MODULE SEVEN
LEARNING

Unit 11 – Learning and Adaptation – The Role of Experience

Reflect for a moment on how much of your behavior is learned: telling time, getting dressed, and driving, reading, using money and so on. Beyond such skills, learning affects our emotional reactions, perceptions, and physiological responses. Through experience, we learn to think, act, and feel in ways that contribute richly to our individual identity.

What is learning?

Learning is a process by which experience produces a relatively enduring change in an organism`s behavior or capabilities.

The term capabilities highlight a distinction made by many theorists: "knowing how" versus "doing." For example, experience may provide us with immediate knowledge (e.g. the boys learned how to apply a chokehold when they watched a wrestling match on TV), But in science we must measure learning by actual changes in performance E.g., later that day they began applying. Chokeholds to each other.

Therefore, the best definition of learning is that: learning is a relatively permanent change in behavior, and the frequency of its occurrence; this change is not automatic and results from practice or experience.

Learning is distinguished from behavioral changes a rising from such processes as maturation and illness, but does apply to more skills, such as driving a car, to intellectual skills, such as reading, and to attitudes values, such as prejudice.

MAJOR FORMS OF LEARNING

How do we learn.

Three main explanations of learning are:

- **Classical conditioning**
- **Operant conditioning**
- **Cognitive approaches to learning.**

Basic Terminology

Stimulus: A physical energy source that has an effect on a sense organ, thus producing a response.

Response: the action, behavior, or reaction triggered by a stimulus.

Environment: external factors, variable, conditions influences, or circumstance affecting one's development or behavior.

Variable: a behavior, factor, setting, or event that can change/ vary in amount or kind.

Reflex: an automatic, unlearned response resulting from a specific stimulus.

Un conditioned stimulus (UCS): A stimulus that elicits a response naturally.

Un conditioned Response (UCR): A natural, reflexive, reliable, response of the UCS.

Conditioned Stimulus (CS): A primary neutral stimulus which, when paired with the UCS, starts evoking a response.

Conditioned response (CR): After conditioning, the CS begins to elicit a new, learned response.

CLASSICAL CONDITIONING

Life is full of interesting associations. Do you ever hear songs on the radio or find yourself in places that instantly make you feel good because they are connected to special times you have had?

- Why are children scared of darkness?
- Why some children jump with joy at the sight of a cat and some start screaming in fright?
- Why does one coming from office start feeling relaxed at the very sight of his home?
- Why does one start feeling bad at the through of going to a dentist?
- Why does one starts feeling hungry at the sight of one's favorite fast food joint?

Classical conditioning provides answers to all these questions

Classical conditioning forms an association between two stimuli. For example, a song and a pleasant event, such that one stimulus (the song) comes to elicit a response (feeling happy) that originally was elicited only by other stimulus (the pleasant place)

As such, classical conditioning is when a stimulus acquires the ability to cause a response that was previously caused by another stimulus. This learning process essentially allows us to predict what is going to happen.

Historical Background

In 1879 Ivan Pavlov, the Russian physiologist and pioneer of classical conditioning, began his research work on the digestive process, primary that of dogs. The focal point of his investigation was the salivation reflex in dogs. It was already known that dogs would salivate if food powder were led into their mouths, as it was a reflex. ‘The dogs would salivate every time the food powder was presented. Pavlov observed that after some time, the dogs at times salivated just before food was put into their mouths. They also salivated at the slight of the food, and even at the slight of the lab assistant who brought food for them. This is where the concept of classical conditioning emerged.

