East African Journal of Education and Social Sciences
EAJESS May-June 2022, Vol. 3, No. 3, pp. 107-113
ISSN: 2714-2132 (Online), 2714-2183 (Print). Published by G-Card
DOI: 1 https://dx.doi.org/10.4314/eajess.v3i3.184

The Use of Conditioning in Behavior Modification

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Abstract*:* Behavior modification has been an important topic of discussion in psychology for decades. This topic has generated much interest among parents, educators, marketers, clinicians and others. We all want to understand how to effectively help people to change undesirable behaviors. Behaviorists have developed a number of theories and have contributed significant insights into how the principles of these theories can be applied to modify behaviors. This paper reviewed three such theories: classical conditioning, operant conditioning, and contiguous conditioning. The articles reviewed suggested that the principles of these theories, when implemented, help to modify behaviors. However, not all can be depended on for lasting effects. Classical and operant conditioning remain effective only with reinforcements. When the reinforcements are removed, the response (behavior) goes extinct. Contiguous conditioning, on the other hand, proposes three approaches to behavior modification which seem to have a longer lasting effect on behavior modification.

Keywords: Classical Conditioning; Operant Conditioning; Contiguous Conditioning; Behavior; Modification

How to cite:
Thompson-Bramwell, B. and Mauzard, N. (2022). The Use of Conditioning in Behavior Modification. East African Journal of Education and Social Sciences 3(3), 107-113. Doi: https://dx.doi.org/10.4314/eajess.v3i3.184.

Introduction

Behavior modification has been an important and widely discussed topic in psychology for decades. This topic has sparked the interest of parents, teachers, school administrators, business marketing managers, and clinicians. How can we effectively help people to change undesirable behavior or learn new behaviors? Psychologists have developed a number of conditioning theories and have given important insights into how the principles of these theories can be applied to modify behaviors. However, in most literature surveyed, only classical and operant types of conditioning are discussed. While classical and operant conditioning theories are important and are widely discussed, the authors of this article present the third conditioning theory known as contiguous conditioning. Weibell (2011) noted that Guthrie's theory (contiguous conditioning) is not a popular influence in the current design of instruction and is rarely discussed in learning psychology textbooks at the college level. However, the conditioning is considered useful in behavior modification.

Therefore, this article sought to examine all three conditioning theories – classical conditioning, operant conditioning, and contiguous conditioning. The information presented will help readers to determine which of the three theories to use in any situation where behavior modification is required. A summary of each theory is outlined, followed by a discussion on the

use and of each theory in behavior modification, and finally, a conclusion as to whether these theories can be used to effectively modify human behavior.

Classical Conditioning

The theory of classical conditioning is attributed to Ivan Pavlov. Based on this theory, each environmental event corresponds to some point on the cortex. As these events are experienced, they tend to excite or inhibit cortical activity. Consequently, the cortex is constantly being excited or inhibited depending on the experience of the organism. Pavlov called this process cortical mosaic and he believed that this determines how the organism responds to the environment. As the environment changes, the cortical mosaic changes and so does the behavior (Olson and Hergenhahn, 2016).

According to Bottaro (2022), classical conditioning is an unconscious learning method that is often used as a technique to modify undesirable behaviors. Elmer (2020) stated that learning through classical conditioning occurs when an automatic conditioned response is paired with a specific stimulus to create a behavior. Pavlov conducted research on the digestion of dogs when he noticed that the dogs' physical reactions to food subtly changed over time. Initially, the dogs would only salivate when the food was placed in front of them. However, they later salivated slightly before their food arrived. Pavlov realized that they were salivating at the noises that were consistently present before the food arrived. For example, the sound of an approaching food cart. To test his theory, Pavlov set up an experiment in which he rang a bell shortly before presenting food to the dogs. At first, the dogs did not respond to the bells. However, eventually, the dogs began to salivate at the sound of the bell which was associated with food. The dogs were conditioned.

The Use of Classical Conditioning

According to Rehman, Mahabadi, Sanvictores and Rehman (2021), classical conditioning is a form of learning. They went on to state that the principles of Pavlov's theory can be used to influence human health, emotion, motivation and therapy of psychological disorders. They finally argue that the clinical related uses of classical conditioning include the following:

1. To help drug users overcome their addiction. It has been observed that when former drug users find themselves in drug related environments or in the presence of people they associate with drug use, they experience a craving for the drugs. Therefore, counselors usually advise these people to stay away from those environments as the environments could prompt a desire to take drugs again.
2. To help in overcoming phobias. The authors cited a patient who had a fear for the elevator. After forcing herself to enter the elevators several times a day for ten days, her fear almost completely disappeared.
3. The authors further cited the work of Mowrer (1938) as cited in Rehman et al. (2021) who used classical conditioning to successfully develop a therapy for a frequent bed-wetter. In this therapy, the individual was allowed to sleep on a liquid-sensitive pad that was connected to an alarm. As soon as moisture was detected, the alarm would go off. After repetition, bladder relaxation became associated with waking up and 75% of the time, the frequent bed-wetting was rectified.

