

General Psychology

Paper I

B.A. I (Hons.)

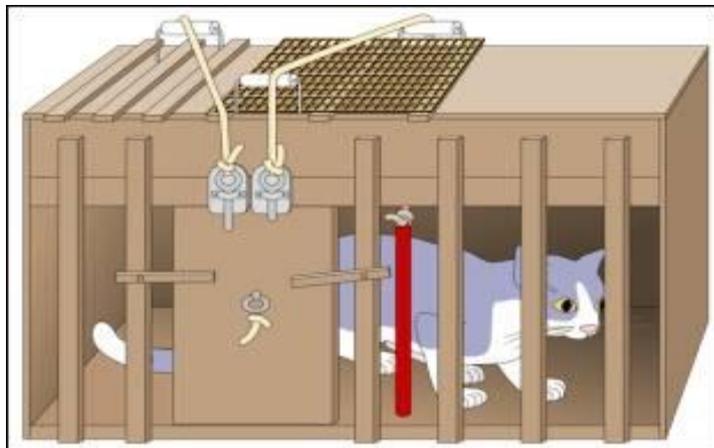
Critically evaluate Thorndike's Trial-and-Error Theory of Learning.

Trial and Error is a method of learning in which various responses are tentatively tried and some discarded until a solution is attained.

E.L.Thorndike (1874-1949) was the chief exponent of the theory of connectionism or trial and error. He was an American Psychologist who conducted Stimulus - Response(S-R) theory experiment with the help of animals. Thorndike was the first to study the subject of learning systematically using standardized procedure and apparatus. All learning, according to Thorndike is the formation of bonds or connections between stimulus-response.

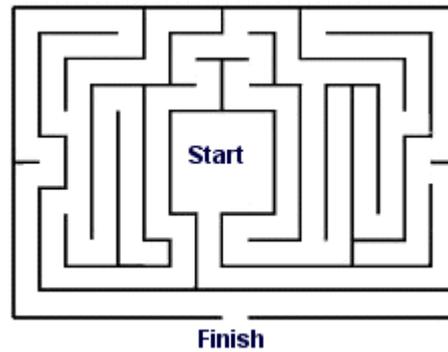
The Puzzle Box Experiment

Thorndike's Experiment on cat in the puzzle is widely known and often quoted in psychology of learning. The experimental set up was very simple. A hungry cat was confined in a puzzle box and outside the box a dish of food was kept. The cat, in the box had to pull a string to come out of the box. The cat in the box made several random movements of jumping, dashing and running to get out of the box. The cat at last succeeded in pulling the string. The door of the puzzle box opened, the cat came out and ate the food. He promptly put the cat to next trial. The cat again gave a lot of frantic behaviour but it soon succeeded in pulling the string. It repeated for several time, Thorndike noticed as the repetition increases the error also reduced i.e., Thorndike's cat showed slow, gradual and continuous improvement in performance over successive trials. He concluded that learning of cat in the puzzle box can be explained in term of formation of direct connectionism between stimulus and response.



The Maze Experiment

There are several types of maze. But in all the mazes there is provision of only one route to reach the goal. The animal learns to reach the goal through right path. Wrong path is called blind alley. Thorndike conducted several experiments on maze with rat as his subject. In maze there is a goal in which food and water are provided for the animal. A hungry rat was placed in the maze to reach the goal. After several trial and errors, the rat could learn to reach the goal through the correct path.



Features of Trial and Error Learning

1. Learning by trial and error is gradual process.
2. For learning to occur, the learner must be definitely motivated.
3. The learner makes random and variable response.
4. Some responses do lead to the goal (annoying response)
5. Some responses lead to the goal. (Satisfying responses)
6. With the increase in number of trials the annoying responses will tend to be eliminated and the satisfying responses will be strengthened and repeated.
7. The time taken to perform the task (to repeat the satisfying response) decreases with successive trials.

On the basis of the above experiments the process of learning can be divided under the below mentioned conditions:

1. Drive: Drive is an essential condition for learning. This drive motivates the learner, and directs his activities to reach the goal. This was the reason that in experiments of Thorndike cat and rat were hungry. Hunger is a drive which motivated the animals to learn.
2. Obstruction in satisfaction of drive: The when the needs are not easily satisfied, the organism becomes active, and shows efforts to achieve it. This activity or trial-and-error behaviour helps the organism to achieve the goal. That is, his goal directed behaviour helps him to learn a task or work.

3. Random Movement: in the beginning, both cat and rat showed random behaviour. If the individual is confronted with any problematic situation, some types of trial-and-error behaviour are observed. He first tries to solve the problem through his random movements or activities. For example, such type of behaviour was seen in the cat when it was placed in the puzzle box.

