Case Report

The Role of Reward and Punishment in Learning

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ABSTRACT
Since their creation, human beings have learned and been taught. Learning has always been accompanied by various techniques and mechanisms used by teachers. The two most important techniques are rewards and punishment, which are critical aspects of human life especially in education. This paper aims to investigate the impact of reward and punishment in education and consequently learning. Furthermore, a number of topics in the field of learning are discussed including types of learning, the meaning and definitions of reward and punishment, types of reward and punishment, different extremes in using the techniques, the reason for discouraging punishment. Moreover, field studies on the topic in Iran and other countries in different time periods are reviewed. Finally, various results as well as theories pertaining to reward and punishment are summarized.

Keywords: Learning, reward, punishment, desirable behavior, undesirable behavior.

1. INTRODUCTION
Overall, learning refers to understanding any content, technique, or behavior by an organism. Learning has most frequently been studied in the context of human beings (and sometimes animals) both in the past and in the present. Humans achieve excellence through learning and without it they retain their animalistic nature. From the beginning until now, humans have learned to survive according to different conditions whether on purpose or accidentally. This is because humans continue to learn for all issues in their lives. Learning requires both intrinsic and extrinsic factors including a teacher to learn from. Learning is the result of being educated by others such as parents, a knowledgeable person, an animal, or a natural or artificial design.

Innon-accidental learning, the individual needs some education to learn the things he cannot learn on his/her own. Thus, help from another person is necessary who is known as the teacher and is responsible for education. This person should teach predetermined content and in doing so leverages a number of techniques. Importantly, these techniques include reward and punishment. In our world, everything, even the smallest particle (or behavior), must be in its appropriate place so that decent results are obtained.
Therefore, reward and punishment must be used appropriately to have the best outcome. It should be noted that any positive factor can have adverse consequences if it is overused or underused. This will result in undesirable outcomes. In this paper, we aim to focus on the application of reward and punishment. These techniques have always been tied with learning. The correct application of these two critical behaviors is very important in achieving the best possible results. Thus, in this paper, we review these techniques and consider their applications, advantages and disadvantages.

2. LEARNING
Learning is the most significant thing that separates humans and other beings. Newborns learn to interact with their surroundings from the first moments of their lives. They learn that, in case of hunger, crying makes their mothers pay attention to them. In animals, however, learning is based on instincts. Actions such as building nests and procreation are all performed instinctively. Learning is a continuous process with distinct variations for each individual. It involves one's entire personality including physical and mental characteristics as well as goals, desires, and how they relate to each other. The individual differences in these areas cause differences in the learning process (BadrTalei, 2000). Thus, each person has distinct learning attributes.

**Literal meaning of learning**
Literally, learning has been defined as the ability to memorize or acquire new knowledge (Dehkhoda)

**Meaning of learning**
Various definitions exist for learning which have several differences, indicating lack of consensus between scholars. Woodworth defines learning as “a type of activity performed by the learner that impacts subsequent activities. It is characterized by the fact that it leads to improved activities in the future”. Glister argues that “learning is the adjustment of behavior performed by the learner through practice and error” Gilnord also states that “learning is a type of adjusting or changing behavior which may be caused by a stimulus” (AkhavanAlizadeh, 1994).
Learning is a relatively durable change in feelings, thoughts, and behaviors which is brought on by experience. Behaviorists such as Watson and Skinner believed that humans are flexible in nature and that learning has the central role in growth. Regardless of a child’s talents, desires, interests, abilities, legacy, and race, education has the ability to transform the child into any adult.

The psychologist Hans suggested that the things which appear to be instinctively programmed may be impacted by environmental events. McGraw, Dins, Ghezl, and Tamson believed that learning and experience were inconsequential to developmental differences. However, recent studies suggest that practice or simulation are more capable of accelerating behavioral change. Not all types of learning will result in function since individuals learn a significant amount of things but never have the opportunity to apply their learnings (Wikipedia, 2016).