In addition to the techniques listed above, aversive conditioning may also be used to effect changes in behavior. Rehman et al (2021) cited an example of the mixing of alcohol with an extremely bitter taste. This bitter taste in the alcohol causes the individual to associate unpleasantness with the consumption of alcohol. This will then eliminate the individual's desire for alcohol. However, this technique may not be as effective because the individual is able to differentiate between situations inside and outside of the psychiatrist's office. An alcoholic understands that alcohol does not normally have that bitter taste so if he drinks it outside of a particular environment the result will be different.

On the other hand, classical conditioning can be used in a negative way for exploitation of others. For example, the use of classical conditioning in advertisements can impact the consumer in a negative way although it benefits the advertiser. The advertiser's goal is to get consumers to associate their product with a particular response or feeling that will make them more likely to buy the product. These types of associations often

lead to undesirable behaviors such as impulse buying and poor food choices.

According to Cherry (2022), classical conditioning can be applied in the classroom. One way of applying this is by creating a classroom environment that is positive to help students overcome anxiety or fear. The author further stated that pairing an anxiety-provoking situation, such as performing in front of a group, with pleasant surroundings helps the student learn new associations. Instead of feeling anxious and tense in these situations, the student will learn to stay relaxed and calm.

Millacci (2021) also cited several examples of classical conditioning being used positively in the classroom. For example, if the teacher turns on the light whenever she wants the students' attention, the turning of the lights will be associated with quietness and attention. She further stated that classical conditioning can also prevent learning. For example, if the teacher punishes students when they fail to solve a Mathematics problem, the student will associate Mathematics with punishment and therefore develop a hate for Mathematics.

Operant conditioning

The theory of operant conditioning is attributed to B.F. Skinner because he was the first to describe it. This explains why it is sometimes referred to as Skinnerian conditioning. Skinner rejects the notion that understanding of internal thoughts and motivations are prerequisites for explaining behaviors. He believed that we only need to understand the external, observable causes of human behavior. As stated by Olson and Hergenhahn (2016), operant conditioning emphasizes the consequences of behavior, in that, behaviors will elicit either reward or punishment.

Skinner's theory explained how we develop the range of learned behaviors we display daily. The theory of operant conditioning was significantly influenced by the work of Edward Thorndike, who suggested the law of effect. Based on this law, actions that are followed by desirable outcomes (rewards) are more likely to be repeated while those followed by undesirable outcomes (punishment) are less likely to be repeated.

Skinner developed the theory of operant conditioning by conducting experiments using animals which he placed in a 'Skinner Box' also referred to as an operant conditioning chamber. A skinner box was a device that is used to objectively record an animal's behavior in a restricted time period.

The animal was rewarded or punished for participating in certain behaviors, for example, the pressing of a lever by the rats. Skinner demonstrated how positive reinforcement worked by placing a hungry rat in his Skinner box. The box had a lever on the side, and as the rat moved around the box, it would inadvertently hit the lever. When the lever was hit, food instantly fell into a container beside the lever.
After being put in the box a few times, the rats quickly learned to go directly to the lever. The result of receiving food when they pressed the lever guaranteed that they would repeat the action several times. To demonstrate how negative reinforcement worked, Skinner placed a rat in his Skinner box and then subjected it to electric shock which caused discomfort. As the rat moved around the box, it accidentally hit the lever. As soon as the lever was hit, the electric current was turned off. After being put in the box a few times, the rats learned to go directly to the lever. Escaping the electric shock ensured that they would repeat the action several times (Mcleod, 2018).

Cherry (2020) posited that operant conditioning is based on a very simple principle: Behaviors that are followed by reinforcement will be strengthened and become more likely to be repeated in the future. For example, if a child is rewarded for completing assignments on time, he is more likely to keep turning in assignments on time. Similarly, if a child empties the garbage pan after lunch and teacher praises him, he is more likely to carry out the garbage pan the next time it is full. Why? Because the behavior was followed by reinforcement or a desirable outcome, the preceding action is strengthened. On the other hand, behaviors that are followed by punishment or undesirable consequences will be weakened and less likely to occur again in the future. If the child turns in his assignments late and is punished, he is less likely to be late again. If the child empties the garbage pan and the other students laugh at him, he is less likely to empty the pan again. Reinforcement and punishment are in natural settings all the time, as well as in more

structured settings such as classrooms or therapy sessions.

