

CHAPTER 2: BEHAVIORIST APPROACH

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Behaviorist Approach

First of all, behaviour is composed of reactions and movements that an organism gives and does in a certain situation. The term, behaviour is mostly used for actions that can be observed from outside. Behaviorist learning approach mostly focuses on how behaviours are acquired. Behaviorist approach claims that learning can develop by means of establishing a connection between stimulus and behaviour, and that any behaviour can be changed through reinforcement.

Behaviorists address learning as a mechanic process and give particular importance to objectivity. According to behaviorists, people are not good or bad from birth. Experiences and environment constitute a human's personality. According to them, human brain can be compared to a black box. Neither can we know what is going on in this black box nor do we need to know it. What is important is not what is happening in this black box, but what is important is what goes in this black box (input) and what comes out of it (output). Outputs are objective, observable and measurable. Inputs and outputs can be adjusted, arranged and controlled. What is important is not the senses of a person, but the reflection of them.⁷ The pioneers of behaviorist approach are I. Pavlov, J.B. Watson, E.L. Thorndike, E.R. Guthrie and B.F. Skinner.

History of Behaviorist Approach

By the early 20th century, the science of psychology has had important turnouts, 20-30 years after Wundt established the first psychology laboratory. Of all these turnouts, the method of introspection is the leading one. Wundt and his followers thought that the subjects such as conscious and feelings expected to be studied by psychology, could be studied just by introspection and they didn't consider it risky to use introspection as a scientific method. Psychology can use introspection as a scientific method since it deals with inner lives of people just as sciences about outer world use external observation as a scientific method. However, many have considered objectivity and reliability of introspection as a real problem.

Another development in those years occurred in the world of science. Physical sciences made a great progress in those years and especially physics changed the world of science fully. Moreover, the philosophical tradition behind physics constituted the base of people's questioning most of the things. Another development in the early 20th century was that functionalism was on the rise within the scope of psychology. Some phenomena such as conscious, which were accepted to be a structure before started to be accepted as a process helping to adapt to the environment. Doubtless to say, Darwin's evolutionary theory also influenced this idea. Darwin's ideas about living beings that had to adapt to the environment in which they were living also made tremendous impact on psychology. Another development that can be evaluated in this context is the study of animal psychology. Animals' psychological situations turned into a research subject under the influence of Darwin. It was thought that animals had some qualities such as conscious as well as perception, distinguishing.

An article (psychology through the eyes of behaviorist) written by John Broadus Watson in 1913 in such a positivist environment was revolutionary. In his article, which changed both the methods and subjects of psychology, Watson stated that it was not scientific for psychologists to deal with unobservable phenomena such as conscious or thought, and that science had to deal with observable behaviours. Doubtless to say, Watson's these ideas have a background, in other words, Watson did not suddenly felt it necessary to boom like this. Watson could evaluate the spirit of time well and could read the developments well. Although some other important names of behaviorist approach

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such as Thorndike and Pavlov displayed some manners that could be included in behaviorist approaches before, Watson's article is accepted as the birth of behaviorist approach.

The period that started with Watson's article is called as Watson's behaviorism and it is accepted to last until 1930. The second phase, which comprises the studies of Edward Tolman, Edwin Guthrie, Clark Hull and B.F. Skinner, is called as new-behaviorism and it lasted until 1960s. In this period, behaviorists claimed that (a) the base of psychology was composed of studies about learning, (b) behaviours could be explained by principles of conditioning and (c) psychology had to comply with the principle of functionalism and that a concept that could not be defined functionally could not be studied, either.

The third phase is the period that has been lasting since 1960 and it is called as new-new-behaviorism or social behaviorism. The pioneers of this phase are Albert Bandura and Julian Rotter. Cognitive elements were added to behaviorism in this period. Behaviorists of this period think that it is not true for behaviorism to deny mental and cognitive processes. Even Bandura named his theory social-behaviorism first and then replaced this name with social-cognitive theory while Rotter called his theory social learning theory.

To have a general look at behaviorists, there are two kinds of behaviorists: methodological behaviorist and radical behaviorist. While Bandura and Rotter are included in the group of *methodological behaviorist*, Watson and Skinner are included in the group of *radical behaviorist*. While radical behaviorists believe that psychology should study just the observable behaviours and environmental processes, methodological behaviorists think that cognitive processes can also be studied, but methods of behaviorist approach should be used. (Schultz and Schultz, 2007). According to another classification, there are three types of behaviorism: *methodological behaviorism* claiming that psychology is the science of behaviour, not mind; *psychological behaviorism* claiming that the reason of behaviour is not internal (such as mental processes) but external and *analytical (philosophical or logical) behaviorism* claiming that mental concepts and processes can be defined in terms of behaviorism. This variety also signifies that behaviorist approach includes different ideas.