The most comprehensive definition of learning is proposed by Higar and Markowitz(1968) who define it as a relatively durable change in potential behavior conditioned on the fact that the change occurs based on experience. It should be noted that the word potential refers to learning in the person which may lead to change in behavior. This is because true learning does not occur unless the person is able to apply the things he/she has learned.

**Types of Learning**
Given the definitions of learning, i.e. relatively durable changes in behavior caused by experience, it is possible to distinguish between many types of learning because individuals gain a myriad of experiences from birth to death. Different attempts of walking, talking, eating, communicating, driving, and acquiring skills have led scholars to identify many types of learning. In the following, we briefly discuss some of these.
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Verbal Learning
A type of learning which is achieved when the content is expressed as words and sentences. When a student tries to learn a new language he/she is in fact taking advantage of verbal learning. Furthermore, a student trying to learn a new topic such as biology which contains new terminology is in fact using this type of learning.

Motor Learning
This type of learning is achieved when the learner is taught something that includes kinetic content. In other words, when the learner tries to acquire new moves he/she is using motor learning. Skills such as swimming, bicycling, and throwing are of this type. It includes simple or complex skills such as throwing a ball or swimming or even playing an instrument which requires intricate movements. In this type of learning, practice is of utmost importance.

Observational Learning
It refers to a type of learning through which a live entity learns to imitate another being. Thus, it is also known as social learning. As an example, consider a child who watches his/her mother doing housework and replicates the behaviors.

Avoidance Learning
This type of learning occurs when a live being uses a symbol or sign to avoid a stimulus. In other words, the entity tries to avoid a harmful situation. Image a child who is hurt by touching a hot heater and tries to avoid touching the heater from that point on. This is an instance of avoidance learning.

Accidental Learning
It is a type of learning that occurs without intention or purpose such that a particular objective is not found in learning. For instance, sometimes by listening to music, one can learn something new without any intention to learn.

Latent Learning
In this type of learning, the learned content remains hidden. In other words, at the time of learning, the content remains latent until it is revealed in the necessary situation. Learning how teachers behave is of this type since the learned skills remain latent until the learner becomes a teacher. Then the new teacher exhibits the behaviors that he/she has learned (The National Network of Schools, 2015).

Learning Factors
1. Development and preparedness
2. Previous experiences and prerequisites
3. Motivation
4. Attention

Development and preparedness
In order for a child to achieve learning success, mental, physical, psychological, and emotional development are necessary. In order to become successful in writing, arithmetic, and reading and gain sufficient attention span, children need to have good mental, social, emotional, and psychological growth. Therefore, while creating educational programs these areas of development need to be taken into consideration. If teachers believe that their students have no physical, intellectual, emotional or verbal problems, they should understand that their emotional, motivational, mental, and social status in the classroom may be extremely critical.

Previous experiences and prerequisites
Each person’s experiences shape the basis for the things they subsequently learn. People always rely on their previous experiences to make decisions and understand their surroundings. Thus, it is essential to have the learners’ previous experiences in mind so that education programs achieve the highest possible success. This because by taking previous experiences into consideration, learners become prepared for new information given by the teacher.

Motivation
Motivation is among the most important factors of learning. It is the desire and interest one demonstrates to attain a goal. The individual’s effort is proportional to his/her motivation. In order to instill this motivation in adolescents, appropriate measures must be taken to increase their interest in the topic to be learned, which requires creating appropriate feedback.
Attention
Attention refers to focusing one’s mind and senses on a particular topic. Without attention, learning is not possible. It is the prerequisite to understanding, learning, and thought. Attention is a selective issue: people are always faced with many stimuli which require their attention. Therefore, choice is inevitable in this matter (Afrouz, 2002).

Reward and Punishment
Reward and punishment are two learning techniques that are always used in many environments including education, work, and life. Most learning activities in our lives are impacted by these techniques. They have many variations which need to be applied by considering time, place, personality, facilities, and several other variables to yield the best results.

Sulser, Azarof and Mayer believe that reinforcement can happen both naturally, as a result of everyday interactions with a social environment, and as part of a behavior modification program designed to change human behavior (Mitonberg, 2013).