The Use of Operant Conditioning in Behavior Modification

Operant conditioning is frequently used in the classroom. According to Olson and Hergenhahn (2016), Skinner emphasized the use of extrinsic reinforces in the classroom. The idea is to use reinforcement to encourage desirable behaviors. Using operant conditioning can give students immediate feedback about their behavior. When the teacher rewards positive behavior, other students are more likely to copy that behavior to earn the reward. Also, the rewarded student is more likely to repeat that behavior because of the positive feedback. Immediate feedback is useful in curtailing negative classroom behaviors as well. Simple punishment or withholding of praise can function as operant conditioning in education. When the teacher punishes negative behavior, other students will want to avoid that punishment, and so they are less likely to perform that behavior. Likewise, the punished student will be less likely to repeat the behavior.

Renner (2018) noted that using operant conditioning in the classroom can be part of a sound classroom management strategy. However, relying too heavily on operant conditioning alone has its drawbacks. Operant conditioning in education relies on extrinsic motivation, or factors outside the students themselves. She further stated that one advantage for extrinsic motivation is that it is less permanent than intrinsic motivation. Intrinsic motivation exists without the presence of external motivating factors. If extrinsic motivations are relied on too heavily, when those motivating factors are removed, the behaviors they shaped are more likely to decrease or disappear. A more valuable approach is to use a combination of effective classroom management techniques and intrinsic and extrinsic motivating factors together.

Contiguous Conditioning

Based on Weibell (2011), the theory of contiguous conditioning is based on the law of contiguity developed by Edwin Guthrie. The law of contiguity states that "a combination of stimuli which has accompanied a movement will on its recurrence tend to be followed by that movement." According to this principle, a stimulus that causes a response will cause the same response if the stimulus is experienced again. That is to say, if you respond in a particular way in a given situation, the next time you encounter similar situation, you will respond in a similar way.

According to Guthrie (1935) cited in Olson and Hergenhahn (2016), all learning is based on a stimulus-response association and learning occurs normally in one associative episode. He explained that the reason why extended practice and several repetitions are required to establish certain skills is that these require many specific movements to be attached to many different stimulus situations. Guthrie believed that a skill is not simple habit but a large collection of habits that achieve certain result in many and varied situations. Guthrie further stated that each movement produces stimuli and the stimuli then become conditioned. Every motion serves as a stimulus to many sense organs in muscles, tendons and joints. Stimuli which are acting at the time of a response become conditioners of that response. Movement-produced stimuli become conditioners of the succession of movements. The movements form a series often referred to as a habit. Our movements are often classified as forms of conditioning or association. Some behaviors involve the repetition of movements, so that conditioning can occur long after the original stimulus.

Guthrie rejected the law of frequency and supported one-trial learning. One-trial learning states that a stimulus pattern gains its full associative strength on the occasion of its first pairing with a response. He did not agree that learning is dependent on reinforcement. He defined reinforcement as anything that alters the stimulus situation for the learner. He rejected reinforcement because it occurs after the association between the stimulus and the response has occurred. According to Guthrie, learning is the process of establishing new stimuli as cues for some specified responses.

Guthrie's law of contiguity and one-trial learning made the regency principle necessary. In Guthrie's theory, the regency principle plays an integral role in the learning process. This principle states that the act which was done last in the presence of a set of stimuli will be the same which is done when the stimulus combination occurs again. For Guthrie, it is the time relation between the substitute stimulus and the response that is

important. When two associations are present with the same cue, the more recent will prevail. The stimulus-response connections tend to grow weaker as time elapsed.

Based on the contiguity theory, forgetting is a form of retroactive or associative inhibition. Associative inhibition occurs when one habit prevents another due to some stronger stimuli. Guthrie claimed that forgetting is due to interference because the stimuli become associated with new responses. Sidetracking, he believed, can be used to change previous conditioning. This involves discovering the initial cues for the habit and associating other behaviors with those cues. Separation of internal associations is caused by sidetracking. It is easier to sidetrack than to break a habit (Sivakumar and Thirumoothy, 2018).