On the other hand, when we come to today, behaviorism not only has lost strength but also seems to be defeated by cognitive revolution. Put strict behaviorists such as Watson, Pavlov and Skinner aside, new-new behaviorists state that they are cognitive-behaviorists. Even, according to a research, two thirds of the members of American Behaviour Analysis Association established depending on behaviorist approach define themselves as cognitive-behaviorist.

Fundamentals of Behaviorist Approach

As is mentioned above, behaviorism has passed through three phases. It is clear that different ideas have been accepted in each of these phases. However, behaviorism is basically an approach founded by Watson and it is doubtless that it has got some fundamental qualities. These fundamental qualities have been influenced by the conditions of that day. The first behaviorists who tried to gain scientific qualities to psychology were influenced by physics to a great extent and even they "imitated" them (Ormrod, 1990):

1. A person's learning is similar to other living things' learnings. The same principles are valid about a person's learning in the same way a dog learns. So, behaviorists use the term, organism in their definitions and the term, organism comprises both people and animals.
2. Depending on the first principle, behaviorists try to explain human behaviour by means of the studies carried out with animals. Of course, there are a lot of reasons (such as being reinforced and raised easily), but the most important reason is explained by Tolman in that way:
"Let's watch what mice live in cages, these animals cannot go out at night while a researcher plans to carry out an experiment. ... They also don't have a conflict of class or race and they avoid politics, economics and psychological notices."

In short, it seems quite possible to isolate variables well while doing experiment with animals. Even Pavlov built a special building in which he thought he could control all kinds of physical stimuli.

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3. Like John Locke's understanding of human mind, human is like a blank sheet from birth. The environment shapes it. (Mind is not a term used by most of the behaviorists.)
4. Learning can be examined by means of focusing on measurable and observable events such as physical subjects.
5. Most behaviorists believe that people's qualities such as feeling, idea, motivation cannot be observed or measured directly and so they cannot be handled and studied scientifically. Organism is a "black box." What goes in (stimulus) and what comes from (reaction) the box is measurable and observable. However, what is going on in the box cannot be understood. So, it is not included in the subjects of psychology.
6. Principles of learning are based on the connection between stimulus and reaction.
7. Behaviorists use the term of conditioning rather than learning. According to this, organism is conditioned (to give a certain reaction) by environmental stimuli in learning. So, such kind of learning takes place out of the control of the organism.
8. Learning is said to take place only when there is a change in one of the observable behaviours of the organism. If there is no change in the behaviour, it is clear that learning doesn't take place.
9. Learning can be stated and expressed in a short and brief manner. All learnings can be explained through the same simple rules whether they are simple or complex.

Basic Concepts of Behaviorist Approach

While behaviorist approach claims that the research subject of psychology should be observable behaviours, this approach also claims that all behaviours have learning as its base and that learning is conditioning. According to behaviorist approach, there are conditionings at the base of human behaviours. Behaviorist approach came out against concepts that express mental processes such as mind and conscious. The basic concepts of behaviorist approach are:

Conditioning

Behaviorist approach claims that learning takes place through conditioning. Conditioning occurs in a way that an organism matches a certain stimulus around with a certain reaction. When a reaction is associated with a stimulus apart from a stimulus that naturally moves itself, it is said to be conditioned. Conditioning can be divided into two such as classical and operant. Classical conditioning states that a neutral stimulus is matched with an unconditioned reaction while operant conditioning states that the possibility of an organism to display a certain behaviour again through reinforcement.

Organism

Behaviorist approach prefers using a more general term, organism instead of human or individual. The term, organism included both people and animals.

Reaction

Behaviorist psychologists are also called S-R theorists. In this relationship, reaction is a behaviour displayed by the organism to a stimulus.

Stimulus

Stimulus is composed of changes in the internal and external states that move the organism. For a great part of behaviorist approach, this change of state is mostly external. They may not deal with internal changes of state.

