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Department of Psychology

Experiment / Test No. : 1

Date : 16/1/2019

Title of the Experiment / Test : Concept Formation

Subject's Name : N.H

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Class : M A (I) Roll No. : 1865120

Signature of the Teacher

CONCEPT FORMATION

- STATEMENT OF THE PROBLM :-

To study processes used in concept formation.

- INTRODUCTION:-

1) Define concepts and describe nature of concept:-

Concepts refers to the formation of some abstract idea or thought in the mind. It is a general abstract idea of something formed mentally, combining all specific parts and characteristic features.

A concept is an abstract idea or abstraction formed by generalizing from many experiences with particular things and events. Concepts are mainly reffering to categories for classifying specific objects, persons, animals and events on the basis of certain common elements or qualities.

A group of objects or persons of the same type having the same qualities may be categorised under one head and a name may be assigned to them. This we call as a concept. This concept is symbollicaly standing for a group of objects or persons. Therefore, a concept also is symbol

Gardner Murphy (1964) states that a concept is a symbol which stands for a specific quality passessed in common by a number of stimuli

According to Moskowitz and Orgel (1969) concept is a response of a reaction made to some quality or attribute of a situation instead of to to the whole situation and the same can be

generalised or attributed to a new and different situation having the same quality or attribute. According to them concept can be developed by repeated experience in human learning situation.

When a person learns to respond to certain common qualities specific to a group of objects and learns to ignore the objects passessing other, a different type of qualities, he is said to have learned a concept.

For example, animal, it is a concept, a general concept. The description is that all those creatures which are having four legs and a tail are called animals. Dog is a concept, specifically refering to a particular kind of animal. House, automobile and chart are all simple concepts. Belief, faith are abstract concepts. Shorter, longer, smoother are concepts based upon common relations.

2) Types of concepts:-

In the concept attainment it is important to decide whether a concept is conjunctive or disjunctive type or abstract or concrete type. Thus there are 8 types of concepts.

A) conjunctive and disjunctive type:-

Conjunctive concepts are those concepts that have two or more attributes or qualities in them. Conjunctive concept refers to the characteristic possessed by persons, animals, birds, objects and events in common which can bring together under one class or category. For example, a conjunctive concept such as 'Cow' supposed to posses all

the attributes. First of all the it is an animal, polite animal, having all the physical characteristics like four legs, one tail, two horns and gives birth to a calf and yields milk. It is a mammal animal. The cow has clear cut distinction from other animals and no animal can duplicate it. Any animal which is lacking any of these attributes is not called cow. Similarly the concept of dog may be classified as conjunctive concept. Just like the cow, the dog has clear cut attributes to be called as 'dog'. Though their may be several varities of cows and dogs they all have the same characteristics.

Disjunctive concepts are those concepts that have one of these features or the other features or all the features put together may bringe into a category or may qualify the concepts to be called as disjunctive concepts. For example, in cricket game a man who is batting is said to be 'out'. The umpire decides how the batsman is out? It can be cricket out or catch out or run out or stump out. Either one of these attributes would justify the umpire in classifying this event as an 'out'. Similarly you may call person by using the concept as your 'uncle'. The attribute here is not clear cut and just like father's brother or your mother's brother. Or your aunt's husband or your mother's sister's husband. Anyone of these relationships qualifies him to be called as Uncle. Out of several attributes one of them is correct. There are more complicated types of concepts for which there are other rules for defining them.

B) Relative Concept:-

Relative concept is defined by the relationship between the features of an object or between an object and its surroundigs. This means that rational concepts are based on how an object relates to something else or how its features relate to one another.

C) Basic Concept:-

Basic concept is universal.

D) Learned Concept:-

Learned concepts are not universal. We make them and give meaning to them.

3) Stages of Concept Formation:-

Concept formation takes place from the childhood period throughout the life experiences of human persons. The nature of concept formation varies according to age and experience. When a symbol stands for a class or a particular category of objects or events with certain common to series of objects. It mainly refers to the description of the common elements. It differentiates the quality of one object from another; for example, the child gradually learns to comprehend persons, objects and events. He sees a pencil and understand that it is pencil and it is used for the purpose of writing. He could differentiate a pencil from an ordinary piece of stick or found ~~dalaa~~ pen

A) Generalization :-

The term generalization appears to be simple. But it is very difficult to define, that can be accepted by all. We can illustrate it through a simple defination. Generalization in concept formation may be defined as the process of detection by the person of principle or characteristic common to a class of objects, events or problems. It is widely inclusive of relationship among the object or events or problems. It is widely inclusive of relationship among the object or events. Therefore, all the principles or laws of great part of all these that are taught and learnt are generalization. Because they mainly express relationships which is based upon generalizations. For example, in geometry, it is often stated that the square of the hypotenuse is equal to the sum of the squares of the other two sides, is generalization about a right angle triangle.