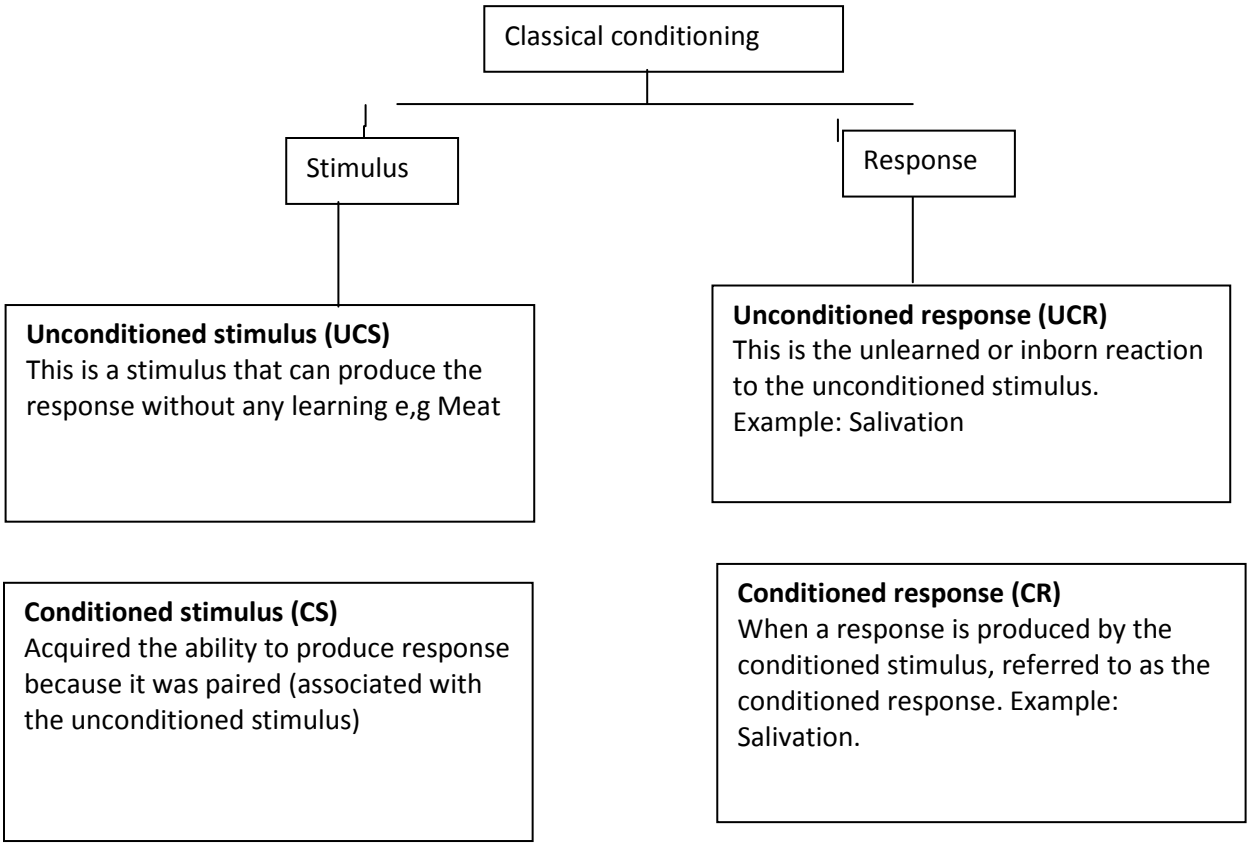
Pavlov`s standard procedure involved a quiet, distract free laboratory, which gave the experimenter full control over events experienced by a lightly restrained dog. From time to time the dog was given access to

food; and each presentation was accompanied (usually slightly preceded) by the occurrence of a neutral event, such as a flashing light. After several training trials (pairings of light and food), the dog would salivate at the flash of light, before any food had appeared. Salivation at the presentation of food is called an unconditioned response (UR), since it occurs automatically (unconditional). The food is an unconditioned stimulus (Us). The animal's tendency to salivate when the light flashes is conditional on the light having been paired with food, so this is referred to as a conditioned response (CR) and the event that evokes it as a conditioned stimulus (CS).the whole training procedure was labeled conditioning. As other forms of training, introduced later, have also been described as conditioning, Pavlov`s version became known as classical conditioning.

Types of Stimulus and Response

Remember that astimulus is an observable environment event that has a potential to exert control over a behavioral response. A response is an over behavior by a learner. Put it in a simpler way, a stimulus is anything that can directly influence behavior and the stimulus produces a response.

