

UNIT 3

OBJECTIVES:

After going through this unit carefully you will be able to:

1. Understand the meaning, factors affecting Learning, Ivan Pavlov Theory, Thomdike Theory Tolman's Sign Theory & Kurt Lewin's Field Theory.
2. Understand the nature and meaning, Concept of Intelligence Quotient (IQ), Educational Implications of I.Q, the Psychoanalytic and Gestalt Schools of Psychology of psychology to education
3. Understand Spearman's Two factor theory of Intelligence, Thurstone's Group factor theory and Thomdike's Multifactor Theory and Guilford structure of intellect.

INTRODUCTION

In fact, learning is a much broader domain than one might think. If we consider is listening to music a form of learning? More often, it seems listening to music is a way of avoiding learning. But we know that your brain's response to auditory information changes with your experience with that information, a form of learning called auditory perceptual learning (Polley, Steinberg, & Merzenich, 2006). Each time we listen to a song, we hear it differently because of our experience. When we exhibit changes in behavior without having intended to learn something, that is called implicit learning (Seger, 1994), and when we exhibit changes in our behavior that reveal the influence of past experience even though we are not attempting to use that experience, that is called implicit memory (Richardson-Klavehn & Bjork, 1988).

FACTORS INFLUENCING LEARNING

Learning can be defined as a process bringing relatively enduring changes in the behaviour of the learner through experience and learning.

This definition may also reveal that learning process related with a particular teaching-learning situation is mainly centered with two things, namely-

(i) the learner whose behaviour is to be modified

(ii) the type of experience and training available for the modification in the learner's behaviour.

Therefore, the success or failure in the task of learning in a particular teaching-learning situation or environment mainly involves two types of factors, one related with the learner and other with the prevailing learning environment. Therefore, the differences observed in the results of learning or performances exhibited by a group of learners may be surely attributed to the differences present in the learner's themselves or within their learning environment. Consequently the factors influencing learning may be broadly classified as personal (learner related) and environmental (learning facilities and situations) related. The environmental related factors then can be further categorized as teacher related, content related and process related (sources available to the learners for their learning). As a result the factors influencing learning may be categorized as below:

A. Learner Related Factors

B. Teacher Related Factors

C. Content Related Factors

D. Process Related Factors

A. Learner Related Factors

The learner is the key Figure in any learning task. He has to learn to bring desired modification in his behaviour. How will he learn or what will he achieve through a particular learning act depends heavily on his own characteristics and way of learning. Such things or factors associated with him can be described as below:

- a) Learner's physical and mental health: learning is greatly affected by the learner's physical and mental health maintained by him particularly at the time of learning. A simple headache or stomach ache can play a havoc with the process and products of learning. Children who did not keep up with satisfactory physical health have to suffer adversely in terms of the gain in learning. Similarly, the mental state and health of the learner at the time of learning become potent factor in deciding the outcome of the learning. A tense,

emotionally and mentally disturbed learner cannot be expected to show satisfactory results in learning.

- b) Basic potential of the learner: The results achieved by the learner through a process of learning depend heavily upon his basic potential to undergo such learning. Such potential may consist of the following things.
- Learner's innate abilities and capacities for learning a thing.
 - Learner's basic potential in terms of general intelligence and specific knowledge, understanding and skills related to particular learning area.
 - Learner's basic interests, aptitudes and attitudes related to the learning of a particular thing or area.
- c) Level of aspiration and achievement motivation: Learning is greatly influenced by the level of aspiration and nature of achievement motivation possessed by the learner. How can we expect from a learner to achieve a thing for which he has no aspiration? One has to maintain the level of his aspiration and achievement motivation to a reasonable level neither too high causing frustration for non-achievement nor too low so as not to try for things for which he is quite capable. In this way, one's level of aspiration and achievement motivation works significantly towards gains in learning.
- d) Goals of life: The philosophy and immediate as well as ultimate goals of one's life affect the process and products of learning. His mode and ways of looking towards the things, his inclination towards the learning in a particular area and patience and persistence maintained for continuing his learning, despite the heavy odds, all depend upon his goals and philosophy of life.
- e) Readiness and will power: Learner's readiness and power to learn is a great deciding factor in the results of learning. No power on earth can make a learner learn if he is not ready to learn. Contrarily, if he has a will to learn something then, he will himself find the way for effective learning.

B. Teacher Related Factors

If the learner stands at one end of (the on-going teaching-learning process as one of the pole then inevitably, it is the teacher who is entrusted to act as the other pole for the desired flow of the teaching-learning activities in the classroom. He is the person who has to play the role of friend, philosopher and guide for initiating, interacting as well as

concluding all the activities pertaining to the classroom journey traveled along with the students of the class. Hence, teacher related factors are bound to play significant role in shaping and directing the teaching-learning process of a classroom or work situation. Let us here briefly summarize the role of such teacher related factors in the teaching-learning process.

- a) **Mastery over the subject matter:** A teacher should know the art and skill of teaching so that the students are able to realize the stipulated teaching-learning objective in a particular teaching-learning situation. He may know his subject well but for sharing, communicating and interacting various experience related to the learning of the subject, he needs specific teaching skills, art and sciences of his teaching profession. The proficiency and deficiency possessed by a teacher in this regard are quite responsible for turning the teaching-learning process into a big success or a failure.
- b) **Personality traits and behaviour of the teacher:** A teacher as a leader has to lead his students in the teaching-learning process through the magnetic influence and incredible impression left on the minds of the students on the basis of his personality traits and behaviour. He is a role model for his students. His actions, behaviour pattern and personality traits carry a great meaning to his students for being imitated and brought into practice. Therefore, much of the task regarding desirable behaviour modification, an essential large) meant for any teaching-learning act. is very much influenced by the types of personality traits and behaviour pattern demonstrated by the teacher in his action and behaviour in the classroom and work situations. Moreover, how he behaves with his students during the various types of activities and interactions carried out in the teaching-learning process also prove a decisive factor in finalizing the teacher learning outcomes.
- c) **Level of adjustment and mental health of the teacher:** How adjusted a teacher feels in his personal and professional life and the state and level of mental health maintained by the teacher carries much weight in influencing his behaviour and effectiveness needed for the effective control and management of the teaching-learning process. A teacher possessing poor mental health and lack of adjustment in his personal and professional life may prove total failure in the realization of teaching-learning objectives, whereas a teacher possessing good mental health and adjustment may prove an ideal image to his students and boon to the effectiveness of the teaching-learning process.

- d) Type of discipline and interaction maintained by the teacher: A teacher who is a good disciplinarian (democratic and persuasive) and believe in providing due interactive roles to his students in the teaching-learning process brings more positive and better teaching-learning outcomes in comparison to the teachers who are poor in terms of maintaining discipline (autocratic or lethargic) and are in the habit of providing unidirectional flow of communication by discouraging any initiative and interaction from his students.

C. Content Related Factors

In a teaching-learning process, one thing that is shared most between the learner and the teacher is the contents of the subject matter. Desired instructional objectives and educational aims can be effectively achieved only on the basis of the quality of these contents or learning experiences shared during the process of teaching-learning. Poor contents lead to poor teaching and inadequate or sometimes no learning while contents rich in the desired learning experiences suited to the nature, interest and ability of the learner always pay rich dividend in terms of the realization of set teaching-learning objectives. In brief the factors related to contents influencing teaching-learning may be broadly divided into three main categories named and discussed as below:

- a) Nature of the contents or learning experiences: Teaching-learning process is influenced by the nature of the contents, subject matter or learning experiences shared in the process. Whether the nature of the content material or learning experience provided in a teaching-learning process is formal or informal, incidental or organized, direct or indirect, proves quite a potent factor in influencing the process and products of teaching-learning.
- b) Selection of the contents or learning experiences: Proper attention, time and energy employed for the desired selection of the contents or learning experiences best suited for the realization of the teaching-learning objectives in a particular teaching-learning situation always proves decisive in influencing the process and products of teaching-learning. Therefore, it is always advisable to select content material or the learning experiences on the basis of the desired principles like principle of child centeredness, principle of activity, criterion of activity, age, grade and experiences of the learners etc.

- c) Organization of the channels or learning experiences: Selected contents or learning experiences need better organization for the effective sharing among the learners and teacher. A better organization will be more convenient and provide strength to the learners and teacher for the better realization of the stipulated teaching-learning objectives. Therefore, the methods like logical v/s psychological, spiral vs concentric, criterion of difficulty level, correlation etc. should be properly employed for the effective organization of the contents or learning experiences.

D. Process Related Factors

Teaching-learning output can always be better realized in terms of the stipulated teaching-learning objectives if the factors related to the process of teaching-learning are better planned, organized and executed in a proper way. Such process related factors have been explained as under:

- a) Methodology adopted for teaching-learning experiences: In teaching-learning, much depends upon the methods, techniques and approaches employed for the teaching and learning of the selected contents and learning experiences. Let us weigh the truth of this statement from various angles.
 - i. Linking of the new learning with the past: The quality of the result in teaching-learning depends much on the abilities of the teacher and the learner to link the present new learning with the past experiences of the learner. Past experience helps the learner to assimilate and understand the new learning by providing support as well as cementing force for this purpose.
 - ii. Correlating the learning in one area to the other: Correlation facilitates the task of teaching-learning as it allows maximum transfer of training or learning from one area to another. Accordingly, one can expect good results in learning if learning experiences are given in view of seeking correlation—(i) among the different subjects or areas, (ii) within the branches or experiences or experiences of the same area and (iii) with the real life happenings and situations.
 - iii. Utilization of maximum number of senses: Senses are said to be the gateway of knowledge and consequently the results in teaching-learning are very much influenced by the nature and type of the utilization of one's senses for the acquisition of learning experiences. A learner

who learns through the utilization of his maximum senses like sense of sight, hearing, (ouch, smell, tastes and also tries to learn by doing the things himself always reach at an advantageous point.