Reinforcement and punishment

Reinforcement is the process of increasing the possibility of an organism to display behaviour to a certain stimulus once more. The stimulus used in this process is called reinforcer. Reinforcers help a motivation of the organism to be satisfied at least to some extent. The responses to an organism's behaviour may be three kinds: (a) reinforcement, (b) punishment and (c) not reinforcing. While reinforcement increases the possibility of behaviour to be displayed once more, punishment is used to increase the possibility of not displaying a certain behaviour. On the other hand, not reinforcing means not giving any response and it generally decreases the possibility of behaviour to be repeated.

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In general, behaviorists are against punishment. Because punishment does not give any clue to the organism about which behaviour it should display as well as causing some negative feelings. Or, in more familiar words, punishment teaches what should not be done rather than teaching what should be done. Such a case is not included in definitions of learning and education. Because education tries to teach a student what she/he should do rather than what she/he shouldn't do. If we come to think from the point of organism, reinforcement guides organism about what it should do while punishment does not include a guide about what to do. Moreover, the studies have shown that reinforcement is more efficient than punishment.

Reinforcement, which can be understood as rewarding in daily language, is divided into two as positive and negative. While positive reinforcement means adding a nice stimulus to the situation in which the organism lives, negative reinforcement means eliminating a bad stimulus from the situation. From the point of student, giving chocolate to a student who displays a good behaviour is positive reinforcement. Allowing a prisoner who displays the expected behaviours in jail to go home for the weekend is negative reinforcement, because the prisoner is allowed to avoid prison or to get rid of the limitations on his/her freedom (for a certain time).

Punishment is also accepted to be in two types. In the first type of punishment, an unpleasant stimulus is added to the situation in which an organism lives while in the second type of punishment, a pleasant stimulus is eliminated from the environment. It is the first type of punishment if a student who doesn't do his/her homework suffers from physical violence while it is the second type of punishment if his/her toys are grabbed.

Extinction

"Repetitions that are not reinforced tend to fade away." Conditioning should be reinforced at least from time to time in order to continue after it is established. When behaviour is not reinforced, it tends to disappear after a time.

Generalization

Generalization is called an organism's displaying the same conditioned reaction to a stimulus similar to the one to which the organism naturally responds.

Discrimination

It expresses organism's ability to differentiate two separate stimuli. The process of discrimination should be processed especially when stimuli are given the same reactions. Otherwise, the organism will tend to give the same reactions to both of the stimuli even if they are different.

Reinforcement ratio

Another concept of behaviorism is reinforcement ratio. Skinner defined different applications of rewarding an organism depending on time and behaviour. Carrying out reinforcement with variable and steady intervals and ratio is called application of reinforcement ratio.

Spontaneous return

A forgotten behaviour starts to be displayed again after a certain time. Behaviour fades away when it is not reinforced, but it has also been observed that after a certain time, a learnt behaviour starts to be displayed again. This is called spontaneous return.

High-level conditioning

Conditioning is associating a stimulus with a reaction. High-level conditioning occurs when an organism is provided to give reaction to a new stimulus as a result of associating a different stimulus with the related stimulus.

A. Pavlov – Classical Conditioning

Ivan Petrovich Pavlov (1849-1936) is one of the most well known people of psychology. Pavlov, who was considerably responsible and ambitious in terms of sense of responsibility and ambition and

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decisiveness to work, sacrificed a lot of things apart from scientific research for science. Pavlov was also a careful scientist. For example, he built a mechanism for dogs' mouth in order to measure the juice they secrete for the sake of providing his studies with scientific validity. Then, he designed three-storey Tower of Silence, whose rooms were isolated from each other, which was sunk in sand, which was surrounded by a ditch filled with straw, that did not let air in when closed in order to prevent dogs from being influenced by any external stimuli. Here, the purpose is to maintain that reaction comes from just the stimulus.

Pavlov was a Russian physiologist who carried out studies on the functions of heart nerves, primary digestive glands and conditioned responses. His studies on primary digestive glands gained him Nobel Prize in 1904. His studies about conditioned responses are an accidental result of his studies about digestive glands. While Pavlov was trying to do a research about the function of juice secreted by a dog when it was given food, he noticed after some time that dogs began to secrete juice without waiting for food. Dogs, which saw their keepers or even heard their keepers' footsteps started to secrete juice. Thus, Pavlov found out that dogs' reflexes were moved by other events happening at the same time with the real stimulus. Pavlov, who committed rest of his life to do research on this subject, carried out a lot of studies with a big group of researchers and investigated this subject associating it with many concepts used by behaviorist approach today.