4. Accidental Success: in course of the random activities, sometimes accidental success is achieved. During the course of random behaviour, accidentally the paw of the cat pressed the latch, and she was free from the puzzle box. This appropriate response, which was accidental, was repeated time and again by the cat, and it learned to open the door.

5. Selection of the Right Response: out of several random responses, the cat learned to select the appropriate response which helped it to come out of the puzzle box, and to get food. Thus during the course of learning, the cat and the rat attempted to select right responses for satisfaction of their needs.

6. Fixation of the Right Response: this is the last condition of learning, when the learner is confronted by a problem situation in which he has to reach a goal such as escape from a problem box or attainment of food; he does this by selecting the right response. That is response which gives satisfaction to the learner are repeated, and as such fixed or stamped.

Through the experiment, Thorndike explains that the learning is nothing but the stamping in of correct responses and stamping out of incorrect responses through trial and error.

Thorndike's Laws of Learning

i) Law of Readiness: The law states "When any conduction unit is ready to conduct, conduction by it is always satisfying. When a conduction unit is not ready to conduct, forceful conduction is annoying. When any conduction unit is ready to conduct is always annoying."

ii) Law of Effect: The law states "When a modifiable connection between a stimulus and response is made and is accompanied or followed by a satisfying state of affairs the strength of connection is increased. When a connection between stimulus and response is made and accompanied or followed by an annoying state of affairs, its strength decreases."

iii) Law of Exercise: The law states "Any response to a situation will, other things being equal, be more strongly connected with the situation in proportion to the number of times it has been connected with that situation and to the average vigour and duration of the connection."

The law has two sub parts: a) Law of Use and b) Law of Disuse

a) Law of Use states that "When a modifiable connection is made between a situation and response that connection strength is increased if it is practised."

b) Law of Disuse states that "When a modifiable connection is not made between a situation and response, during a length of time, that connection's strength is decreased." This means, any act that is not practised for sometime gradually decays.

Evaluation of Thorndike's theory of learning:

Thorndike's system had profound impact upon modern learning theory. In fact, he initiated systematic experimental studies in the field of both human as well as animal learning. Despite these, his system has been criticized on the following points-

- 1) Thorndike emphasised upon randomness in learning because he considered it as a trial-and-error process. Critics, particularly Kohlar (1947) and other Gestalt psychologists, have said that Thorndike considered animals as stupid (in puzzle boxes) making random and undirected responses, but the reality was that they were made to be stupid because they were put in such a situation that it did not give an overall view of the whole situation. Therefore, animals, critics said, were not stupid, rather the situation was stupid and it forced them to behave in a random way. But Marx and Cronan-Hillix (1987) have defended Thorndike by claiming that even in open and less controlled situations (that permits overview of the whole situation) there may be random and trial-and-error behaviour though observed less frequently than the intelligent behaviour.
- 2) Gestalt psychologists criticized Thorndike's emphasis on sufficiency of exercise principle. On the basis of their experimental findings they provided such evidences which forced Thorndike to revise his emphasis on exercise principle and add a new principle called belongingness.
- 3) Thorndike's law of effect was also a target of criticism by behaviourists. Behaviourists pointed out that Thorndike used subjective concepts like satisfaction, annoyance in the law of effect. Thorndike met the criticism by defining satisfaction and annoyance in objective and quantifiable manner. He pointed out that by the satisfying state of affairs is meant one which the animal does nothing to avoid, rather doing things that maintain or renew it. Likewise, by annoying state of affairs is meant one which the animals do nothing to preserve, rather often do things to end. These definitions were not circular because state of affairs characterised as satisfying and annoying were spelled out independently of their influence upon modifiable connections.
- 4) Another criticism of law of effect was regarding its backward effect. The question was: since the stimulus response sequence occurs prior to the reward (or punishment) how can the latter have an impact upon sequence that is already gone in time? The past is gone and effect of something can be felt in present. But this criticism, like first one, is not correct. The effect can be revealed in the probability of occurrence of the response when similar situation comes next. Hull (1952) has also made it explicit that the reinforcement acts upon the persisting traces from stimulus-response sequence that come prior to the satisfaction or annoyance.
- 5) Critics have also raised doubt regarding the automatic strengthening of a connection due to effect of regard. This position of Thorndike was strengthened by his discovery of the spread of effect phenomenon. However, the safest thing is to say that to what extent Thorndike was correct in his emphasis on automatism is still a matter to be settled. Sufficient evidences exist on both sides.

In this way we find that the trial-and-error theory of learning has been criticized on several grounds by Gestalt psychologists and behaviourists. But despite these criticisms we cannot underrate the position of Thorndike when we recollect the remark of Tolman that “Gestalt psychologists, conditioned reflex, psychologists, sign-Gestalt psychologists-all of us here in America seem to have taken Thorndike, overtly or covertly as our starting point.”

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