- iv. Provision of drill work, revision und practice: Review and practice always brings good results in the achievements of student's learning. A learner who makes use of sufficient drill work, practice work, revision and review of his learning can be expected to harvest a good yield in terms of its good retention, reproduction and utilization at the proper time.
 - v. Provision of proper feedback and reinforcement: The teaching-learning yields arc much dependent upon the nature and quality of the feedback and reinforcement provided to the learner in his learning task. One must be acquainted with the progress of his learning in terms of his strengths and weaknesses and remedial action, if needed, may be taken at the proper time. The knowledge of the results and progress may work well for providing immediate reinforcement to the learner. In addition, the learning process can be suitably designed if we take due care for the planning of proper reinforcement technique in the shape of approval of the learning response. Nodding of the head, smiling, saying good-bye. etc. bring a magic in terms of learner's interest and achievement.
 - vi. The selection of the suitable learning methods und leaching: There are sufficient methods and a number of good techniques available for the teaching and learning of different subjects and areas of experiences. The results in leaching-learning are always influenced by the nature and quality of the methods and techniques employed for the teaching and learning of a particular content, subject matter or learning experiences like those given below—
 - i. Whether or not methods and techniques are helpful in learning at memory, understanding or reflective level?
 - ii. Whether or not these are teacher-dominated, learner-centered or allow useful teacher-pupil interaction?
 - iii. Is it possible to proceed on the path of self -learning through them?
- b) Teaching-learning environment and resources: I lie learner is helped by the available resources and environment available for bringing desirable changes in his behaviour. How effectively will such changes be introduced in his behaviour depend much of the equality and management of these resources. Such things and factors affecting teaching-learning process may he listed as below—

- The socio-emotional climate available in the institution in the shape of teacher-pupil relationships, pupil-pupil relationships and school-staff relationships etc.
- The availability of appropriate learning material and facilities in terms of teaching-learning aids, textbooks, library and laboratory facilities, project work. etc.
- The proper conducive environment and learning situation, like those given below:
 - Proper seating arrangement
 - Calm and peaceful environment
 - Management and control of the factors leading to distraction
 - Cooperative and competitive group situations
 - Congenial learning environment at home
 - Provision of proper change, rest and recreation
 - Provision of opportunity for creativity and self-expression

In this way the process and products of teaching-learning are said to be influenced by the personal factors associated with the learner and teachers and the external factors (like type of content material and their proper delivery to the learner) lying within the teaching-learning environment.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for factors influencing learning](#)

STRATEGIES FOR ENHANCING LEARNING:

Current cognitive theories of learning point to the important role students' thought processes play in learning. Students need to be mentally active processors of information if learning is to occur. In these formulations, several criteria must be met if learning is to occur. First, students must attend to information to be learned. Second, students must create an understanding of the material by creating or identifying relationships amongst the to-be-learned ideas. Third, students need to relate new ideas to prior knowledge. Fourth, students need to understand that learning requires mental effort - good learners are strategic and poor learners are not, and that strategy use is the means by which learning occurs.

IVAN PAVLOV CLASSICAL THEORY

Ivan Pavlov's experiments with dogs are very well-known in the history of psychology. People built a psychological learning theory from his small accidental discovery. Pavlov's studies have helped us understand associative learning through classical conditioning.

Classical conditioning consists of associating an initially neutral stimulus with a meaningful stimulus. Thus, when the neutral stimulus is present in the absence of the other stimuli, we'll get a similar response to the one we would get if we were to introduce the significant stimulus. This ability to associate stimuli, however different they may be, helps us in many daily situations.

In order to understand classical conditioning, we're going to discuss two aspects. Firstly, we'll talk about Pavlov's experiment and his research. Secondly, we'll talk about the components that make up this type of conditioning.

Pavlov's experiment

Ivan Pavlov, a Russian physiologist, was carrying out research regarding how dogs salivated in the presence of food. One day, while working on this experiment, he noticed that the dogs began to salivate before he had even brought the food out. Simply subjecting the dogs to the conditions of the experiment was enough to provoke this reaction in them.

Pavlov concluded that his dogs had somehow associated the experiment with the imminent introduction of food. In order to unravel the mysteries of these new findings, Pavlov began to design a series of experiments. His goal was to test his hypothesis that when we present two stimuli contingently, an association can take place.

The experiment that demonstrated the existence of classical conditioning was the association of a bell sound with food. Pavlov placed salivation meters on several dogs. During the experiment, Pavlov rang a bell and then gave the dogs food. And obviously, after giving them food, the meters indicated salivation.

After introducing these two stimuli (the bell and the food) several times, Pavlov managed to get the dogs to associate them. The proof of this was that the sound of the bell alone made the dogs salivate. However, we should note that they salivated more when he brought the food out.

This experiment showed that an initially neutral stimulus can provoke a totally new response through its association with a significant stimulus.

The components of classical conditioning

We can divide classical conditioning into four main components. These components are the unconditioned and conditioned stimuli and the unconditioned and conditioned response. If we understand the relationships between these components, we'll be able to understand classical conditioning better.

Unconditioned stimulus: This is the stimulus that is already significant and meaningful enough for the subject. By this, we mean that it's a stimulus that's capable of provoking a response on its own. In Pavlov's experiment, the unconditioned stimulus was the food.

Unconditioned response: This is the subject's response in the presence of the unconditioned stimulus. In the case of the aforementioned experiment, the unconditioned response was the salivation when the dogs saw the food.

Conditioned stimulus: This is the initially neutral stimulus which doesn't generate any significant response in the subject on its own. However, through association with the unconditioned stimulus, it's capable of provoking a new response. In the case of Pavlov's experiment, this stimulus was the sound of the bell.

Conditioned response: This is the response after introducing the conditioned stimulus. In the case of this experiment, it was the dogs salivating when they heard the sound of the bell.

Dog with tongue hanging out.

Human learning

Classical conditioning consists of the interaction of these components. Presenting a neutral stimulus along with an unconditioned stimulus on many occasions will transform the neutral stimulus into a conditioned stimulus. For this reason, the conditioned stimulus will give a conditioned response similar to the unconditioned response. In this way, a new learning process emerged in response to the association of two different stimuli.

All the research that has emerged from classical conditioning has helped us understand many aspects of human learning. Thanks to this, we can anticipate phobias and also link emotions to new stimuli.

Pavlov lit the spark that enabled us to understand a lot of what we now know today about learning and conditioning.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Pavlov Theory of classical conditioning](#)

Thorndike's Theory:

Edward Lee Thorndike (1874-1949) is generally considered to have been the foremost educational psychologist not only of the United States but of the world. He contributed to research and theory in the field of learning and genetic psychology, testing and social psychology, testing and social psychology.

Thorndike first stated the elements of his theory of learning in 1913 that connections are formed in the nervous system between stimuli and response. These connections formed are illustrated by the symbols S-R. Another word used to describe these connections is the word 'bond' and hence, this theory is sometimes called a 'Bond Theory of learning'. Thorndike has written- "Learning is connecting. The mind is man's connection system."

According to Thorndike learning takes place by trial and error. Some people call it, "Learning by selection of the successful variant," accordingly when no ready-made solution of a problem is available to the learner, he adopts the method of trial and error. He first, tries one solution. If it does not help him, he rejects it, then, he tries another and so on. In this way he eliminates errors or irrelevant responses which do not serve the purpose and finally discovers the correct solution.

Thus, in trial and error method, the learner makes random activities and finally reaches the goal accidentally. Here, one thing should be remembered that in trial and error also, there are often systematic and relevant responses. Activities are not wholly random. All these activities, though apparently random are suggested to him by the situation and the learner proceeds on accordingly. The stages through which the learner has to pass are Goal, Block (hinderances), Random Movements or multiple response, chance success, selection and Fixation.

When and how the connection is accomplished was stated first in the following three laws:

A. Law of Readiness:

First primary law of learning, according to him, is the 'Law of Readiness' or the 'Law of Action Tendency', which means that learning takes place when an action tendency' is aroused through preparatory adjustment, set or attitude. Readiness means a preparation for action. If one is not prepared to learn, learning cannot be automatically instilled in him, for example, unless the typist, in order to learn typing prepares himself to start, he would not make much progress in a lethargic and unprepared manner.

B. Law of Exercise:

The second law of learning is the 'Law of Exercise', which means that drill, or practice helps in increasing efficiency and durability of learning and according to Thorndike's S-R Bond Theory, the connections are strengthened with trial or practice and the connections are weakened when trial or practice is discontinued. The 'law of exercise', therefore, is also understood as the 'law of use and disuse' in which case connections or bonds made in the brain cortex are weakened or loosened. Many examples of this are found in case of human learning. Learning to drive a motor-car, typewriting, singing or memorizing a poem or a mathematical table, and music etc. need exercise and repetition of various movements and actions many times.

C. Law of Effect:

The third law is the 'Law of Effect', according to which the trial or steps leading to satisfaction stamp in the bond or connection. Satisfying states lead to consolidation and strengthening of the connection, whereas dis-satisfaction, annoyance or pain leads to the weakening or stamping out of the connections. In fact, the 'law of effect' signifies that if the responses satisfy the subject, they are learnt and selected. While those which are not satisfying are eliminated. Teaching, therefore, must be pleasing. The educator must obey the tastes and interests of his pupils. In other words, greater the satisfaction stronger will be the motive to learn. Thus, intensity is an important condition of the 'law of effect'. Besides these three basic laws, Thorndike also refers to five sub-ordinate laws which further help to explain the learning process.

These are:

I. Law of Multiple-Response:

According to it the organism varies or changes its responses till an appropriate behaviour is hit upon. Without varying the responses, the correct response for the solution might never be elicited. If the individual wants to solve a puzzle, he is trying in different ways rather than mechanically persisting in the same way. Thorndike's cat in the puzzle box moved about and tried many ways to come out till finally it hit the latch with her paw which opened the door and it jumped out.