Pavlov was interested in reflexes. The term, reflex means behaviour that an organism brings from birth and that is displayed to a certain stimulus in daily life. Dog's secreting juice for the given food is a natural reflex. First of all, it is important to clarify some basic concepts used by Pavlov in his studies. Unconditioned stimulus is the stimulus that causes an organism to display a certain reaction without learning having been occurred yet. In an ordinary experiment, food is an unconditioned stimulus because it causes the dog to secrete juice before learning occurs. Unconditioned response is the reaction that the organism displays to this stimulus. The juice secreted by the dog to the food is unconditioned response. On the other hand, conditioned response appears when the dog gives reaction to a stimulus to which it should not react normally. The response of juice displayed by the dog to the picture of food or to researcher shows that the researcher or the picture of the food has gained the quality of conditioned stimulus. The response of juice in this case is also conditioned response. And this process is called classical conditioning. We can say that classical conditioning is a process in which a response displayed by an organism to a stimulus under natural conditions is also displayed to another stimulus. The dog starts to display the response of juice, which it gives to food in an ordinary experiment to researcher, or the picture of food.

Behaviorism expresses shaping behaviour. In classical conditioning, shaping a dog's behaviour is possible through reinforcement. Reinforcement means giving unconditioned stimulus again in classical conditioning. In the experiment carried out by Pavlov, the food given to the dog is reinforcer and the dog continues to secrete as long as it is given food. In relation to this, when the food is not given for a certain period of time, extinction occurs and the dog stops to give the response of secretion after a time. If the dog is expected to continue to give the response of secretion, it is necessary to do reinforcement and to go on giving food.

Pavlov did not make any reference to high-level mental processes in the animals used in the experiments in those years. At the time Pavlov carried out his studies, animal researches were potentially being carried out and animals were accepted to possess high-level mental qualities such as conscious and intelligence. Pavlov described his studies, which he carried out quite tangibly and functionally, and he contributed to the development of a neutral methodology in psychology. Joseph Wolpe, who developed the approach of behaviour therapy, took Pavlov's studies as the basis of his studies.

According to Pavlov, both human and animal, each is a machine. They are complex machines, but in the end, they are just machines.

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Classical conditioning can be used for shaping many behaviours of human and animals. Since it is about natural and inborn behaviours, it is an effective technique to shape animals' behaviours. Likewise, it can also be used to shape the behaviours of children who are thought to continue naturalness to a great extent. How unconditioned stimulus should be is clear; it should not be conditioned and it should have a direct relationship with response. On the other hand, unconditioned response should be an inborn response that is given to an unconditioned stimulus under natural conditions. Although it is very easy to prepare these conditions for animals, it is more complex for these conditions to take form in humans.

Classical conditioning is true for humans especially about feelings since people's feelings are inborn and natural to a great extent. For example; fear is one of the feelings used by the organism to protect it. When an organism comes across a danger about continuing its life, it feels fearful. Fear is inborn, but it is shaped by classical conditioning that why and how fear is felt. Fears in daily life and also love and like are all results of classical conditioning. A child matches doctor and painful experiences during a doctor treatment and starts to be afraid of doctors. Likewise, people like other people with whom they enjoy themselves.

People tend to generalize conditionings that are powerful for an organism such as fear since this is an important situation for people. When people start to be afraid of a stimulus, they tend to generalize it. A child who is afraid of doctors will probably generalize white coat and start to be afraid of everyone with white coat. Another example, which shows classical conditioning in humans, is reflex. Reflexes are people's inborn behaviours. So, they can be easily shaped by classical conditioning. When a person has his/her mouth water when someone says "lemon", this becomes a good example. The person matches the word, lemon and lemon, itself. Thus, the response of having his/her mouth water given to lemon is also moved when he/she hears the word, lemon. People's reflexive behaviours can be shaped by classical conditioning since start of a reflex depends on an external stimulus, not on the organism. In classical conditioning, the organism is passive receiver of and reactor to environmental conditions.

B. F. Skinner – Operant Conditioning

Burrhus Frederick Skinner (1904-1990) is one of the most important and effective people in the history of psychology. Skinner, who had a wide range of interest areas, also wrote novels as well as making some devices such as Skinner box, crib and teaching machines.