Literal Meaning of Reward
In a literal sense, reward means to make someone excited, willing, and wishful (Dehkhoda, 1994).

Definition of Reward
When a behavior leads to desirable outcomes, it is more likely to occur in future situations. Therefore, reinforcement is merely the impact seen by the reinforcing agent. To determine whether an event is capable of reinforcing, its impact should be considered.

Types of reinforcement
Skinner identifies two types of reinforcement: positive and negative (Mitonberg, 2013).

Positive Reinforcement
According to Skinner, positive reinforcement occurs when the consequences of a behavior are immediately observed and the chance of repeating the behavior increases (Loferansoa, 2014). In fact, in order to reinforce a child’s behavior and increase the odds of repeating that behavior, one should create a reward so that the behavior becomes associated with a desirable outcome (Koromboltez and Koromboitez).

Negative reinforcement
Negative reinforcement is a process whereby a behavior eliminates the negative punishment and thus the likelihood of the behavior increases. Furthermore, negative reinforcement involves a stimulus whose elimination results in enhancing the behavior which causes the elimination. For example, in order to prevent a child from exhibiting a negative behavior one should stop the bad consequences that are associated with the behavior once the behavior stops (Seyf, 2011).

Principles of Reward
Tom Peters argues that by following the right method of rewarding, one can obtain excellent results. The theorist Edward Lovler believes that reward must be dependent on performance (Cohen, 2013). In reinforcement, five principle need to be considered as follows:

Principle One: Choosing the right reinforcing agents
Different agents have different results for various individuals. Even the same agent yields differing results on the same person under various conditions. This should be carefully considered in any situation and with any individual.

Principle Two: Reward immediately after the behavior to have the best result
The biggest mistake any parent can make is to delay the reward for an appropriate behavior. A reward will be most effective if it immediately follows the behavior so that the desirable behavior is validated (Patterson, 1983). Reynolds states that during the delay between the behavior and the reward, the subject may exhibit other behaviors. Thus, the targeted behavior may remain underdeveloped since the unwanted behavior is also reinforced (Seyf, 2011).

Principle Three: Extent of reinforcement
The decision on the extent of reinforcement can be made based on a number of parameters. The extent to which the subject is deprived of the reward is an important factor. For instance, consider a teacher who always encourages
students with or without reason for all their behaviors. The reward offered by this teacher becomes much less effective (Sulzer et al., 1977).

**Principle Four: Novelty of situation and reinforcing agent**

Studies indicate that people prefer being involved in novel situations rather than doing repetitive tasks. Milson (1967) states that under similar conditions, most subjects prefer being in new situations.

**Principle 5: Constructiveness**

A child must be rewarded in a way that is constructive and precludes pride, self-appreciation and self-centeredness. Reward must make the child a better person and guide that person toward goals. It must also lead to increased effort and overall create a better human being.

The toys given to a child must enable him/her to think and become actively involved in innovation. For instance, instead of a winding car, the child should be able to play with building blocks (Tebyan, 2016).

**Over-rewarding**

If a person is over-rewarded, he/she will come to expect the reward and give less value to it. For example, if a child is rewarded every time he/she helps at home, the reward becomes less and less effective and may lead to harmful outcomes. If children become used to being praised or rewarded by their parents, they lose their interest and creativity which leads them to mimicking their parents without thought.

**Under-rewarding**

Sometimes, being under-rewarded may be just as harmful as being over-rewarded. Lack of reward may be perceived as punishment by children and adolescents. If a child is never encouraged or rewarded by his/her parents, he/she may come to feel worthless and may experience depression (Pirasteh, 2003).

**Punishment**

Reward and punishment have always been associated with each other in education. The latter used to have a greater role. However, advances in science and the study of behavior have led to the role of punishment being reduced. Nevertheless, some still believe that the technique is useful despite its damaging nature and must be used in certain conditions.

**Literal meaning of punishment**

Literally, the term punishment is defined as waking up or warning someone. In another sense, it means to penalize or discipline a person (Dehkhoda, 1994).

**Meaning of Punishment**

It refers to a process whereby an unwanted behavior is followed by negative reinforcement to prevent the behavior from reoccurring.