II. The Law of Set or Attitude:

Learning is guided by a total set or attitude of the organism, which determines not only what the person will do but what will satisfy or annoy him. For instance, unless the cricketer sets himself to make a century, he will not be able to score more runs. A student, similarly, unless he sets to get first position and has the attitude of being at the top, would waste away the time and would not learn much. Hence, learning is affected more in the individual if he is set to learn more or to excel.

III. Pre-Potency of Elements:

According to this law, the learner reacts selectively to the important or essential element in the situation and neglects the other features or elements which may be irrelevant or non-essential. The ability to deal with the essential or the relevant part of the situation makes analytical and insightful learning possible. In this law of pre-potency of elements, Thorndike is really anticipating insight in learning which was more emphasised by the Gestations.

IV. Law of Response by Analogy:

According to this law, the individual makes use of old experiences or acquisitions while learning a new situation. There is a tendency to utilize common elements in the new situation as existed in a similar past situation. The learning of driving a car, for instance, is facilitated by the earlier acquired skill of driving a motor-cycle or even riding a bicycle, because the perspective or maintaining a balance and controlling the handle helps in steering the car.

V. The Law of Associative Shifting:

According to this law we may get any response, of which a learner is capable, associated with any other situation to which he is sensitive. Thorndike illustrated this by the act of teaching a cat to stand up at a command. A fish was dangled before the vat while he said 'stand up'. After a number of trials by presenting the fish after uttering the command 'stand up', he later ousted the fish and the overall command of 'stand up' was found sufficient to evoke the response to the cat by standing up on her hind legs.

Experimental Evidences of Thorndike's Trial and Error Theory:

Various experiments have been performed on men as well as animals to study this method. Thorndike made several experiments on rats and cats. Two important experiments are mentioned here.

Expt. 1:

Thorndike's most widely quoted experiment was with the cat placed in a puzzle box. The hungry cat was put in the puzzle box and a fish, as an incentive, was put out-side the cage a little beyond its reach. The box was designed in such a way that the door of the cage can be released by some simple act like depressing a lever inside the cage.

At first, the cat made a great deal of varied attempts to reach the food in a trial and error fashion such as jumping up and down, clawing at the bars, scratching the cage, whaling around trying to push the bars, pawing and shaking movable parts of the cage etc., but all attempts proved to vain.

Ultimately by chance her paw fell on the loop of the rope and the door opened. The cat jumped out immediately and ate the fish. When next day, the cat was put in the box again, this time she took less time in coming out and in the subsequent trials the time decreased further so much so that the stage reached when the cat came out soon after being put inside by directly striking the latch with her paw without any random movement. This is how she learnt to reach its goal.

Expt. 2 (Experiment with Human Subjects):

Gopaldaswamy demonstrated trial and error in human beings through Mirror-Drawing Experiment. This is a classical experiment in the psychology of learning. In this experiment the subject is asked to trace a star-shaped drawing, not looking at it directly, but as it is reflected in a

mirror, the subject's hand movements are visible in the mirror only and not directly. The experimenter observes the movements of the hands and thus, records the time of tracing in successive trials and the number of errors committed in each trial.

In first six trials the subject traces the star with the right hand and then in the next six trials he traces it by the left hand. Two graphs-the Time Curve and the Error Curve are then drawn, which show the general characteristics of trial and error learning. In the original experiment Gopaldaswamy arranged his apparatus so that a record was automatically made of all the movements of the styles of the subject as it traced out the pattern. In this way the successive times of tracings and a record of errors was obtained.

Gopaldaswamy analyzed the errors into two groups-lower level errors and higher level errors. Those errors which do not involve any noble process on the part of the subject in tracing the star are lower-level errors and those which involve higher process of mind on the perceptual and conceptual level are higher-level errors.

He discovered that improvement in the higher-level responses correlated highly with intelligence and that the improvement in the responses of the lower-level errors did not show much correlation with intelligence. This clears the respective share of trial and error and of higher learning.

Expt. 3:

For Fundulus fishes Thorndike got a glass tub with a dividing wall of glass in the middle. In the dividing wall there was a hole through which the fish could go from one part to another. By nature Fundulus fish like to remain in shade. The glass tub was filled with water and it was put under such a situation that half of its part remained under shade and the other half was in the sunshine. The fishes were kept in the sunny portion.

They began to try to coming over to the shady portion. By trying again and again the fishes succeeded in tracing the hole of the dividing wall and reached the shady portion one by one. But, at first the fishes took more time in reaching the shady portion, then in the second attempt they took less time and in the third attempt they took the least time. Trying it again finally a stage came when the fishes happened to come one after another in a row to the shady portion

immediately in the very first attempt i.e., the number of errors of their wandering here and there amounted to a zero.

Educational Implications of Thorndike's Trial and Error Theory:

Thorndike's theory of Trial and Error and his three basic laws of learning have direct educational implications. The 'Law of Readiness' lays emphasis on motivation while the 'Law of Exercise' compels us to accept a well-known fact 'Practice makes a man perfect', and the third one i.e., 'Law of Effect' opens fairly a large scope to discuss the role of reward and punishment as an incentive in the child's learning.

Actually, motivation and learning are inter-related concepts. No motivation; No learning. Here we can remember a proverb, 'the one man can take horse to the pool of water but twenty cannot make him drink'. This statement clearly shows the impact of motivation on learning. Clearly speaking motive is a force that compels an individual to act or to behave in a particular direction. And, hence the success of a teacher lies in motivating the roomfuls of energy. His prime duty is to produce 'thirst' (a motive to drink water) in the horses. Then and only then he may succeed in making the process of learning easier and interesting.

To quote with the experiment to Tolman and Honzik (1930) which they performed in rats will be of interest and situational here. In this experiment the rats were taught to follow a complex pattern of runs and turns through a maze to reach the food. The rats were divided in three groups. First group of rats was neither hungry nor given any food at the end or trial. The second group was hungry but was not given food. The third one was hungry and given food at the end of a trial.

It was concluded that only the third group learned appreciably i.e., the number of errors went on decreasing in each attempt. The logic is simple. To be motivated and unrewarded leaves to you only frustration instead a notable amount of learning. Also nor is it worthwhile to work for a prize you do not want. Thus, it is the motive that gives the reward its value and the satisfaction of reward that fixes the learning of which it is the effect.

Briefly speaking, without motivation or drive learning is impossible, as firstly, it prods the learner into action and secondly, it introduces light and shadow into an otherwise different field.

So, teacher's concern primarily shall be the motivating of goals and releasing tensions which signalise success. Above all he should have a psychological involvement in reaching and has to be charged with values and therefore, naturally motivated himself. The advice of an old principal of a school is very pertinent here.

“Teachers, you are going to be emulated in your talk and walk by your students, but a little less. If you run, your students will walk. If you walk, your students will stand. If you stand, your students will lie down. If you lie down, your students will sleep. And if you sleep in the class, your students will die”. But, one has to admit here that the organism's level of performance can't be beyond a physiological limit, whatever incentive we provide to him. For instance, higher bonus to factory workers, more praise to students may lead to a better performance, but no athlete can jump over the Chinese wall, whatever the intensity of motivation is provided.

Another significant aspect of this theory is that to master a complex situation or to elaborate task, practice is must. It is not possible to handle each difficult situation in a single trial, no matter what the degree of motivation or reward is. One cannot blame the entire constitution of India in one reading even if the reward is a crore of Rupees or the threat is to be shot dead otherwise. Each task initially seems to be difficult and fatiguing but as practice continues, it becomes smoother and requires less effort.

Finally, we say that habit or S-R is established. An expert driver, for instance, goes on driving, listening to the radio and talking to his friend sitting by. In the light of class room teaching blundering is a natural phenomenon associated with student learning. But, the teacher should not regard this as a symptom of inefficient teaching, because this is the way the pupils learn. He should not be at all worried when blundering appears.

Insights will emerge as the blundering progresses from simpler associations to higher units. There is not royal road to success. Kennedy-Fraser, the Psychologist concludes, “The teachers who are responsible for the beginning of any new subject should be the best available, since at the point, the pupils have no defensive system of properly formed habits to protect them from the evil effects of bad teaching.”

Actually, we learn by doing. The teachers' duty should be to arrange situations in which the student has chance to discover for himself what is significant. The blundering must be directed and methods that are wholly futile must be eliminated. But at the same time the teacher must exercise, constant restraint in his supervision.

Further, both punishment and reward may play a significant role in the process of learning. But, experiments go to show that motivation is successfully handled when it is kept in the positive phase. Drastic forms of inhibition tend to spread their effects over the whole learning situation. Sometimes, the teachers impress upon the negative processes. The false response is effectively inhibited when the correct reaction is fixated and the emphasis should be on the latter process. The fixating rewards are most effective when they afford immediate and complete release.

A delay introduced between the successful performance and the releasing reward has a considerable effect on their rate of learning and co-ordination. In school, the satisfactions should be closely coupled with the activity itself otherwise the likelihood of permanent effects is small. Another aspect of motivating problem is simpler than the manipulations of tensions and releases and can be mastered by all. This is that the learner should be kept informed of his progress and promptly.

