a positive reinforcement? Give me an example of one in your life.

7. What is a punishment? Give me an example of one in your life.

8. What is an intrinsic reward? Give me an example of one in your life.

9. What is an extrinsic reward? Give me an example of one in your life.

B. For each of the following, please label each situation as an example of **fixed interval**, **fixed ratio**, **variable interval** or **variable ratio** schedule of reinforcement.

1. slot machine

2. fishing

3. turning in cereal box tops to get a toy

4. bi-weekly pay check

5. Factory workers get a break every three hours.

6. Gamblers never know how many times they need to bet in order to win.

7. Whenever you kick a vending machine three times, candy bars fall out.

8. Every once in a while, candy bars fall out of the vending machine.

Activities for Operant Conditioning

1. Create a chart explaining the different schedules of reinforcement. Make sure your chart has at least one graphic for each of the schedules of reinforcement. (Hint: the chart on page 200 of your textbook is a good example of one. Don't copy it but you can do something like it.)

2. If you have a pet, train him to do a new behavior using the principles of operant

conditioning. Keep a journal of the whole experience. Your journal should tell us what you are training your pet to do and which reinforcement schedule you are using. It should also include the types of reinforcements you are using, whether they are secondary or primary and positive or negative. Are you using any form of punishment? The journal also needs to contain a daily log of the training sessions. When you are confident that your pet has learned the desired behavior, bring him to class for a demonstration along with your journal to be handed in. This activity counts as <u>two</u>.

3. Type a 2-3 page research paper on B.F. Skinner.

4. Is spanking an effective way to teach children? Write a research paper on the use of corporal punishment (spanking) in schools and home. 2-3 pages typed.

5. Do the principles of operant conditioning work on human beings? Try the experiment in #2 on a person. Follow the exact same guidelines for training and journal requirements except that you don't need to bring in the human for the demonstration part.

6. *Do you learn best through positive reinforcement, negative reinforcement or punishment? Which method do authority figures (parents, teachers, bosses, IE...) use the most? Include examples from your own life in this paper. 1-2 pages typed.

7. According to operant conditioning, people continue to perform certain behaviors mainly because of the reinforcement they receive. This applies even to bad habits. Name one of your bad habits. What are several possible reinforcements that you receive for performing the habit? How would you remove or change some of these reinforcements and possibly extinguish the bad habit? Here's an example: habit = biting nails; reinforcement = relieves tension; removing reinforcement = apply bitter-tasting polish to nails. One typed page.

8. If you wanted someone to become addicted to watching television, which schedule of reinforcement would be most effective? Explain. Which schedule would be least effective? Explain. One page typed.

D. SOCIAL LEARNING

Experiment time! You will need two or more people to help you out. The only requirement is that they will need to have shoes on with laces on them. Here's what you need to do. Pick out a teacher from your group and have everyone else untie their shoes. With their shoes untied, have the teacher verbally instruct them on how to tie their shoes. The teacher cannot use his hands or use any visual example. Everything must be done verbally. Those who are listening to the instructions need to pretend that they have never tied their shoes before. Give it a try! How are they doing? Probably not very well. Seeing is worth a thousand words when it comes to learning. This is the main focus of what we call **social learning**. Social learning is learning that takes place through **observation** and **modeling**. In other words, it is the learning that takes place when we watch (observation) and imitate (modeling) other people. The reason why it is called "social" is because people obviously need to be present in order for this learning to take place.

The main theorist behind social learning is a psychologist named **Albert Bandura**. Bandura believed that Pavlov, Watson and Skinner's learning theories were too robotic. He felt that their was an "inner-person" that evaluated, analyzed and decided upon each event. To Bandura, it was not necessarily automatic. In a now famous experiment, Bandura demonstrated how people can learn behaviors (albeit not always positive) through observation and modeling. The experiment involved a group of children observing adults "beating-up" inflatable plastic dolls named Bo-Bo. Following the observation, each of the children were placed in a room with a bunch of different toys, including a Bo-Bo doll. What do you think the children did? Not only did they beat-up Bo-Bo, but they did it in the same manner as the adults. (Look on page 204 of your text to witness for yourself.) As you can see, no reinforcement was required for these children to learn to beat-up Bo-Bo. Think about all the things that you have learned in your life through observing and modeling. No one had to reinforce you do it, you just decided to do so.

Reading Check

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Teacher Signature

Learning Check

Please answer the following questions:

1. What is social learning?

2. What is observation?

3. What is modeling?

4. What happened in the “Bo-Bo” experiment?

Activities

1. *On one typed page, tell us about all the things you have learned through observing someone else. Could you have learned it any other way. One page typed.

E. COGNITIVE LEARNING

Can you remember what the word "cognition" means? We talked about it in the first packet. If you don't remember, it means thinking. If you didn't noticed each of the learning theories, with the exception of Bandura's do not recognize thought processes in their conditioning. In the approach to learning called **cognitive learning**, our focus is on how mental processes (thinking) and previous knowledge (memory) aid in learning.

Complexities of Conditioning

Though classical conditioning and operant conditioning psychologist don't recognize it, the process of conditioning is not as straightforward as they would like us to believe. From their point of view, animals and people are conditioned like clockwork. This is just not the case. For example, when Pavlov was conditioning his dogs, some of them fell asleep when the experiment was just too boring for them. Clearly, these dogs were not conditioned! Just because your mom offers you money for good grades, is just no guarantee that you're going to get good grades. There is a lot of thinking and decision making on your part before you actually allow her offer to effect you.

Cognitive Maps

In the 1930s, psychologist **E.C. Tolman** argued that animals, rats in particular developed mental images of mazes when they were allowed to freely maneuver through one. According to his research, rats possessing these **cognitive maps**, spent less time locating food in these mazes than other rats not given the same advantage. Clearly the rats learned how to navigate through the maze without the use of reinforcers! Tolman concluded that learning took place (creation of a cognitive map) through complex mental processes. Tolman's research also uncovered the fact that rats even developed **strategies** (techniques for solving problems) of their own to help them navigate through the maze without unnecessary backtracking! Researchers have also tested chimpanzees with amazing results. Without any reinforcers to help, a baby chimp can learn a complicated maze while being carried through by an experimenter. Upon completion, the same chimp can locate an average of 12 out of 18 bananas deposited by the experimenter during their trip through the maze. From Tolman's research, it is clear that learning is not just a robotic response to reinforcement.

Reading Check

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Teacher's Signature

Learning Check

Please answer the following questions:

1. What is cognitive learning?

2. What is a cognitive map?

3. What is a strategy?

Activities for Cognitive Learning

1. *Get a large piece of unlined paper. In the center, put where you live. Try to draw your map to scale, but don't use a ruler. Pick two places away from your home, one to the right and one to the left of it, approximately the same distance away. One should be a place you don't like for some reason, the other place you have good feelings about. Draw a map of the streets from your home to each of these two places.

   After you have completed your map, turn to page 206 of your textbook to get an explanation of your map. Did it apply true for you?