One of the most important features of Skinner that differentiates him from other behaviorists is that he avoided theories. Being a very strict positivist, Skinner attributed great importance to experimental data. As a result of having an idea of mechanic human, he claimed that person was a blank organism (reminds the view of tabula rasa), that an organism had nothing in itself that would help to explain a behaviour, that human behaviour was determined by external powers and that people displayed behaviours that could be predictable within the framework of certain laws. However, it is necessary to underline the fact that Skinner did not deny mental events, but he claimed that mental events were not useful in explaining human behaviour and that these mental events were not suitable to use in scientific researches.

While Pavlov was interested in organism's behaviour displayed against a certain stimulus, Skinner got interested in behaviors that occurred without the presence of any external stimulus, which he called operant behaviour. While Pavlov was interested in conditioning in natural behaviour, Skinner got interested in conditioning in unnatural behaviours. In operant conditioning, there is no stimulus (at least, at the beginning). However, this is not because there is no stimulus, this means that stimulus is not within the border of awareness or it is not clearly apparent at the beginning. Another simple difference between classical conditioning and operant conditioning is that operant behaviour affects environment although reactional behaviour has no effect on the environment. In other words, in classical conditioning, the dog's behaviour has no effect on the environment. The dog just reacts to the given stimuli. Even, one of the most important features of classical conditioning is that the organism should not need to do anything, and even shouldn't do anything. Pavlov stated that it was

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necessary for an organism to have no attitude towards stimulus in order conditioning to take place. Namely, a dog should not have any attitude towards a bell; in other words, the dog should not have a quality such as liking or avoiding bell, in order to be conditioned. On the other hand, in operant conditioning, everything depends on organism's behaviour. If the organism does not display the related behaviour, conditioning does not occur while the organism changes the environment in which it lives; at least, it puts a reinforcer in the environment, which is a nice stimulus. This is what is stated in general, that's to say, although reinforcement comes before behaviour in classical conditioning, it comes after behaviour in operant conditioning. Skinner believed that most of human behaviours were operant behaviours and he claimed that the best thing to do for behavioral science was to find out how an operant behaviour could be conditioned and faded away.

Skinner studied on mice in the fundamental experiment of operant conditioning. The mouse, which was put in operant box (or Skinner box) developed by Skinner, himself, displayed very different behaviours at first. What is aimed at in operant conditioning was having the mouse press lever in the box. While the mouse was doing different things, it accidentally pressed the lever. Once it pressed the lever, food dropped in the box. Although the mouse did not establish a relationship between food and pressing the lever at first, it started to establish a connection between them after some repetitions. Although it was slow at first, the mouse's behaviour to press the lever increased in a short time. Skinner used the term of response rate in order to determine mouse's behaviour operationally. According to the law that he called law of acquisition, the power of a performance increases when reinforcer follows it. The power of the behaviour to press the lever increases as long as it is followed by the food. The reinforcer here is to give food after behaviour and food turns out to be a reinforcer.

The behaviour of an animal, which is always reinforced, continues as long as reinforcement goes on. Extinction occurs when reinforcement disappears. But there is a problem at this point: does it need to be reinforced all the time? This case was handled on a day when Skinner could not find money for reinforcer. When Skinner could not find a financial support for the food to be given to mice, he started to do experiments with this question in mind: "What happens if I rarely reinforce instead of reinforcing all the time?" The way to be followed in these experiments, namely, when the reinforcement would be given and would not be given, was conceptualized as schedule of reinforcement. Therefore, the rules that regulate when reinforcement will be done constitutes schedule of reinforcement.

When studies about reinforcement schedules got started, Skinner preferred to reinforce at regular intervals at first. When reinforcement is given every three minutes, fixed interval reinforcement schedule is used. Studies have shown that the less time there is between reinforcements, the more efficient reinforcement is. Giving salary to the workers at the turn of each month is an example of this. Payment is done according to the time spent on that job, not according to the job done. In such cases, when the time between reinforcements increases, the rate of reacting decreases. In the case of extinction, behaviours that are reinforced at fixed intervals are more resistant. Namely, a behaviour reinforced at fixed interval is extinguished more difficultly when compared to a behaviour reinforced all the time.

Skinner used reinforcement schedules considering behaviour after reinforcement considering time. Reinforcing every three actions of an organism instead of reinforcing every three minutes is fixed ratio reinforcement schedule. This kind of reinforcement schedule, which is also used in daily life, is suitable for work at piece rates used especially in industry. A worker who gets payment after each ten pieces of work gets reinforcement according to this schedule. Animals of fixed ratio reinforcement schedule give response more than animals of fixed interval reinforcement schedule. This is accepted to be the evidence of the fact that ratio schedules are more effective than interval schedules.