**Punishment vs. negative reinforcement**

Both punishment and negative reinforcement employ a negative reinforcing agent or annoying stimulus. However, the former aims to reduce the likelihood of the behavior by introducing the agent immediately after the behavior while the latter eliminates the agent following desired behavior and aims to increase the likelihood of exhibiting the correct behavior (Seyf, 2011).

**Types of punishment**

As in rewards, two types of punishment can be considered: positive and negative.

**Positive punishment**

If the introduction of the annoying stimulus leads to the reduction of the undesirable behavior, a positive punishment takes place. As an example consider a child who tears his sister’s shoes and is punished by being slapped. Thus, the child is less likely to repeat this behavior.

**Negative punishment**

In the case of negative punishment, eliminating the reinforcing agent decreases the likelihood of the negative behavior. For instance, an object is taken away from a child (elimination) because he/she throws it at others. By doing so, the chances of the bad behavior decrease (Loferansoa, 2014).

**When to use punishment**

Punishment is an integral part of our lives. However, intentional punishment should be used with caution and preferably avoided. Some
situations where punishment is inevitable are as follows:
1. To teach some skills including how to say “no”.
2. To prevent someone from experiencing critical danger.
3. To force someone to stop an undesirable behavior (Koromboltes, 2012).

**Conditions of punishment**
Too much punishment can deteriorate the parent-child or student-teacher relationship to such an extent that the elder party is disrespected and trust is lost. The individuals consider each other enemies and try to avoid contact with each other. Sometimes, unnecessary punishments may lead to resistance. For example, consider a student who is constantly and unfairly punished by his/her teacher(s) loses interest in learning and education. There are several conditions that must be met to justify punishment:
1. Punishment must be appropriate to the fault and immediately follow it so that the student understands his fault.
2. Before punishment, the reason for the undesirable behavior should be identified and appropriate guidance must be given. If all else fails, punishment must be resorted to as a last measure.
3. The teacher must make certain that the effect and result of the punishment must justify its application.
4. The teacher must be permitted by the parts to punish the student.
5. The age of the learner must be considered while applying the punishment.
6. Punishment must occur in the presence of authorities and certain delegated individuals (BadrTalei, 2000).
7. The negative reinforcement agent must be identified carefully.
8. Prior to punishment, necessary information regarding possible interventions must be gathered (Milton, 2014).

**Over-punishment and under-punishment**
Slight punishment has a small preventative effect and may sometimes prove ineffective. However, moderate punishment are able to prevent the undesirable behavior. Severe punishments, on the other hand, may have long-term unwanted effects. Thus, they must be avoided at all costs.

**Over-punishment**
It should be noted that all educational practices including reward and punishment must not be overused. Parents are often ignorant to how and when to use punishment. In addition to punishment, indulgence in other activities such as advisement and blame can prove harmful and lead to stubbornness and hatred. Stubbornness leads children to indifference and thus educational practices will no longer be effective. Many educational “dead ends” in families are caused by this problem. For example, a father who beats and belittles his son will eventually be unable to educate him.

**Under-punishment**
Many argue that punishment must not be used in education. However, bearing in mind the explanations in this article, it is difficult to image education without punishment. Some psychologists think that moderate punishment is necessary for forming the child’s personality during childhood.

**Why no punishment?**
Reinforcement causes the reinforced behavior to become stronger. However, the punished behavior always remains dormant and as long as the punishing agent exists, it does not manifest. Once the agent is removed, the behavior re-emerges. Another adverse outcome of punishment is the associated hatred of the person being punished from the punisher. In this way, the undesirable feeling of punishment becomes a conditioned response and the person being punished begins to loathe the punisher. Furthermore, punishment is contagious. According to Bandura and Walters, those watching others being punished have attempted to punish another person in another situation. In
another statement, Bandura says that students who have observed others being punished have come to mimic the behavior and tried to punish others. A third negative aspect is aggressiveness. Skinner argues that human beings are inherently kind to those that praise them while being aggressive towards those who punish them. Moreover, in order to avoid punishment, the punished party may stop the intended behavior only to replace it with another bad behavior (Seyf, 2011).