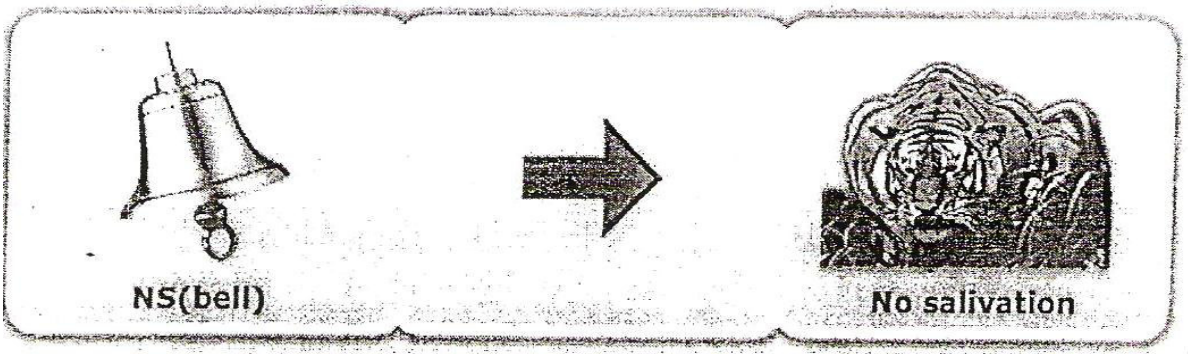
In classical conditioning, there are 2 types of stimulus and 2 types of response. They are unconditioned stimulus, conditioned stimulus, unconditioned response, and conditioned response as explained below:



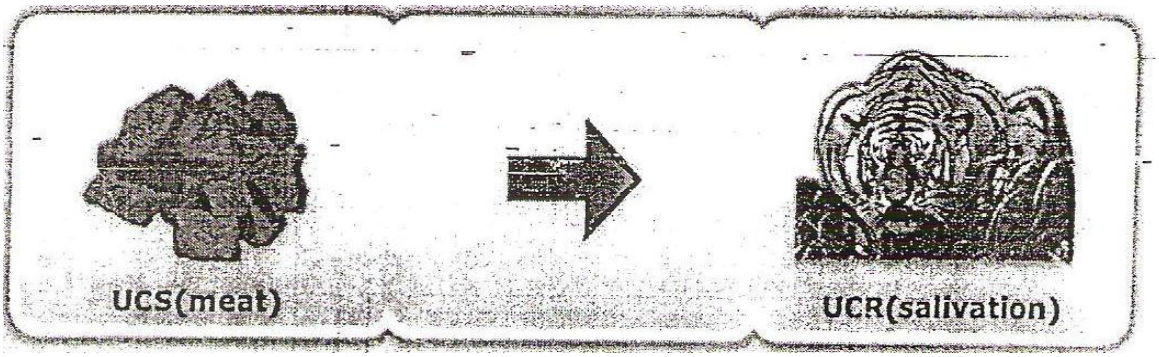
Look at the diagram below to help us understand the meaning of those stimulus and responses as well as the step in the process of classical conditioning.

Step 1 before conditioning

Before conditioning, the bell is a neutral stimulus. Neutral stimulus (Ns) is a stimulus that before conditioning, does not naturally bring about the response of interest (Feldman, 2005).

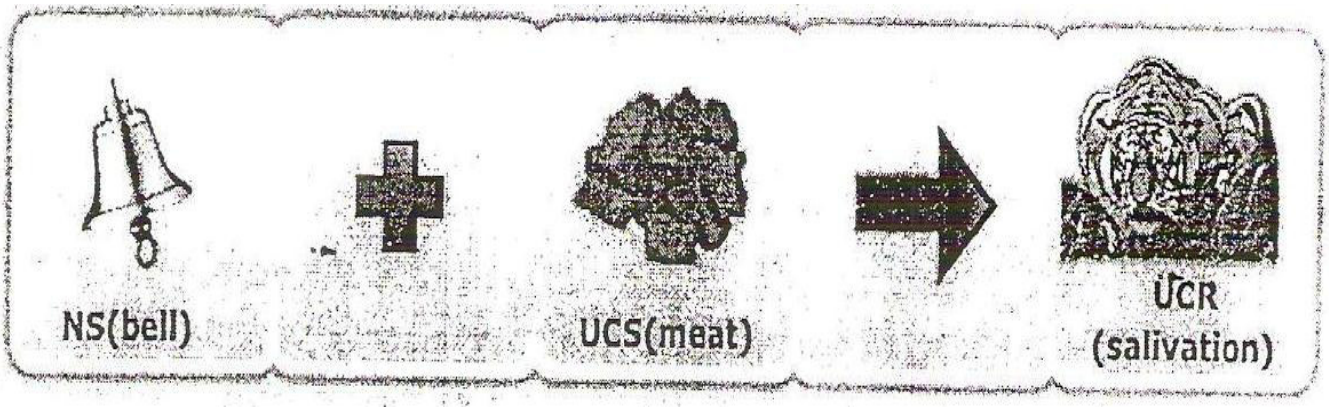


However, an unconditioned stimulus (UCS) can produce an unconditioned response (UCR).