There are also variable reinforcement schedules apart from fixed reinforcement schedules. They are called variable interval and variable ratio reinforcement schedule since they can consider time and behaviour. According to variable interval reinforcement schedule, behaviour of an organism is reinforced at variable intervals. Reinforcement is done sometimes every three, every five or every four minutes. Similarly, cases in which sometimes four and sometimes five behaviours are reinforced are

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called variable ratio reinforcement. The last type of reinforcement schedule is random reinforcement. The most effective reinforcement schedule is random reinforcement, because it is not certain when reinforcement will occur. And this makes the organism alert and careful all the time.

It is necessary to state that timing is very important in relation to the schedule, which is more efficient when reinforcement occurs with short intervals. According to behaviorist approach, timing is very important, because the earlier it is, the more effective it is. The time between the bell ring and meat in classical conditioning and the time between pressing the lever and food dropping down in operant conditioning should be very short. The longer this time is, the longer it takes for conditioning to occur. In other words, the animal has difficulty in establishing a relation between two stimuli or between behaviour and reinforcement.

Skinner thought that verbal behaviours of people were different from animals. Although people are different from animals in terms of verbal behaviours, acquiring verbal behaviours depend on the same rules as other types of behaviours. As is the case with other behaviours, a person acquires language through a system of reinforcing correct use of language and not reinforcing incorrect use of language. This idea also lies behind children's repeating their mistakes. If adults meet incorrect pronunciation of a child with pleasure, the child will tend to repeat this mistake.

One of the contributions of Skinner to behaviorism is the concept of behavior modification. This approach expresses changing human behaviours through developed rules and principles, and it especially uses positive reinforcement. A very common example of this is the case of a child who cried to get what she/he wants. If what the child wants is bought, the possibility of the child to cry in order to get what she/he wants at a later time. Because what he/she wants is bought when she/he cries. However, it is a more preferable case to reward the child when she/he doesn't cry.

Another application of Skinner's ideas is about IQ Zoo programmes. In these programmes, there are animals that dance with music, that pull a paper of luck and gives it to a person, that get on some kinds of vehicles that roll a Wheel. 6000 animals have been trained and used in different sectors in USA at some time.

Another contribution of Skinner to education is programmed instruction. Programmed instruction means directing a student by means of reinforcing his/her responses given to teaching materials in a manner of small progresses. Although it was not successful in early 1960s when it was first developed, it is used in a very effective way with the development of computers today.

The student is exposed some questions and he/she is allowed to go on only if she/he gives the correct answer. Thus, the student can pass to higher levels as he/she learns. Programmed instruction, which can be defined as reinforcing the suitable behaviour of a student, is one of the most important contributions of Skinner to education.

Other Important Behaviorists

When someone says behaviorism, it is doubtless that first of all, Pavlov and Skinner come to mind. However, there are also some other behaviorists who were also quite effective within this field. Watson, Thorndike, Tollman and Guthrie are among them.

John B. Watson (1878-1958)

Although behaviorism is closely related to Pavlov's experiments in early 1900s, it was Watson who established behaviorism in 1913 with his article. Watson, who claimed that human behaviours and animal behaviours did not have certain lines, stated that psychology had to take behaviour as its basis and it had to aim at guessing and controlling behaviour in order to be a real science. According to Watson, psychology should investigate why certain behaviour comes out and should find out ways and methods to control behaviour. Watson suggested to eliminate mind, conscious, what is going on in brain from psychology and introspection as the method.

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According to Watson, behaviours can be simple just like reflexes while they can also be very complex. Complex behaviours are called action. Actions such as eating, reading, building are complex. However, no matter how much complex an action is, they can also be handled in terms of simple actions. Responses can also be divided into implicit/explicit or learnt/unlearnt. Responses that psychology will investigate should be somehow observable. Watson claimed that observable behaviours had to be investigated by means of separating them into the smallest unit, to the responses of muscles and nerves. According to Watson's behaviorism, behaviour is separated to the smallest unit.

Although Watson did not establish his own theory, he was quite efficient in establishing and popularizing behaviorism. Watson's another contribution to the world of science is little Albert experiment. In this experiment, an eleven-month-old baby called Albert was used. Albert was shown a white mouse and a loud noise was given (hammering grate) after that. In a short time, Albert began to be afraid of Mouse. Later, Albert began to give the same response to other stimuli such as rabbit, fur coat, Santa Claus. This is an example of stimulus generalization research in this field. Depending on such researches, Watson claimed that people's fears, anxieties and such feelings result from conditioning in early childhood.