Finally, though the theory is not widely accepted for its educational significance, yet, there are certain subjects such as mathematics, tables of mathematics, memorising poetry, rules of grammar etc. in which learning by Trial and Error cannot be avoided. All reasoning subjects afford the greatest opportunity for the application of the Trial and Error method.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Thorndike Theory](#)

Sign Learning (E. Tolman)

Tolman's theorizing has been called purposive behaviorism and is often considered the bridge between behaviorism and cognitive theory. According to Tolman's theory of sign learning, an organism learns by pursuing signs to a goal, i.e., learning is acquired through meaningful behavior. Tolman emphasized the organized aspect of learning: "The stimuli which are allowed in are not connected by just simple one-to-one switches to the outgoing responses. Rather the incoming impulses are usually worked over and elaborated in the central control room into a tentative cognitive-like map of the environment. And it is this tentative map, indicating routes and paths and environmental relationships, which finally determine what responses, if any, the animal will finally make." (Tolman, 1948, p192)

Tolman (1932) proposed five types of learning: (1) approach learning, (2) escape learning, (3) avoidance learning, (4) choice-point learning, and (5) latent learning. All forms of learning depend upon means-end readiness, i.e., goal-oriented behavior, mediated by expectations, perceptions, representations, and other internal or environmental variables.

Tolman's version of behaviorism emphasized the relationships between stimuli rather than stimulus-response (Tolman, 1922). According to Tolman, a new stimulus (the sign) becomes associated with already meaningful stimuli (the significate) through a series of pairings; there was no need for reinforcement in order to establish learning. For this reason, Tolman's theory was closer to the connectionist framework of Thorndike than the drive reduction theory of drive reduction theory of Hull or other behaviorists.

The main features of this theory are as follows:

- 1) It accepts behaviourism as basis:

Main characteristics of behaviour are:

- (a) Behaviour is goal-directed i.e. it is purposive.
- (b) Behaviour makes use of environmental factors as means for getting at the goal.
- (c) Behaviour consists of the formation of cognitive maps.
- (d) The organism has a selective preference for the "principle of least effort", for arriving at the goal.
- (e) Molar behaviour is docile.

- 2) According to Tolman, the behaviour depends upon:
 - a) The need system,
 - b) The belief value matrix, and
 - c) The behaviour space.
- 3) This theory takes into consideration that learning is based upon some signs or clues leading to the goal. The organism learns not the movement patterns, but the sign-significative relations.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Sign leaning Theory](#)

Lewin's Field Theory of Learning

Kurt Lewin (1890-1947), unlike Pavlov, Skinner and Gestltian psychologists, conducted experiments on the study of behaviour of children. He utilized an elaborate experimental set-up with a view to control the child's total environment during the course of the investigation for getting detailed information.

Lewin emphasized the study of behaviour as a function of the total physical and social situation. Lewin holds that psychological laws need not be formulated solely on the basis of statistical averages. Rather the individual case is equally important.

Even if all general psychological laws were known, we would still need to understand the specific individual and 'total situation' in which he exists before we could make any prediction about his behaviour.

Thus Lewin favours an idiographic psychology in which the focus is on the individual, as opposed to nomothetic psychology, where the emphasis is on Statistical average.

Lewin describes his viewpoint in the following formula:

$$b=F(pe)$$

B represents behaviour

f is a function

P is the person

E is the total environment situation.

Lewin explains the individual behaviour on the basis of life-space. An individual's life-space depends on his psychological force. It includes the person; his drives, tensions, thoughts and his environment, which consists of perceived objects and events.

Lewin represents his theory through a diagram in which an individual is in the centre. He moves through his life-space which consists of the totality of facts that determine his behaviour at a given time.

A life-space contains the individual himself, the goals he is seeking (positive valence) or avoiding (negative valence), the barriers that restrict the individual's movements and the path he must follow to reach his goal.

Desire creates tensions in the individual and tensions come to a balancing state and the person acts. After the goal has been achieved, the organism (individual) returns to a state of repose until a new desire activates him.

In Lewin's theory, threat, goal and barrier are the main factors. An individual who has to achieve some goal has to cross a barrier. The barrier may be psychological or physical. Because of the changes in the barrier in the life-space of an individual, continuous reconstruction takes place.

Lewin's theory is called field theory as to a psychologist field means the total psychological world in which a person lives at a certain time. It includes matters and events of past, present and future, concrete and abstract, actual and imaginary – all interpreted as simultaneous aspects of a situation. Lewin states that each person exists within a field of forces. The field of forces to which the individual is responding or reacting is called his life-space.

Lewin's theory regards learning as a relativistic process by which a learner develops new insight or changes old ones. According to the theory, learning is not a mechanistic process of connecting stimuli and responses within a biological organism. Field psychology explains development of insight as a change in cognitive structure of life-space.

Lewin's Theory of Learning

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Lewin's theory may be explained as under:

Suppose a person P is moving towards a goal of getting social recognition. But to achieve the goal, he has to apologise. Now asking for apology is the barrier coming in his way. The barrier may be physical or psychological forces preventing him from reaching the goal. These forces organise themselves into a pattern which determines his future behaviour.

Lewin has classified learning into the following categories:

- a) Learning is a change in cognitive structure.
- b) Learning is a change in motivation, i.e., in valences and values.
- c) Learning is acquisition of skills.
- d) Learning is a change in group belonging.

Learning of all types involves change in perception.

Changes in cognitive structure are caused by the forces in the psychological field – needs, aspirations and valences.

Lewin thinks that level of aspiration depends upon the potentialities of an individual and on the influences of the group to which he belongs. Too high or too low level of aspiration discourages learning.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Lewin learning Theory](#)

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Lewin, Stage Model of Change Unfreezing Changing Refreezing](#)

INTELLIGENCE

Intelligence is defined in many different ways. It is one's capacity for knowledge, logic, problem-solving, understanding and creativity. It's also the ability to choose between two things and the ability to resolve different conflicts. The word "intelligence" is derived from the Latin word "intelligere," which means to comprehend or perceive. Intelligence isn't only observed in humans, but also in plants and animals. There are three main theories of intelligence in the field of psychology.

One of the most important single variables, which affect schooling, is intelligence. Intelligence is the ability to acquire and apply knowledge. Success in school and colleges and in one's own profession, social adjustment, possession of general information etc. are all associated with the concept of "intelligence". The word intelligence is derived from the Latin verb 'intellegere' which means understanding.

According to Alfred Binet intelligence is the ability for judgement or common sense. Thorndike defines intelligence as "one's capacity to deal effectively with situations". For Jean Piaget, 'intelligence is the ability to adapt to one's surroundings'. In the words of Cyril Burt, "Intelligence is the capacity of flexible adjustment." According to David Wechsler (1977): 'The global capacity to think rationally, act purposefully, and deal effectively with the environment.'

Intelligence is defined as mental capability that involves the ability to reason, to plan, to solve problems, to think abstractly, to comprehend complex ideas, to learn quickly and to learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smartness.

In simple words, intelligence is nothing but thinking skills and the ability to adapt to and to learn from life's everyday experiences.

Nature and Characteristics of Intelligence and its Development:

Intelligence is not acquired after sustained labour. It is a gift from nature. Intelligence is not memory. An intelligent person may have poor memory. Intelligence is not a skill which a worker acquires after planned practice. Intelligence is not a guarantee of a good behaviour of the individual.

To understand the nature of intelligence we need to know the classification intelligence as given by E.L. Thorndike and Garret:

1. Concrete Intelligence – It is the ability of an individual to comprehend actual situations and to react to them adequately. The concrete intelligence is evident from various activities of daily life. This type of intelligence is applicable when the individual is handling concrete objects or medicines. Engineers, mechanics and architects have this type of intelligence.

2. Abstract Intelligence – It is the ability to respond to words, numbers and symbols. Abstract intelligence is required in the ordinary academic subjects in the school. This is acquired after an intensive study of books and literature. Good teachers, lawyers, doctors, philosophers etc. have this type of intelligence.

3. Social Intelligence – It means the ability of an individual to react to social situations of daily life. Adequate adjustment in social situations is the index of social intelligence. Persons having this type of intelligence know the art of winning friends and influencing them. Leaders, ministers, members of diplomatic sources and social workers have it.

Thus we see the nature of intelligence as the ability for adjustment to environment, ability to perceive relationship between various objects and methods, ability to solve problems, ability to think independently, ability to learn maximum in minimum period of time, ability to benefit from one's own experience and the experience of others.

Therefore, intelligence is an inborn ability of an individual, the distribution of intelligence is not equal among all human beings. There is wide individual difference that exists among individuals with regard to intelligence.

Characteristics of Intelligence:

- a) The main features of Intelligence are the following:
- b) Intelligence is an innate natural endowment of the child.
- c) It helps the child in maximum learning in minimum period of time.
- d) The child is able to foresee the future and plan accordingly.
- e) The child is able to take advantage of his previous experiences.
- f) The child faces the future with compliance.

- g) He develops a sense of discrimination between right or wrong.
- h) The developmental period of intelligence is from birth to adolescence.
- i) There is a minor difference in the development of intelligence between boys and girls.
- j) There are individual differences with regard to the intelligence between boys and girls.
- k) Intelligence is mostly determined by heredity but a suitable environment necessary to improve it.

Conclusion: It can be rightly said that intelligence is the ability to adjust, to think, to understand, to reason and to act in the best possible manner. We can also conclude that during early childhood, there is a period of relatively rapid growth of intelligence followed by a slower late during adolescence.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Intelligence](#)

Concept of Intelligence Quotient (IQ)

An intelligence quotient (IQ) is a total score derived from several standardized tests designed to assess human intelligence. The abbreviation "IQ" was coined by the psychologist William Stern for the German term Intelligenzquotient, his term for a scoring method for intelligence tests at University of Breslau he advocated in a 1912 book. Historically, IQ is a score obtained by dividing a person's mental age score, obtained by administering an intelligence test, by the person's chronological age, both expressed in terms of years and months. The resulting fraction is multiplied by 100 to obtain the IQ score.

When current IQ tests were developed, the median raw score of the norming sample is defined as IQ 100 and scores each standard deviation (SD) up or down are defined as 15 IQ points greater or less, although this was not always so historically. By this definition, approximately two-thirds of the population scores are between IQ 85 and IQ 115. About 2.5 percent of the population scores above 130, and 2.5 percent below 70.

