

# Learning - Slide 9

*By: Nesrin Sultan*

- Defined as a relatively permanent change in behavior that is the result of practice.
- There are four basic kinds of learning:
  - a) Habituation, in which an organism learns to ignore a familiar and inconsequential stimulus.
  - b) Classical conditioning, in which an organism learns that one stimulus follows another.
  - c) Operant conditioning, in which an organism learns that a particular consequence
  - d) Complex learning, in which learning involves more than the formation of associations.

- Early researches on learning were done from a behaviorist perspective.
- It's often assumed that behavior is better understood in terms of external causes than internal ones, those simple associations are the building blocks of all learning, and that the laws of learning are the same for different species and different situations.
- These assumptions have been modified in light of subsequent work.
- The contemporary analysis of learning includes cognitive factors and biological constraints as well as behaviorist principles.
  
- In Pavlov's experiments, if a conditioned stimulus (CS) consistently precedes an unconditioned stimulus (UCS), the CS comes to serve as a signal for the UCS and will elicit a conditioned response (CR) that often resembles the unconditioned response (UCR).
- Stimuli that are similar to CS also elicit the CR to some extent, although such generalization can be curbed by discrimination training.
- These phenomena occur in organisms as flatworm and humans.
- Cognitive factors also play a role in conditioning.
- For classical conditioning to occur, the CS must be a reliable predictor of the UCS; that is, there must be a higher probability that the UCS will occur when the CS has been presented than when it has not.
  
- According to ethologists, what an animal learns is constrained by its genetically determined "behavioral blueprint".
- Evidences for such constraints on classical conditioning come from studies of test aversion.
- While rats readily learn to associate the feeling of being sick with taste of a solution, they can't learn to associate sickness with a light. Conversely birds can learn to associate light and sickness but not taste and sickness.

- Operant conditioning deals with situations in which the response operates on the environment rather than being elicited by an unconditioned stimulus, the earliest systematic studies were performed by Thorndike, who showed that animals engage in trial-and-error behavior and that any behavior that is followed by reinforcement is strengthened; this is known as the law of effect.
- In Skinner's experiments, typically a rat or pigeon learns to make a simple response, such as pressing a lever, to obtain reinforcement. The rate of response is a useful measure of response strength.
- Shaping is a training procedure that is used when the desired response is novel; it involves reinforcing only variations in response that deviate in the direction desired by the experimenter.
- A number of phenomena can increase the generality of operant conditioning.
- One is conditioned reinforcement, in which a stimulus associated with reinforcement acquires its own reinforcing properties.
- Other relevant phenomena are generalization and discrimination; organisms generalize responses to similar situations, although this generalization can be brought under the control of discriminative stimulus.
- Finally, their schedules of reinforcement: once a behavior is established, it can be maintained when it is reinforced only part of the time.
- Exactly when the reinforcement comes is determined by its schedule; the basic types of reinforcement schedules are fixed ratio, variable ratio, fixed interval, and variable interval schedules
- There are three different kinds of aversive conditioning:
  - In punishment, a response is followed by an aversive event, which results in the response being suppressed.
  - In escape, an organism learns to make a response in order to terminate an ongoing aversive event.
  - In avoidance, an organism learns to make a response in order to prevent the aversive event from even starting.
- Cognitive factors play a role in operant conditioning
- For operant conditioning to occur the organism must believe that reinforcement is at least partly under its control; that is, it must perceive a contingency between its responses and the reinforcement.
- Biological constraints also play a role in operant conditioning.
- There are constraints on what reinforcers can be associated with what responses: With pigeons, when the reinforcement is food, learning is faster if the response is pecking a key rather than flapping the wings; but when the reinforcement is termination of shock, learning is faster when the response is wing flapping rather than pecking.

- According to the cognitive perspective, the crux of learning is an organism's ability to represent aspect of the world mentally and then operate on these mental representations rather than on the world itself.
- In complex learning, the mental representation depicts more than associations, and the mental operations may constitute a strategy.
- Studies of complex learning in animals indicate that rats can develop a cognitive map of their environment as well as acquire abstract concepts such as cause.
- Other studies demonstrate that chimpanzees can solve problems through insight and then generalize the solutions to similar problems.
- When learning relationships between stimuli that are not perfectly predictive, people often invoke prior beliefs.
- This can lead to the detection of relationships that are not objectively present; having a prior belief about it can lead to objective relationships conflicts with a prior belief, these effects demonstrate top-down processing in learning.

## Behavior Modification

- Can be done by behavior therapy which is based on the principles of learning and conditioning.
- Behaviorists assume that maladaptive behaviors are learned ways of coping with stress, and that the techniques used in experimental research on learning can be used to substitute more appropriate responses for maladaptive ones.
- Behavior therapists point out that while the achievement of understanding is a worthwhile goal it does not ensure behavioral change.
- Often we understand why we behave the way we do in certain situation but are unable to change our behavior.
- The aim is to modify the maladaptive behavior, the first step is to define the problem clearly.
- When the behaviors that need to be changed have been specified the therapist and the client workout a treatment program choosing the most appropriate treatment for this problem.
- ❖ Methods used :
  - Systemic desensitization
  - In vivo exposure (flooding )
  - Selective reinforcement
  - Modeling
  - Behavioral rehearsal
  - Self-regulation

## **Past Paper Question**

All the following statements are true of conditioning, except:

- a. classical conditioning is a respondent conditioning
- b. instinctual behavior is a learned behavior\*
- c. discrimination occurs on the basis of selective reinforcement and extinction
- d. emotional responses are learned
- e. negative reinforcement is a means to increase desired response