E. L. Thorndike

Edward Lee Thorndike (1874-1949) is said to be the greatest learning theorists of all time in some by some sources (Hergenhahn, 1982). Thorndike was a psychologist who carried out studies not only in the field of learning but also in other fields of education. He claimed that stimulus and response are connected to each other about learning. According to him, a neural connection is established in the organism when learning takes place. He called his theory as connectionism.

According to Thorndike, the basic way of learning is trial and error. In the puzzle box that he developed for his experiments, the animal has to display a series of complex behaviours in order to get out. The cat, which displays various behaviours at first, can display the proper behaviour after many trials. At this phase, a connection is established between the stimulus (box) and the cat's response to pull the clip to open the door. While a certain period of time passes for the cat to display behaviour at first, it can display the behaviour of opening the door immediately in time. Learning occurs gradually while it is not related to mental processes such as thinking and comparison. These ideas have made Thorndike one of the pioneers of behaviorism.

Thorndike thought that all mammals including human beings were subject to the same learning principles. He asserted three laws about learning process before 1930s: law of exercise, law of effect and law of readiness. Law of exercise is composed of two components. The first component is the rule of usage, which states that a response is strengthened as it is given to a stimulus. The second component is, on the contrary, the rule of not using and according to this rule, when a response is not given to that stimulus, the power of the connection decreases. The rule of timing is also true here and the more time there is between stimulus and response, the less powerful the connection is.

The second law is law of effect. This law states that a response will be learnt when a response given to a stimulus is satisfactory, and the response will not be learnt when a stimulus is not satisfactory or it is disturbing. The behaviour of the cat is learnt, because this response causes a satisfactory result of opening the door and getting out. Thus, the possibility of the cat to give the same response at a later time increases.

The third law is the law of readiness and it claims that when a person is ready for an action, he/she will get satisfied with learning and the connection will be powerful, but carrying out actions for which a person is not ready will be just like a punishment. So, if a person has to display certain behaviour when she/he is tired, this will be disturbing for him/her.

Thorndike reviewed his theory and made some changes and amendments after 1930. The change about the law of effect is about the role of punishment. According to this, while reward makes connection more powerful, punishment makes this connection weaker. As an organism established

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new connections, older ones seem to weaken. According to Thorndike, punishment does not have one forget a behaviour, but just suppress it.

Tolman

Edward Chace Tolman (1886-1959) is one of the first defenders of behaviorism. Although he received lectures about Gestalt psychology at first, he adopted Watson's view of behaviorism after he got aware of them. As distinct from other behaviorists, he developed the idea of intention in behaviour. His concept of intentional behaviour is quite different from the ideas of other behaviorists. Other behaviorists do not have the concept of intention, in other words, the organism do not have any intention while displaying behaviour. Although it seems that the concept of intention refers to a mental intention, Tolman did not use this concept in terms of mind. However, intentional behaviour puts him somewhere between behaviorist approach and Gestalt psychology.

In terms of Watson's ideas, Tolman was not interested in singular behaviours and stimulus-response connections, but in general level of response, which he called molar behaviour. While Watson claimed that behaviours should be handled and examined through separating them into the smallest units as much as possible, Tolman thought that it was necessary to deal with total response, not with muscle and nerve movements. Tolman stated that all behaviours occurred in line with a purpose.

Another contribution of Tolman is the concept of intervening variable. He claimed that behaviours got started by intervening variables. These intervening variables are internal motivations, heredity, past experiences as much as external stimuli. When an organism displays behaviour, she/he behaves under the influence of motivations about an external stimulus, inborn genetic features, past experiences and age factor. This idea shows that Tolman is not a S-R theorist, but S-O-R theorist in that S-O-R stands for Stimulus-Organism-Response. Tolman called his idea as functional behaviorism. Tolman reviewed his theory after 1950 and added some concepts to his theory such as needs, motivation and behavioral area.

One of the contributions of Tolman to learning psychology is the concept of cognitive map. Living beings shape a map of their environment in their minds. Tolman's experiments with the rats in the maze showed that without any punishment or reward, rats could easily find the hidden food by the help of cognitive maps of the mice, which only walked through the maze. Cognitive map is a concept that is part of maze learning which is another concept introduced by Tolman. Maze learning is a kind of learning that an organism does unconsciously. Rats walking through maze do not do this in order to make the cognitive map of the maze but they make up the map while walking around and this is latent learning.