Scores from intelligence tests are estimates of intelligence. Unlike, for example, distance and mass, a concrete measure of intelligence cannot be achieved given the abstract nature of the concept of "intelligence". IQ scores have been shown to be associated with such factors as

morbidity and mortality, parental social status, and, to a substantial degree, biological parental IQ. While the heritability of IQ has been investigated for nearly a century, there is still debate about the significance of heritability estimates and the mechanisms of inheritance.

IQ scores are used for educational placement, assessment of intellectual disability, and evaluating job applicants. Even when students improve their scores on standardized tests, they do not always improve their cognitive abilities, such as memory, attention and speed. In research contexts they have been studied as predictors of job performance, and income. They are also used to study distributions of psychometric intelligence in populations and the correlations between it and other variables. Raw scores on IQ tests for many populations have been rising at an average rate that scales to three IQ points per decade since the early 20th century, a phenomenon called the Flynn effect. Investigation of different patterns of increases in subtest scores can also inform current research on human intelligence.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for what is IQ and its importance](#)

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for IQ and test to measure IQ](#)

EDUCATIONAL IMPLICATIONS OF I.Q

- 1) **Classification or Grouping pupils for school work:** A teacher can use the intelligence tests together with all other information available about the child to place him with others of his ability in smaller groups, the composition of which will vary from subject to subject and from time to time. Students may be classified not according to C.A. but M.A.
- 2) **For diagnosing disabilities in school subjects:** We can compare the score representing in a school subject and the mental age and find the retardation in the subject.
- 3) **For determining the optimum level of work:** The primary aim of education is to assist each child to make the best possible use of all his capacities. It is a general measure of a pupil's capacity to succeed in his school work. The mental age gives the mental level at which a child can be expected to work most efficiently in academic subjects.

- 4) **Identification of intellectual deviations:** It is a problem to find who is bright and who is dull. This is to be found, otherwise a teacher may force adult child to do what is beyond his capacity, or fail to assist the gifted to make use of his exceptionally great capacity. So the extreme cases are to be discovered. The very dull child is likely to be recognised sooner or later as also the gifted. One of the most important problems is giving education coping with mentally defective and identifying and cultivating the potential capacity for leadership which gifted children have.
- 5) **Educational and Vocational guidance:** The fact that intelligence is positively related to vocational competence and to attainments in college work has definite practical implications. The educational or vocational counselor can use the score on the intelligence test along with other data to predict a pupil's success in college or in many vocations. Though vocational success depends upon other factors as well: health, persistence, interest and aptitudes, but intelligence is a potent factor.
- 6) **Estimating the range of abilities in a class:** The teacher can note the range of ability in the class. A group may contain neither very bright, nor very dull. In others the range may be very large. This gives teacher a difficult task in adjusting assignments, methods of instruction. Achievements tests are, therefore, supplemented by intelligence tests to find the range.
- 7) **Determining the level of ability:** In a class or school, the abilities of different teachers can be appraised in terms of the average attainments of their respective classes when these are made equal in the level of intelligence. Similarly comparisons of schools can be made only when the levels of ability of the students of the two schools are also determined.
- 8) **Measuring special abilities:** Aptitude tests can predict the ability to achieve in music, art and various mechanical and social lines.

- 9) **Predicting success in particular Academic Subjects:** Readiness and prognoses tests have been designed to give a high prediction of success in specific subjects, and provide useful basis for the selection of courses. Intelligence tests do not help here much, as there is no fair degree of correlation between various subjects and I.Q.
- 10) **Diagnosing Subject-Matter Difficulties:** At the elementary school level when a child has little choice of subjects, the readiness test is valuable as a diagnosis. It gives the teacher information about the areas in which the child needs more training.
- 11) **Combination of all informatives for Educational Guidance:** The teacher and counselor should get as much information as possible about the pupil. The prognosis test will be very valuable in predicting success in particular subjects, and when combined with intelligence test will be even more effective. The use of achievement test will increase the reliability of the prediction.
- 12) **Research:** Intelligence test results can be pooled and utilised for research purposes.
- 13) **Selection:** In the school children are chosen for various purposes and activities through intelligence tests.
- 14) **Guidance and Organisation of Learning activity.**

THE PSYCHOANALYTIC SCHOOL OF PSYCHOLOGY

Psychoanalysis is a school of psychology founded by Sigmund Freud. This school of thought emphasized the influence of the unconscious mind on behavior.

Freud believed that the human mind was composed of three elements: the id, ego, and superego. The id consists of primal urges while the ego is the component of personality charged with dealing with reality. The superego is the part of the personality that holds all of the ideals and

values we internalize from our parents and culture. Freud believed that the interaction of these three elements was what led to all of the complex human behaviors.

Freud's school of thought was enormously influential, but also generated considerable debate. This controversy existed not only in his time but also in modern discussions of Freud's theories.

Other major psychoanalytic thinkers include:

- Anna Freud
- Carl Jung
- Erik Erikson

The basic postulate of psychoanalysis, the concept of a dynamic unconscious mind, grew out of Freud's observation that the physical symptoms of hysterical patients tended to disappear after apparently forgotten material was made conscious. He saw the unconscious as an area of great psychic activity, which influenced personality and behavior but operated with material not subject to recall through normal mental processes. Freud postulated that there were a number of defense mechanisms—including repression, reaction-formation, regression, displacement, and rationalization—that protect the conscious mind from those aspects of reality it may find difficult to accept. The major defense mechanism is repression, which induced a "forgetfulness" for harsh realities. Observing the relationship between psychoneurosis and repressed memories, Freud made conscious recognition of these forgotten experiences the foundation of psychoanalytic therapy. Hypnosis was the earliest method used to probe the unconscious, but due to its limited effectiveness, it was soon discarded in favor of free association. Dreams, which Freud interpreted as symbolic wish fulfillments, were considered a primary key to the unconscious, and their analysis was an important part of Freudian therapy.

To clarify the operation of the human psyche, Freud and his followers introduced a vast body of psychoanalytic theory. In considering the human personality as a whole, Freud divided it into three functional parts: id, ego, and superego. He saw the id as the deepest level of the unconscious, dominated by the pleasure principle, with its object the immediate gratification of instinctual drives. The superego, originating in the child through an identification with parents,

and in response to social pressures, functions as an internal censor to repress the urges of the id. The ego, on the other hand, is seen as a part of the id modified by contact with the external world. It is a mental agent mediating among three contending forces: the outside demands of social pressure or reality, libidinal demands for immediate satisfaction arising from the id, and the moral demands of the superego. Although considered only partly conscious, the ego constitutes the major part of what is commonly referred to as consciousness. Freud asserted that conflicts between these often-opposing components of the human mind are crucial factors in the development of neurosis.

Psychoanalysis focused on early childhood, postulating that many of the conflicts which arise in the human mind develop in the first years of a person's life. Freud demonstrated this in his theory of psychosexuality, in which the libido (sexual energy) of the infant progressively seeks outlet through different body zones (oral, anal, phallic, and genital) during the first five to six years of life.

GESTALT SCHOOL OF PSYCHOLOGY

Gestalt psychology is a school of thought that looks at the human mind and behavior as a whole. When trying to make sense of the world around us, Gestalt psychology suggests that we do not simply focus on every small component.

Instead, our minds tend to perceive objects as part of a greater whole and as elements of more complex systems. This school of psychology played a major role in the modern development of the study of human sensation and perception.

Originating in the work of Max Wertheimer, Gestalt psychology formed partially as a response to the structuralism of Wilhelm Wundt.

While Wundt was interested in breaking down psychological matters into their smallest possible part, the Gestalt psychologists were instead interested in looking at the totality of the mind and behavior. The guiding principle behind the Gestalt movement was that the whole was greater than the sum of its parts.

The development of Gestalt psychology was influenced in part by Wertheimer's observations one day at a train station. He purchased a toy stroboscope which displayed pictures in a rapid

sequence to mimic the appearing movement. He later proposed the concept of the Phi phenomenon in which flashing lights in sequence can lead to what is known as apparent motion.

In other words, we perceive movement where there is none. Movies are one example of apparent motion. Through a sequence of still frames, the illusion of movement is created.

"The fundamental 'formula' of Gestalt theory might be expressed in this way," Max Wertheimer wrote. "There are wholes, the behavior of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the whole. It is the hope of Gestalt theory to determine the nature of such wholes."

What is the Gestalt Theory?

Gestalt is a decisive trend in psychology history. It was born in Germany at the beginning of the 20th century. It was Christian von Ehrenfels, an Austrian philosopher, who gave this movement its name in *The Attributes of Form*, his most important work. There is no perfect English translation of the term "gestalt".

But we can interpret it as "totality", "figure", "structure", "configuration" or "organized unity".

"The whole is more than the sum of its parts" is its maximum. The main authors of Gestalt proposed alternatives to the dominant psychological paradigms and made great contributions to cognitive psychology.

This particular focus was a breath of fresh air and allowed people who did not feel represented by the main currents of psychology to find an alternative.

Gestalt Theory: Characteristics

Its main predecessors of gestalt theory are philosophers: Thinkers such as Kant, Descartes or Husserl developed the theoretic basis on which this school developed. The psychologists belonging to this current were able to take their ideas to the laboratory and obtain amazing results.

We must treat people as a whole: We cannot explore the different dimensions that shape us in isolation. A holistic approach is needed when speaking about mental health. The complexity of

the human mind cannot be reduced. Gestalt theory explores the dynamic relationships that connect the various elements of reality. Gestalt theory does not conceive separating processes such as learning from memory.

We are active in understanding reality: We do not all perceive reality, in the same way, we have our own vision. Each one structures the information they receive according to their previous experiences. Our mental representations do not correspond completely with those that exist in reality, we construct them ourselves. We are also able to adapt our mental processes and contents as new situations arise.