- A teacher who overuses annoying stimuli, is not capable of introducing positive reinforcement.
- Relying on annoying behaviors is dangerous in that the child develops negative feelings (I don’t have the ability or competence to do this task).
- Since punishment and behavior are associated, annoying stimuli may sometimes act as positive reinforcement agents (Mazhort, 1992).

By physical punishment, the child becomes constantly overstressed since he or she is always worried about doing the wrong thing and being punished in front of others. This stress deters progress and prepares the child for mental dysfunctions. A child who constantly receives physical punishment because of poor performance will gradually lose his confidence and begin to feel incompetent and fearful of doing big things. A child or adolescent who is always physically punished feels despised and loses his self-esteem overtime. Thus, he or she will begin to feel worthless and will be more willing to participate in criminal activities. Muslims believe that we must protect ourselves from those who consider themselves unworthy.

Physical punishment teaches the child that hitting others is the way to obtain what he desires. This will make him punish those who are weaker. A reason of lying among children is fear of being punished. In order to avoid being struck, children often resort to lying; over time, the behavior begins to stabilize and the child becomes accustomed to lying (Zolal Web Site, 2016).

Studies on Reward and Punishment

Studies on reward and punishment in Iran and other countries indicate that the former is much more effective than the latter. According to several Iranian studies, positive reinforcement methods yield better results. Rewards can be used as agents of motivation, efficiency, effort, and learning (Tohidi, 1991; Haj Ali Mohammadi, 1994).

On the other hand, studies on punishment reveal that the society not only respects punishment but also considers it necessary in certain situations. Punishment is still being used in various form in Iranian schools. Some investigations even report the use of physical punishment. According to the statistics only 61 percent of boys and 63 percent of girls have never been physically punished (middle school children in the Province of Khorasan; Rezadeh et al., 1992).

Physical punishment and aggressiveness have been shown to be positively related among boys. Furthermore, a positive relationship is observed between depression and physical punishment among girls. Poor educational performance is seen for both genders. Thus, researchers recommend the use of rewarding techniques and insist that teacher resort to other types of punishment rather than physical. These findings have been validated in other studies and indicate that punishment leads to negative outcomes (Davoudpour, 1993).

Studies outside Iran also present similar results and show that praise and verbal criticism are more effective methods of education among different groups of students with varying levels of social status. According to the results, praise is an adequate motivation for both groups. However, it leads to positive outcomes in children of higher social status whereas it negatively impacts those of lower social status. Moreover, in order to make this group aware and activate them, face to face negotiation and appropriate rewards can have good results (Everstone, 1975).

Findings by Harter and Lepper indicate that intrinsic motivation in students is reduced by working to achieve a higher score or a reward.
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(Daneshpazhouh, 1996). Powel highlights the necessity of having intrinsic motivation together with extrinsic rewards. However the latter only work as stimuli and must be in the form of unpredictable rewards. Other studies also point to the necessity of using rewards instead of punishments to obtain desired results (Chence, 1992).

A study on black students and discipline policies showed that previously families and teachers tended to use punishment in order to prevent criminal and aggressive tendencies (in an attempt to create fear rather than retain self-confidence). However, this is not a correct path; in contrast, parents must become involved in this matter at earlier times in the lives of their children (Parker, 1978).

3. CONCLUSION
In conclusion, it is possible to note that studies in Iran and outside Iran are not consistent. Unfortunately, physical punishment is still seen in Iranian schools. Most often, extrinsic rewards are used to motivate students without paying attention to intrinsic rewards. Studies in developed countries indicate that physical punishment has ceased to exist subsequent to the 18th century and these countries are looking for ways to motivate students to find better inner rewards.

Taking all the research effort inside and outside Iran into consideration, it is possible to conclude that intrinsic reward is the best and most stable way to increase motivation without resorting to punishment which is associate with a great number of adverse outcomes. However, punishment is an integral part of education and must be used from time to time although with sufficient caution.

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