As a result, Tolman gained some concepts such as intentional behaviour, molar behaviour, internal variable, cognitive map and latent learning to the field of learning psychology. Although he is a behaviorist, he is a behaviorist who is near Gestalt about learning psychology.

E.R. Guthrie

Edwin Ray Guthrie (1886-1959) developed behaviorist approach within evocative approach. According to the law which he called law of contiguity, if an action with a contingent stimulus is repeated, the stimulus tends to be followed by that action. This law can be accepted as another expression of behaviorist opinion. Guthrie contributed to learning psychology in two important ways. His first contribution is the idea that learning occurs at first trial. According to Guthrie, learning occurs at last and one time in real life. According to him, rewarding or repetition are not important for learning. The organism tends to repeat what it does for the last time.

Guthrie's second contribution is about the methods of having something forgotten. According to Guthrie, there are three ways to have a behaviour forgotten:

1. Method of threshold: It means differentiating a stimulus gradually and slowly by means of giving this stimulus within the borders of perception difference threshold. The person thinks that she/he comes across the same stimulus, but the difference is not noticed because the stimulus is within

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the borders of stimulus difference threshold. This technique is used in order to get on a horse by means of starting the job with a light blanket at first and then adding to the weight of the blanket and getting on the horse at the end.

2. Method of saturating: It is elimination an undesirable behaviour by means of giving a stimulus too much and often. A person who wants to stop smoking achieves his/her goal by means of smoking too much or when a horse is too tired to throw the person from his back, one can get on the horse.
3. Method of reaction formation: It means exposing the organism to an opposite stimulus to which the organism cannot display the unexpected behaviour. In order to get on a horse which throws the person from its back, the horse is tied tightly and thus its movements are limited..

As a result, Guthrie contributed to learning psychology with his theory of contiguity, learning at first trial and having something forgotten. Especially his ideas about the methods of having something forgotten are still valid today and it is used for cases such as smoking.

Evaluation and the Current State

Behaviorist approach is a movement, which came out in early 1990s both to establish psychology as a science and to adapt to the spirit of the time. In those days, many people humiliated psychology since it as a new branch of science. Even Pavlov did not take psychology seriously when he first started his studies, but he changed his mind later. What is more interesting is that his greatest contribution has been to psychology. Pavlov was not alone, psychology was a new science in those years and what and how it would research was a controversial subject. Behaviorism is an answer to the question of what and how psychology will research. In those years also, there were some other factors such as positivism being prevalent, theory of evolution and Darwin's ideas being accepted commonly, amazing developments in physics that accelerated the coming out of psychology.

Behaviorism has witnessed a great progress especially through the ideas of Pavlov and Skinner and it contributed to the research and understanding of learning to a great extent. Although experiments with animals were very common at the beginning, it is real truth that it also enlightened human learning.

Although behaviorism complied with the spirit of the time at the beginning, the spirit of time passed to the cognitive side and so behaviorism was defeated by cognitive revolution. Nowadays, cognitive approach is commonly accepted. Even behaviorists call themselves as cognitive-behaviorist rather than just behaviorist. Therefore, behaviorism got defenseless especially after the death of Skinner. Albert Bandura and Julian Rotter, who started the path with behaviorism, define themselves as cognitive behaviorist, not just behaviorist. As a result, behaviorism has completed its mission after contributing to the learning psychology to a great extent, and today it is accepted to be a theory whose deficiencies and mistakes are understood. However, this does not mean that it is not a great and efficient theory.

SUMMARY

Behaviorism is an approach, which was moved by Pavlov's studies in 1900s and established by Watson's article in 1913. Behaviorism, which basically claims that examining animal behaviours can enlighten human learning, also claims that the research subject of psychology is not mind, but behaviour and that observable and measurable behaviours can be researched. Pavlov's classical conditioning and Skinner's operant conditioning processes could explain most of human learning. Behaviorist approach, which does not consider humans' internal and mental processes, has lost its effect since 1950s when cognitive revolution got started to progress day by day. Especially after Skinner's death, there is no one left to defend behaviorist approach today. Despite of this fact, it is an undeniable fact that behaviorist approach is one of the most important and efficient theories of learning psychology.

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