They opposed the predominant schools in their time: Gestalt theory psychologists did not agree with approaches such as behaviorism, which limits human behavior to associations between stigmas and responses. This perspective leaves mental processes aside and does not contemplate the potential of human intelligence. On the other hand, they did not adhere to psychoanalysts either, seeing people as passive agents without willpower.

Gestalt theory's main study area is perception: Gestalt theorist focused especially on seeking simple and natural explanations that could be adapted to our natural way of perceiving reality. Through perception, we are able to acquire knowledge of the world, interact with it and connect with others.

Our senses and mental processes interact to allow us to perform tasks as varied as removing the hand from a burning surface or notice that the person speaking to us is upset by their frowning. Gestalt theory focuses on visual perception. However, their ideas have been adapted to fields such as music.

Gestalt Theory: Main contributions

Gestalt psychologists are known for their contributions to the study of the learning process and problem-solving. However, their most relevant contribution, which was stated by Wertheimer, is the elaboration of some basic laws that govern our perception.

Gestalt Theory Laws

We can see a host of examples of these principles around us. In addition, they are fully applicable to our daily life.

- a) **Law of Prägnanz** : Perception tends to organize the elements in the simplest possible way. Our brain prefers harmonious compositions. Mental processes are not infinite, we cannot dedicate time and resources to everything around us. Therefore, we simplify what we perceive and prefer simplicity. In this picture, we don't need any more data to know that we are looking at a cup.
- b) **Figure-ground law** : We have all seen Rubin's glass at one time or another, it is the best-known example of this phenomenon. We will have realized that it is impossible to perceive the faces and the cup at the same time.
- c) **Law of proximity** : The elements closest to each other tend to form a group as if they were one set. If you look at three piles of candy, you'll notice three groups instead of seeing all the candy separately. In this example, we perceive the objects in each box as a single block.
- d) **Law of similarity**: Similar figures seem to have the same shape. Their similarity may be due to the fact that they have a similar color, shape or any other characteristic that allows us to draw a parallel between them. We know that each tree has its own characteristics; not all trees have exactly the same height and color. However, from this point of view, they seem to us to be practically the same because of their similarity.
- e) **Common Fate law** : Elements that seem to move together towards a certain orientation are perceived as a whole. If we see some children running to an ice cream stand, we will look at them as a whole. However, we can also look at them one by one if we are interested. In this case, we perceive the group in a homogeneous way.
- f) **Law of Closure**: We tend to mentally close the contours to simplify reality. If we see a slightly curved curve that is practically closed, we will notice a circumference. It is also possible to apply this law to verbal messages. For example, advertisers release suggestive

phrases for their audience to complete. This technique requires a little effort on the part of the public to be effective. However, it maintains its interest and can achieve greater involvement. This photograph leads us to imagine a closed line that unites all people. We see that they are separate, but our brain reduces the information.

- g) **Law of Good Continuity** : We prefer to ignore the abrupt changes in an image we are seeing. Generally speaking, we pay more attention to the characteristics of a stimulus that allow us to perceive a smooth continuity. One example is that if we are walking around and notice on a poster an A covered in half by a street lamp, we will continue to know that the letter is A and read the text without difficulties. In this example, we can see the continuity of the branches.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Gestalt principles](#)

Spearman's Two factor theory of Intelligence

The early 1900s saw Charles Spearman using a mathematical approach to the question of measuring human intelligence. Using statistical factor analysis Spearman identified g, a single underlying intelligence factor he believed accounted for the variety of observable abilities.

Spearman noticed that children's grades across all school subjects tended to be highly correlated. If a child did well in one subject, they generally also did well in another subject, and vice versa. What did this say about the nature of intelligence?

He devised factor analysis to measure the relationships between seemingly varied cognitive abilities and account for the correlations he saw between scores on different tests.

The result was Spearman's two-factor theory which attempted to show that all cognitive performance can be explained by two variables: one general ability (g) and the many specific abilities (s) it gave rise to. Later, however, further analysis showed that g alone was enough to explain the correlations between different tests. When people talk about IQ or intelligence, it's usually this general mental ability that they are referring to.

Stanford-Binet test, which measures different areas of performance that contribute to general intelligence, like working memory and visual-spatial reasoning.

Today intelligence is usually understood as a hierarchy: smaller factors manifest in the ability to do highly specific tasks, but those factors can be arranged into broader intermediary categories which in turn are encompassed within the most general factor, g.

Thurstone's Group factor theory

Thurstone's theory: Primary mental abilities/Group factor theory: States that Intelligent Activities are not an expression of innumerable highly specific factors, as Thorndike claimed. Nor is it the expression primarily of a general factor that pervades all mental activities. It is the essence of intelligence, as Spearman held. Instead, the analysis and interpretation of Spearman and others led them to the conclusion that 'certain' mental operations have in common a 'primary' factor that gives them psychological and functional unity and that differentiates them from other mental operations. These mental operations then constitute a group. A second group of mental operation has its own unifying primary factor, and so on. In other words, there are a number of groups of mental abilities, each of which has its own primary factor, giving the group a functional unity and cohesiveness.

Each of these primary factors is said to be relatively independent of the others. Thurstone has given the following six primary factors :

- a) The Number Factor (N)—Ability to do Numerical Calculations rapidly and accurately.
- b) The Verbal Factor (V)-Found in tests involving Verbal Comprehension.
- c) The Space Factor (S)-Involved in any task in which the subject manipulates the imaginary object in space.
- d) Memory (M)-Involving ability to memorize quickly.
- e) The Word Fluency Factor (W)-Involved whenever the subject is asked to think of isolated words at a rapid rate.
- f) The Reasoning Factor (R)-Found in tasks that require a subject to discover a rule or principle involved in a series or groups of letters.

Based on these factors Thurstone constructed a new test of intelligence known as “Test of Primary Mental Abilities (PMA).”

Thorndike's Multifactor Theory

E.L.Thorndike opposed Sternberg’s theory of general intelligence and propagated the multifactor theory or the atomistic theory of intelligence. According to his multifactor theory of intelligence, he proposed that individual’s intelligence is a combination of numerous separate elements or factors, each one being a minute element of one’s ability.

Thorndike has stated in his famous book on educational psychology that the mind is a host of highly particularized and independent faculties. Intelligence, according to him,is the sum total of various such smaller independent faculties and each faculty is related to some kind of cognitive functions and intelligence as we measure and describe, is a synthesis of all such smaller abilities.

Further he states that a mental act involves a number of these minute elements operating together. If any two tasks are correlated, the degree of correlation is due to the common elements involved in the two tasks.

As regards the inter-correlations between different factors of intelligence, Thorndike assumes that this correlation owes mainly to commonalities of abilities.

Thorndike was an Associationist and he opposed the theory of General intelligence. He proposed that they are Specific stimuli and Specific response. According to him, Intelligence is nothing more than a convenient name for almost infinite number of actual or potential specific connections between these stimuli and responses.

According to the theory intelligence is said to be constituted of multitude of separate factors or elements each being a minute element or ability. A mental act involves a a number of these minute elements operating together. If any two tasks are correlated, the degree of correlation is due to the common elements involved in the two tasks.

Thorndike distinguished 4 attributes of intelligence. They are:

- Level
- Range

- Area
- Speed

- Level: This refers to the difficulty of a task that can be solved. If we think of all test items arranged in a sequential order of increasing difficulty, then the height that we can ascend on this ladder of difficulty determines our level of intelligence.

- Range: This refers to the number of tasks at any given degree of difficulty that we can solve. Theoretically an individual possessing a given level of intelligence should be able to solve the whole range of task at that level. Range is determined not only by Level but also by the Breadth of experience and by opportunity to learn. In intelligence tests range is represented by items of equal difficulty.

- Area: It refers to the total number of situations at each level to which the individual is able to respond. Area is the summation of all the ranges at each level of intelligence processed by an individual.

- Speed: This is the rapidity with which an individual can respond to items. Speed and altitude are positively related. Speed is much closely bound up with altitude than are the other attributes. We should not therefore emphasis speed too much in our intelligence test.

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Guilford structure of intellect

Guilford and his associates proposed the theory of Structure of Intellects on their attempt of factor analysis.

Guilford suggests that mind is composed of 3 major dimensions namely:

- Process of operation
- Material or content

➤ Product

Process of operations:

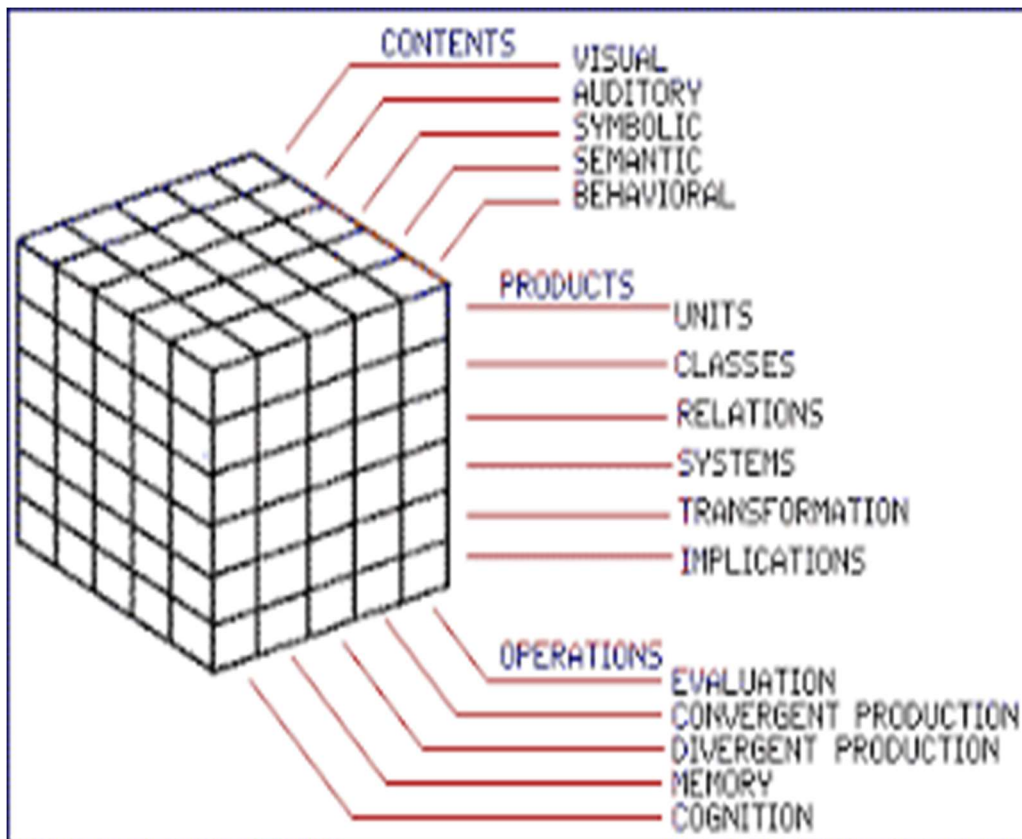
1. **Cognition:** This involves immediate discovery, rediscovery, awareness, comprehension and understanding.
2. **Memory recording:** It is a fundamental operation. It refers to the retention of what is recognised for a short duration.
3. **Memory retention:** It means the retention of what is recognised for a long period of time.
4. **Divergent thinking:** It refers to the generation of information from the given data where the emphasis is on conventionally accepted best outcomes.
5. **Convergent thinking:** It involves thinking in different directions, searching and seeking some different variety and novelty. It is closely related with creativity. It simply means thinking out of the box.
6. **Evaluation:** It refers to the reaching of conclusion and decision as the goodness, correctness, adequacy and desirability of information.

A. Material or Contents:

1. **Visual content:** It refers to the concrete material perceived through ideas and thoughts.
2. **Auditory content:** It refers to the matter or information perceived through ears.
3. **Symbolic content:** It refers to the composition of letters, digits or other conventional signs and symbols usually organised in general patterns.
4. **Semantic content:** It refers to the clear verbal form of meanings or ideas for which no examples are necessary.
5. **Behavioural content:** It refers to the social intelligence which enables one to understand human communications.

B. Products:

1. **Units:** This is similar to Gestalt psychology of figure and ground; relatively segregated items.
2. **Classes:** It refers to conceptions underlying sets of information or data grouped by virtue of their common properties.
3. **Relations:** It refers to the connections between items of information based on variables. These connections are more meaningful and definable.
4. **Systems:** It refers to the aggregate of items of information or data with a structure.
5. **Transformations:** It refers to the changes like redefinition, modification in existing information or its functions.
6. **Implications:** It refers to the explorations of information in the form of expectancies, predictions and consequences.



Thus according to Guilford there can be only 180 mental abilities that comes as a result of six processes operating on any one of the 5 contents to produce anyone of the 6 products.

Thus $6 \times 5 \times 6 = 180$ mental abilities.

Guilford neglects the idea of some fixed amount of intelligence. Instead, he claims that development of intellectual skill as in any other skill depends on practice. Unlike others, he is concerned with the social behaviour of the individual besides academic success. Therefore, he devised some test of social sensibility. He considers Interpersonal skills. He refers to the dynamic cluster of skills which can always be improved.

[Click on the link to open the hyperlink by right click of your mouse to watch the Video for Guilford structure of intellect](#)

SELF ASSESSMENT

1) Critically compare Spearman's theory of 'g' with alternative theories of intelligence.

ANSWER: Since Spearman first suggested a general factor of intelligence (g) in 1904, many theorists have developed their own ideas about the nature of intelligence. Some agree on the existence of general intelligence, albeit the nature of g is hotly debated, and some disagree completely with the notion of g. The main theories to consider after Spearman's are multifactor theories and hierarchical theories. These are presently discussed along with some alternative theories, and the idea of a general factor of intelligence is explored.

Spearman (1904) used factor analysis on data from school children and found a positive correlation between their results in different tests of mental abilities. Following this finding, between 1904 and 1921 he used factor analysis on data from a variety of intelligence tests and found similar positive correlations (Maltby, Day & Macaskill, 2010). Spearman argued that this evidence suggests there is an overall g measured by these IQ tests. He described g as a kind of mental energy each individual possesses and believed it resulted in our specific abilities and skills (Maltby, et al.). If g was the only influence on intelligence the positive correlations would be perfect, which he noted was not the case. To explain this, Spearman suggested that each individual test has a specific ability (s) that is tapped, so performance on an arithmetic subtest, for example, depends partly on g and partly on numerical skills (s) specific to the test (Gleitman, 1995). It was argued by Thomson (1916) that Spearman's two-factor model is not the only way to account for the intercorrelational patterns observed in the data and that a theory comprising of many group factors could adequately replace Spearman's g in explaining the correlations. This argument has been revisited recently by Bartholomew, Deary and Lawn

(2009) who concluded that the apparent good fit of a model may not be sufficient to explain the workings of the brain during IQ tests. Despite apparent floors in Spearman's model, the notion of *g* has influenced many theorists since it was first proposed, with several theories having been developed in the wake of Spearman's work.

Multifactor theorists argue that there is more than one factor of intelligence to account for. They point out that many individuals display great skill and ability in one area, but poor ability in another (Sternberg & Kaufman, 1998). The first major theory after Spearman's pioneering work came from Thurstone, who saw Spearman's (1904) theory as limited by the idea that all variables had only one factor in common, *g* (Thurstone, 1934). Thurstone suggested that intelligence resulted from seven primary mental abilities, rather than these abilities resulting from *g* as Spearman suggested. The mental abilities proposed by Thurstone are; verbal comprehension, word fluency, number facility, spatial visualization, associative memory, perceptual speed and reasoning (Maltby, et al., 2010) and they are described by Thurstone (1924) as the primary abilities required for an individual to survive and thrive in one's environment. Cattell (1971), however, agreed with Spearman that *g* existed but took the notion a step further. He disagreed with Thurstone's model and pointed out the intercorrelation between the factors said to represent Thurstone's primary abilities. According to Cattell, these intercorrelations suggest the existence of an overall general factor. Unlike Spearman's theory of *g*, Cattell's model suggested that *g* was made up of two components; crystallised intelligence (*Gc*) and fluid intelligence (*Gf*). *Gc*, refers to acquired knowledge and skills learned over the lifespan, whereas *Gf* refers to primary reasoning ability which is innate and which matures into adulthood. These two components are said to be distinct intelligences, but dynamically linked (Maltby, et al.). Humphreys (1967), however, does not believe Cattell's model adequately explains intelligence and he points to methodological floors in Cattell's study, for example, in the selection of variables. Humphreys also shows intercorrelations that fit Cattell's model that fail to distinguish it from Vernon's hierarchical model.

Similar to Thurstone (1934), Guilford developed a model of intelligence that disagreed with Spearman's *g*. He proposed the Structure of Intellect (SI) theory, which rejects the concept of *g* (Maltby, et al., 2010). SI states that there are three categories of intelligence, rather than one;

operations, contents and products. There are five operations which are types of mental processing; evaluation, convergent production, divergent production, memory and cognition. There are five components which make up the mental material we possess on which operations are performed; visual, auditory, symbolic, semantic and behavioural. There are six products which consist of the form in which information is stored, processed and used; units, classes, relations, systems, transformations and implication. Each of these different elementary abilities from the three groups can combine in different ways to form the 150 abilities proposed by Guilford. For example, to remember a dog we would use the visual content and the unit product (Maltby, et al.). There has however been little support for Guilford's theory (Maltby, et al.).

Hierarchical theorists use the idea of Spearman's g but suggest g branches into more specific abilities (Maltby, et al., 2010). Both Vernon and Carroll suggest multiple levels of intelligence with group factors involved. The highest level in Vernon's theory is g , which branches into two major group factors; verbal/education ($v:ed$) and spatial/mechanical ($k:m$) abilities. The next level contains minor group factors; verbal, numerical and educational abilities which stem from $v:ed$, and practical, mechanical, spatial and physical abilities which stem from $k:m$. These minor groups then branch into specific factors. A typical branch might go; g $v:ed$ educational abilities reading/spelling/use of grammar, for example (Maltby, et al.). Carroll based his work on 460 data sets obtained between 1927 and 1987 (Sternberg & Kaufman, 1998), describing intelligence using three hierarchical levels, termed strata. Stratum I consists of 69 specific levels of intelligence, for example, spelling ability. Stratum II consists of eight group factors that branch from Stratum I. These are fluid, crystallised, memory and learning, visual, auditory, retrieval, cognitive speed and processing speed. Stratum III represents a single general level of intelligence, similar to Spearman's g (Sternberg & Kaufman). Carroll's theory incorporates Spearman's g , specific factors, Cattell's G_c and G_f , Thurstone's group factors and Vernon's hierarchical approach (Maltby, et al.).

Gardner's multiple intelligences theory challenges Spearman's g by suggesting there are 9 completely distinct intelligences (Maltby, et al., 2010). He did not see intelligence as a learning mechanism or a way of working, but rather as a computer that works more or less well. According to Gardner's multiple intelligence theory, each intelligence resides in

separate parts of the brain but can interact and work together when needed (Maltby, et al.). Gardner argues that the variety of different abilities and skill that humans display cannot be explained by g as measured by IQ tests (Visser, Ashton & Vernon, 2006). Evidence for this approach comes from studies of brain lesions, which may affect some abilities but not others (Gleitman, 1995). Savantism had also been used as evidence for multiple intelligences but this has now been refuted (Heaton & Wallace, 2004). Savants are persons who have one or more exceptional abilities that are unusual for their low level of general intelligence, however, the incidence of savantism is much lower than should be expected if intelligences are as independent as Gardner suggests (Gleitman) and it is now suggested that savantism reflects localised knowledge, rather than any form of intelligence (Heaton & Wallace).