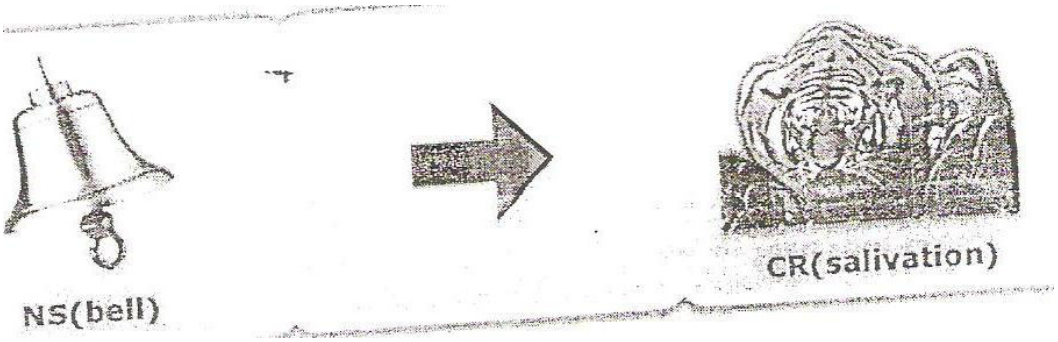
Step 2 – during conditioning procedure

During the conditioning procedure, the neutral stimulus (NS) is presented. It is immediately followed by unconditioned stimulus (UCS) to produce unconditioned response (UCR)



Step 3 test of conditioning

After the classical conditioning procedures, the neutral stimulus (NS) becomes a conditioned stimulus (CS). It alone can produce salivation. At the point, the production of salivation is known as the conditioned response (CR).



The importance of classical conditioning

If classical conditioning were simply a procedure that allows a reflex response previously solely by a particular US (such as food) to come under the control of another stimulus (such as the presentation of a light), then perhaps there would be no reason to regard it as fundamentally important to our understanding of learning. But three features of our analysis give us reason to believe that is fundamentally important:

It is fundamental to learning about the relationship among environment events. Sensory preconditioning tells us that when neutral stimulus co-occurs, an association forms between them. Simply moving through the environment will expose the human/ animal to sequences of events that

go together, and the associations that form among them will constitute an important piece of knowledge.

Classical conditioning is important because it allows exploration of the nature of associative learning. As such so many theories have been developed on learning.

Principles of Classical Conditioning

1. Acquisition
2. Extinction
3. Spontaneous recovery
4. Stimulus generalization
5. Stimulus discrimination
6. Higher order conditioning

1) **Acquisition**: the stage when the stimulus in question generates a conditioned response; this is the stage of initial learning when responses are established and then gradually strengthened as a result of repeated pairing and presentation.

2) **Extinction:** the unlearning of the conditioned response by weakening it, leading to its disappearance; for example using the same principles as those for learning the response. The state when the conditioned stimulus i.e. boll, buzzer. Gong e.t.c does not

accompany the unconditioned stimulus e.g. food. The response gradually diminishes, extinguishes, or declines, as the UCS repeatedly does not appear with the CS.

3) **Spontaneous Recovery**: does the response disappear permanently, once extinction, the dog salivated again on hearing the bell/ buzzer. Consider the case of someone who left but the very sight of someone else who is smoking makes him feel like smoking. The same may happen with a child whose fear than they initially were; similar to their extinction takes place sooner and easily.

4) **Generalization:** stimulus similar to the original CS may happen elicit same response as to the CS or UCS e.g. a buzzer responded to as a bell. Pavlovian experiments showed that the dogs also salivated on the tones that were similar to the original ones. Consider the case of Albert`s fear of all white – furry objects.

5) **Discrimination**: the process whereby the organism learns to restrict its response to one specific stimulus; differentiating between similar stimuli. Pavlov`s dogs salivated only at the tones, which were similar in nature. Consider the case of a child who is scared of the neighbor`s dog alone (that barks every time the child passes by), and not all dogs.