According to Olson and Hergenhahn (2016), rewards and punishment are not important in the contiguity theory because they occur after the association between stimulus and response. Guthrie thought that punishment was only as effective as the amount of change in behavior the punishment caused. They went on to state that based on Guthrie's theory, if punishment is to be effective, it has to be given in the presence of the stimuli that elicit the undesirable behavior. When punishment is ineffective, the negative behavior may even be strengthened.

Use of Contiguous Conditioning

One significant aspect of Guthrie's contribution to behaviorism was in the breaking of habits which is basically behavior change. Several authors have discussed the use Guthrie's approach to behavior modification. Habits are learned behaviors in response to various cues. Guthrie (1938) (as cited in Olson and Hergenhahn, 2016) studied both habit formation and habit breaking. He suggested three approaches to breaking habits: threshold, fatigue and incompatible response.

Threshold Approach

In this approach, a weak stimulus is introduced and gradually increased in strength right to the point of the person's tolerance. For example, a child will not sit still to complete assigned tasks in class. The teacher might gradually increase the amount of time the child has to sit still and complete tasks from five minutes to eventually 30 minutes. By moving incrementally, the student slowly breaks the bad habit of restlessness and replaces it with the habit of attentiveness.

Fatigue Approach

In this approach, the individual is forced to repeat an unwanted response in the presence of a stimulus. For example, if a child will not sit still, the teacher would make them run around the class nonstop until he is exhausted. Even though the child loves to play, the possibility of fatigue from over exposure changes his behavior.

Incompatible Response

This approach involves the presence of a stimulus but having the person make a response that is incompatible with the unwanted response. For example, if a child will not stop talking, the teacher might have the child write a story. Since it is difficult to write and talk at the same time, it helps to encourage the desired behavior of silence. The response of writing and talking are incompatible with each other. This friction leads to the silence that the teacher desires.

Guthrie's theory can be effectively applied in the classroom to enhance behavior management. Improvement comes about because irrelevant movements are unlearned or not included in succeeding associations. In applying this theory to the classroom, the following principles must be observed.

1. In order for conditioning to occur, the organism must actively respond. Therefore, students must be actively involved in the learning process.
2. Since learning involves the conditioning of specific movements, instruction must present very specific tasks. The teacher must be organized and clear in the instructions presented.
3. Exposure to many variations in stimulus patterns is desirable in order to produce a generalized response.
4. The last response in a learning situation should be correct since it is the one that will be associated. (Guthrie, 1938, 1942 cited in Olson and Hergenhahn, 2016; Weibell 2011; Malone, 2016).

According to Encyclodedia.com (2019), Guthrie believes that "we learn only what we ourselves do." This has significant implications for how we

teach. It therefore means that students must always get opportunities to practice skills taught. For example, if in the foods lab the student watches the teacher skillfully demonstrates how to decorate cakes but never gets the opportunity to decorate one, the student will become a very good observer of the teacher decorating cakes but she will not become better in decorating cakes herself, unless she herself does something other than watching. The responses we wish to cue to various stimuli must be made by the individual himself in the presence of those stimuli. Based on Guthrie's theory, teaching methods such as drill have very little value. Making the same response over and over again will not further learning unless the circumstances are changed and only to the extent that the circumstances are changed. This theory argues well for the student-centered classroom where students are actively involved in their learning and the teacher serves as a guide or facilitator (Olson & Hergenhahn, 2016).

Conclusions and Recommendations

When it comes to behavior modification, classical and operant conditioning seem to be the most prominent theories. Their effective use by marketers, educators and clinicians has been well documented. It must be noted, however, that both classical and operant conditioning depend on reinforcements which are extrinsic motivations. The disadvantage of extrinsic motivation is that the behavior change that they cause is not as permanent as those brought about by intrinsic motivation (Renner, 2018). Nevertheless, classical and operant conditioning theories are not the only means of changing behaviors. Contiguous conditioning is also an effective means of behavior modification. As suggested by Malone (2016), when it comes to behavior modification, Guthrie's principle (contiguous conditioning) is unbeatable.

Contiguous conditioning does not rely on reinforcers for behavior modification. This theory discourages the use of punishment while encouraging the replacement of bad habits with good ones. The three methods, threshold, fatigue, and incompatible response that this theory suggested for behavior modification can be applied in the classroom. They can be helpful to teachers who are struggling with classroom management issues. The incompatible response approach is especially effective since it replaces the bad behavior with a desirable one. Even though contiguous conditioning seems not to be as popular as classical and operant conditioning, it can be very effective in behavior modification.

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