Sternberg took a more cognitive approach than previous theorists in his Triarchic theory and identified three fundamental aspects of intelligence (Sternberg, 1985). These are in the form of three different sub-theories. The componential sub-theory refers to the mental processes through which intelligent behaviour is expressed. The contextual sub-theory describes how the mental processes adapt to, select and shape the environment to carry out actions. The experiential sub-theory describes how experience relates to intelligence in order to obtain new information (Maltby, et al., 2010).

2) Discuss the educational implications for Lewin's field theory.

ANSWER: Following are the major educational implications of this theory:

- a) **Reward and Punishment:** According to Lewin, the learner because of attraction to rewards may resort to shortest methods. For example, to get distinction in the examination (reward) the student may like to cheat (shortcut method). It is, therefore, necessary to put some barriers over the reward situation, to avoid access to such short methods. In the case of punishment, however, there is a tendency to leave the field because of the unpleasantness of the task, unless some strong barriers are there to keep one in the field. Reward activities often become interesting and are liked so that motivation is no longer extrinsic while the activities controlled by the threat of punishment tend to become extremely hated.

b) Success and Failure: Psychological analysis of success from the point of view of the learner shows the following possibilities:

- To reach a goal constitutes success.
- To get within the region of the goal may be a success experience.
- To make some progress in the direction of the goal also constitutes a success experience.
- To select a socially approved goal is also a success experience.

Psychological success or failure depends upon ego involvement and the level of aspiration. Success in easy task is not a success experience, since it does not involve the ego of the person. Similarly, failure in a very difficult task is no failure experience.

c) Motivation: The repetition of an activity brings change both in the cognitive structure and in the need-tension systems. As a result of this goal, attractiveness changes. Lewin calls goal attractiveness valence and valence change. The valence may change in any of the following ways:

- Attractive goals may lose attention if the activity related to them is repeated to the points of satiation.
- Choice of goals is influenced by previous experiences of success and failure.

d) Memory: The field theory states the following regarding memory:

- Tasks which have no sense in completion are not remembered.
- Unfinished tasks are remembered better than finished tasks because of psychological tension.
- Tasks which lead to the satisfaction of many needs are remembered better than tasks which lead to the satisfaction of one need.

3) “The concept of intelligence used in Emotional Quotient (EQ) is much broader than the concept of Intelligence Quotient (IQ)”. Analyse the statement in reference to their application in modern-day administration. (150 words)

ANSWER: Intelligence Quotient (IQ) is a measure of a person's cognitive abilities allowing one to acquire knowledge, learn and solve problems while Emotional Quotient (EQ) measures one's ability to monitor emotions, cope with pressures and demands and control one's thoughts and actions. The difference in the concept of intelligence in Emotional Quotient (EQ) and

Intelligence Quotient (IQ)-IQ measures concepts like logical reasoning, word knowledge and math skills, while EQ measures creative abilities or emotional abilities.

It is not necessary that a high IQ person can easily make social bonds or relations but a person with a high EQ is adept at maintaining relationships or building social bonds. Intelligence level or IQ of a person may never change but EQ can be increased through practising self awareness, self-confidence and self-restraint of emotions. Thus, Emotional Quotient is broader than just gauging one's intellect based on knowledge and aptitude in solving complex problems and includes qualities of being self aware, managing emotions, having self-motivation, recognizing emotions of others and handling relationships.

Application in modern-day administration

While both are sine qua non for modern day administrators due need of a complex set of skills in solving problems, ability to analyse data, patterns, wider knowledge etc. to work efficiently and competitively, but it is strong Emotional Quotient (EQ) that adds to quality life and stable mind in face of constant disruptive instances like change in work culture, manage personal life, remain motivated in constant failures.

EQ helps in modern day administration in many ways which IQ alone cannot ensure. An administrator of high EQ is capable of:

- Using emotions in addition to cognitive abilities to function rather than relying solely on logic.
- Appealing to emotions to convince someone rather than using facts alone.
- Knowing how to motivate separate individuals as opposed to treating everyone the same way.
- Knowing how and why rather than just Knowing what
- Good interpersonal skills and less prone to aggression
- Increased level of commitment, trustworthiness, and conscientiousness.
- Ability to bounce back from setbacks and become change catalyst
- Using better communication of thoughts
- Inculcating enhanced leadership traits.
- Appreciating diversity and performing multiple tasks with focus.

Conclusion

Building social bonds- physical and mental relationships, conflict resolution, High moral standards and leadership qualities are essential for modern day administrators for effecting good and ethical governance. Higher intellect (IQ) alone cannot guarantee such, hence there is need for a high emotional quotient (EQ) also.

4) Discuss the educational implications for Gestalt theory of learning.

ANSWER: Educational implications of Gestalt theory of learning:

- a) Learning purposeful & goal oriented.
- b) Motivation to the learner
- c) Acquaint with specific aims & purposes of the learning.
Example: To learn or memorize a poem, present as a whole. After being read & understood as a whole, break into parts or stanzas as for effective memorized.
- e) Organization of a perceptual fields & learning material as a whole.
Learning cannot be related to subject or skill. It should be collection of isolated facts, informations or unrelated behaviuoral acts. Contributes in organization of curriculum, scheme of studies, work plan & procedure of planning the schedule of learning or teaching of a skill or a behavior.
- f) Distinction between a psychological & a logical order of presentation.
Example: to teach matter we have to proceed as subelectronic particles electrons, atoms molecules and matter.
Example: in geography: map of the world an orange and the relation of sun & earth.
- g) Problem solving attitude develops
- h) Encourages reasoning, develops thinking & trains imagination & creative activity

5) How does classical conditioning affect learning?

ANSWER: Edward Thorndike (1898) is famous in psychology for his work on learning theory that led to the development of operant conditioning within behaviorism. Whereas classical conditioning depends on developing associations between events, operant conditioning involves learning from the consequences of our behavior. Skinner wasn't the first psychologist to study learning by consequences. Indeed, Skinner's theory of operant conditioning is built on the ideas of Edward Thorndike. Thorndike studied learning in animals (usually cats). He devised a classic experiment in which he used a puzzle box (see fig. 1) to empirically test the laws of learning.

He placed a cat in the puzzle box, which was encouraged to escape to reach a scrap of fish placed outside. Thorndike would put a cat into the box and time how long it took to escape. The cats experimented with different ways to escape the puzzle box and reach the fish. Eventually they would stumble upon the lever which opened the cage. When it had escaped it was put in again, and once more the time it took to escape was noted. In successive trials the cats would learn that pressing the lever would have favorable consequences and they would adopt this behavior, becoming increasingly quick at pressing the lever. Edward Thorndike put forward a "Law of effect" which stated that any behavior that is followed by pleasant consequences is likely to be repeated, and any behavior followed by unpleasant consequences is likely to be stopped.

Critical Evaluation

Thorndike (1905) introduced the concept of reinforcement and was the first to apply psychological principles to the area of learning. His research led to many theories and laws of learning, such as operant conditioning. Skinner (1938), like Thorndike, put animals in boxes and observed them to see what they were able to learn. The learning theories of Thorndike and Pavlov were later synthesized by Hull (1935). Thorndike's research drove comparative psychology for fifty years, and influenced countless psychologists over that period of time, and even still today.

MULTIPLE CHOICE QUESTIONS

1) Why did Terman adapt the Simon-Binet IQ test in 1916?

- a. Because the Simon-Binet test did not measure actual intelligence.
- b. Because the Simon-Binet test did not work effectively cross-culturally.
- c. Because the Simon-Binet test was outdated.
- d. Because the Simon-Binet test was racist.

ANSWER: b

2) What do the initials IQ stand for?

- a. Intelligence quotient.
- b. Investment in education quotient.
- c. Intelligence question.
- d. Intellect quotient.

ANSWER: b

3) According to Spearman, what does 'g' stand for?

- a. Green's intelligence criteria.
- b. Group intelligence.
- c. General knowledge.
- d. General intelligence.

ANSWER: d

4) Which of the following is not a subtest used by Wechsler to measure intelligence?

- a. Object assembly.
- b. Visual discourse.
- c. Digit symbol.
- d. Comprehension.

ANSWER: b

5) According to Thurstone, how many primary mental abilities are there?

- a. 3
- b. 11
- c. 9
- d. 7

ANSWER: 7

6) In Sternberg's triarchic theory of intelligence, the experiential subtheory refers to:

- a. metacomponents, performance components and knowledge-acquisition components.
- b. how experience interacts with intelligence in terms of the individual's internal world, and the external world.
- c. internal mechanisms that underlie intelligent behaviour.
- d. cognitive self-motivation and organisation skills.

ANSWER:b

7) Which one of the following is NOT a form of intelligence, according to Gardner (1983)?

- a) Spatial.
- b) The visual-auditory dimension.
- c) Bodily kinesthetic.
- d) Interpersonal.

ANSWER: b

8) Which of these is NOT an element of the Alpha intelligence test developed by Yerkes?

- a. Practical judgment.
- b. Oral directions.
- c. Pronunciation

- d. Arithmetic problems.

ANSWER: c

9) Which concept did William Stern develop?

- a. The emotional quotient.
- b. The intelligence quotient.
- c. The emotional intelligence test.
- d. The intelligence test.

ANSWER: b

10) Which are the main components of Spearman's two factor theory of intelligence?

- a. Visual ability and spatial ability.
- b. Primary abilities and secondary abilities.
- c. Specific intelligence and general intelligence.
- d. Emotional abilities and cognitive abilities.

ANSWER: c

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