6) **Higher order conditioning:** a process when a already conditioned stimulus is repeatedly paired with a neutral stimulus, and ultimately the neutral stimulus begins to evoke the same response as to the original stimulus. Consider the case of a child who was scared of the neighbor`s dog, became scared of all dogs, and finally started screaming at the mere name of a dog.

Applications of classical conditioning in everyday life

Negative emotional response: fears, phobias fear of reptiles, dark places and school phobia.

Positive emotional response: feelings of relaxation, and happiness….thinking of going on a holiday.

Advertising: associating model with the product.

Psychotherapy; systematic desensitization, aversive therapy.

Conditioned Drug response: vomiting inducing drugs were repeatedly paired with the sound of a tone; eventually the mere sound of that name of cough syrup, or who faint at the name of a clinic. Smoking, coffee, and tea people who are additicted to caffeine and nicotine start feeling relaxed and stimulated even before the intake.

Over eating: most obese people start feeling hungry at the sight of a restaurant or at the smell of food.

Applying classical conditioning in counseling

The key element in classical conditioning is association. Therefore, counselors are encouraged to associate variety of positive and pleasant events with learning and counseling activities. For example, a counselor may:

- Use of attractive learning aids.
- Decorate the counseling rooms with appropriate pictures.
- Encourage clients and smile at them when they come for counseling.
- Inform the clients clearly and specifically the format of tests, and assignments.
- Make the clients understand the procedures of counseling.
- Give ample time for clients to prepare for and complete the learning tasks.

OPERANT CONDITIONING

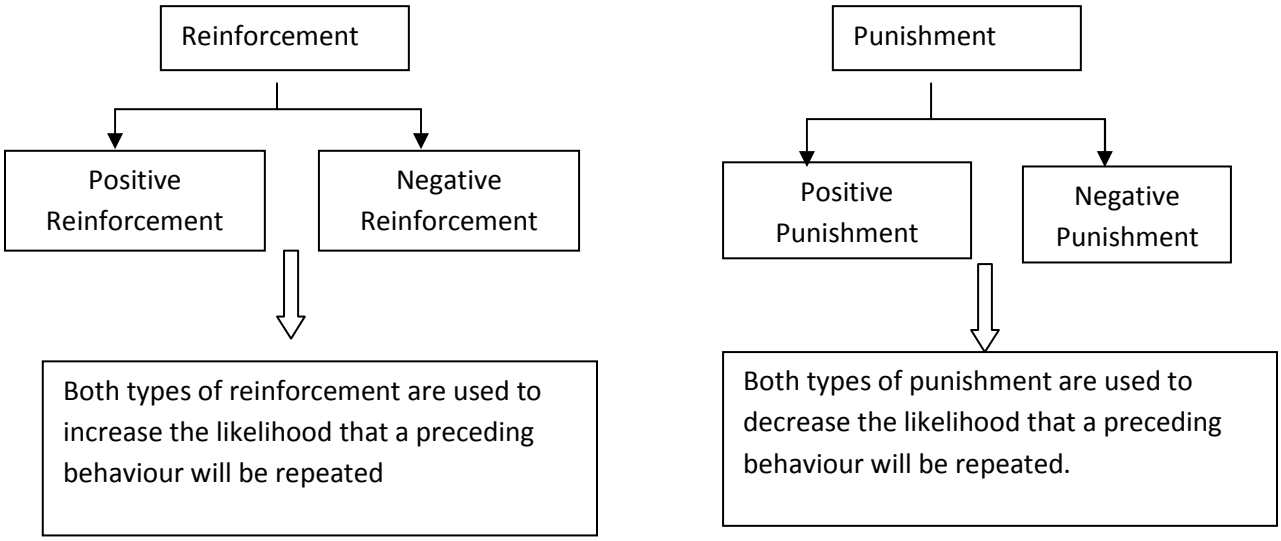
Operant conditioning is a form of learning in which the consequences of behavior lead to changes in the probability that the behavior will occur. Operant conditioning forms an association between a behavior and a consequence. Consequences have to be immediate or clearly linked to the behavior.

For example, you might tell your friends that you will buy dinner for them since they helped you move, or a parent might explain that the

child can't go to summer camp because of her bad grades. With very young children, who don't have verbal skills, and animals, you can't explain the connection between the consequences and the behaviour. For the animal, the consequence has to be immediate.

Types of Reinforcement and Punishment

Reinforcement is a consequence that increases the probability that a behavior will occur. On the other hand, punishment is a consequence that decreases the probability a behavior will occur. Put it another way, reinforcement will strengthen a behavior while s punishment will weaken a behavior. There are 2 forms of reinforcement and punishment as shown in the diagram below



Take note when something is added or represented, the process of learning is called positive and when something is removed or taken

away, the process of learning is called negative. The table helps us to understand these forms of reinforcement and punishment.

Form of consequence	**Description**	**Example**
Positive reinforcement	Receiving something pleasant will increase behavior occurrence.	A student is praised for asking question. Subsequently, the student asks more questions.
Negative reinforcement	Removing something unpleasant will increase behavior occurrence.	A son who is tired of hearing his father's nagging will does the home work. He does the home work to remove the nagging (santrock, 2008)
Positive punishment	Removing something un pleasant will decrease behavior occurrences.	If a teacher frowned when his student asked question, the student would be less likely to ask question again.
Negative punishment	Removing something pleasant will decrease behavior occurrences.	A misbehaving student is removed from the class.

Schedule of reinforcements

Reinforcements are more effective when they are given as soon as possible after a student performs the target behavior. In continuous reinforcement like this, a person learns very rapidly but when the reinforcement stops, the behavior decreases rapidly too. Therefore, the schedule of the reinforcement was developed. The schedule will determine when a behavior will be reinforced.

There are 4 types of schedule of reinforcement, they are;

1. Fixed –ratio schedule

2. Variable –ratio schedule fixed

3. Fixed –interval schedule, and

4. Variable –interval schedule.

OBSERVATIONAL LEARNING

Processes of observational Learning

There are 4 processes involved in observational .These include;

- Attention
- Retention
- Production
- Motivation

1. Attention; Before people can imitate model's behavior, they must pay attention to what the model is doing or saying. For example, seeing a teacher writing from the same perspective as the student see their own makes observational learning easier.

2. Retention; To produce a model's action, students must be able to store the model's action in the memory for future retrieval. Students' retention will be improved when a teacher gives vivid, logical, and clear demonstrations.

3. Production; To attending and remembering, students must be physically cable of reproducing the model's action. Here, the students need a lot of practice, feedback, and coaching before they can reproduce the model's action.

4. Motivation; The students must be motivated to demonstrate the model's action.

Reinforcement can be used to encourage observational learning. For example, a teacher may want to use direct reinforcement such as saying "Good work!" Alternatively, a teacher may want to use vicarious reinforcement. In this case, a student may simply see other students being reinforced for a particular behavior and then he increases his own production of that behavior.

Applying observational learning in counseling

Observational learning focuses on how people learn by observing and imitating others. To motivate learning using approach, a counselor may;

- `Use high-achieving and successful peers as models.
- Model positive behaviors him/ herself.
- Use vicarious reinforcement that is make sure clients see that positive behaviors will lead to positive consequences.
- Demonstrate and teach good behavior.

Application of observational learning in Real life situations

Observational learning can be and has been used successful for;

- Overcoming fears in children
- Assertiveness training
- Treating fear of medical treatment and surgery

- Leaning sports and athletics
- Learning new skills, like swimming
- Classroom situation: good performers and high achievers are rewarded so that they act as models for other children.

The following are also learned through observation of others performing the same act:

Learning gender roles

Adopting new fashions

Starting smoking

Drug abuse

Drinking alcohol

Violence and aggression learnt and displayed by the community.

Other ways of learning

a) Motor learning
b) Problem solving

a) Motor learning: - it involves the practice application of the learned phenomena. There are various tasks/ activities in which motor skills are of primary importance as compared to the ones requiring verbally learned material; e.g. learning the skills like playing football, tennis, cricket etc.; or the training of technicians whose

motor skills need to be highly efficient. In learning motor skills two things are important; quickness of movements and the results that are achieved through it.

b) Problem solving: - problem solving tasks usually involves trial and error and primarily includes verbal processes. While doing the problem – solving task; individual learns many responses that can be helpful for him in different situations.

ACTIVITY

1 (a) Describe the following theories of learning and adaptation.

(i) Operant conditioning
(ii) Classical conditioning

(b) Explain the following concepts.

(i) Unconditional stimulus
(ii) Unconditional response
(iii) Conditioned stimulus
(iv) Conditioned response

2. Using relevant examples, differentiate between positive and negative reinforcement.