B) Abstraction :-

The child mostly learns the concept by seeing and by asking questions. Sometimes we teach concepts to a child. For example, a cow is introduced to the child. The cow can be assigned to the general concept as animal or mammalian. Cow is a animal, it has four legs, a tail just like other animals and also it has two horns. Secondly, the concept, 'cow' helps us to differentiate it from other animals because it is specifically stated as 'cow' among the general species the

animals. From the personal experience, reading and from other sources the child may understan that most of the cows are harmless animals. Therefore; the reaction to a cow on seeing is not with any fear or alarm that human beings normally react to an elephant or tiger on seeing it.

Thirdly, the concept cow may be used for abstracting without making mention to any specific animals. In this way the cow has been discriminated from other animals that have certain common features with the cow. This is called abstraction. Abstraction is the process of isolating certain characteristics of the same class of objects and disregarding all other characteristics of the same object at the moment. In the case of the cow we are isolating it from other animals that it is soft and quiet and it supplies milk. This cow is discriminated from also other cow like animals, for example, a bull or the cow not supplying milk.

4) Rules Involved In Concept Formation:-

Haygood and Bousne (1965) employed different rules. The 5 successive problem presented to any given subject, however always involved the same rule and the same set of instructions set represent one of the relevant attributes as R (eg. Red) and other as S (eg. Square). The 4 rules employed are as follows:-

1) Rule 1:- Conjunction

All stimulus events that are both R and S

ii) Rule 2:- Disjunction.

All stimulus events that are neither S or R.

iii) Rule 3:- Joint Denial.

All stimulus events that are neither R or S.

iv) Rule 4:- Conditional.

If a stimulus event is R, then it must also be S. But if it is not R then it is also a positive instance.

There is an improvement in performance across successive problems. This is clearly seen in all rules of learning. Improvement from the begining. In all instructional conditions, particular on the intial problems, the rules differ in difficulty. The conjunctive rule the easiest, with disjunctive and joint denial rules being more difficult. But showing considerable improvement over problems. Some researchers have shown that the effect of irelevant dimensions is to increase the difficulty of attribute identification but rule learning is vitually unaffected.

5) Process Involved In Concept Formation:-

A) Inductive:-

Inductive is a process by which we reach up to universal conclusion from particular observations or in other words, inductive is a process of reasoning whereby we arrive at universal generalizations from particular fact. Inductive gives rise to empirical generalizations and is opposite to deductive. Inductive involves a passage from observed to unobserved. Inductive involves 2 processes observation and generalization. If, in

a number of cases, it is observed that educated girls have get expensive habits, one may conclude that all educated girls have got expensive habits. This is the simplest kind of inductive and is called inductive by enumeration. But scientific inductive is based on known casual connection. Inductive by enumeration gives us only probable conclusion, but scientific inductive gives us certain conclusion.

A perfect inductive is the process of establishing a universal proposition by an exhaustive enumeration of all the instances of the type covered by the universal proposition. Perfect inductive is not opposite to deductive but on the other hand, it is an example of deductive.

Demerits of Inductive:

1. It is a time-consuming, expensive and complicated method.
2. It often leads to hurried and wrong generalizations.
3. The collection of data for inductive is a complex job. An investigator using this method requires a high degree of competence and training. Besides sophisticated tools of analysis.

B) Deductive :-

Deductive is the process through which we reach up to particular conclusion with the help of universal facts or in other words, deductive is the process of drawing generalization, through a process of reasoning on the basis of certain assumptions which are either self evident or based on observation. In deductive we deduce generalizations

from universal to particular. Deductive can give conclusive evidence. Depending upon the premises, every deductive reasoning is either valid or invalid. The main task of deductive logic is to clarify the nature of relations between premises and conclusions in valid arguments. It is concerned with the working out of logical implications between propositions. Let us consider an example :-

All men are mortal.
John is a men.
∴ John is mortal.

Merits of Deductive :-

1. It is a simple and easy method which is not time consuming and expensive.
2. This method leads to accuracy and precision in generalization because it makes use of logic and mathematical tools of analysis. If the premises are true we can easily get a true conclusion.
3. In a social science like economics, where there is limited scope for experimentation, this method becomes the only available method for the development of the subject.

Demerits of Deductive :-

1. It is harmful, when universal validity is claimed for the generalization arrived at by deductive particularly, when the premises are incorrect or particularly correct. If policy prescription are based on deductive the consequences may be dangerous. The deductive "armchair" analysis should be taken with caution and care.
2. If the assumptions upon which deductive reasoning is based are untrue or partially true, the

inference drawn become automatically beyond truth, therefore having no operational validity.
8. Deductive method is abstract. If a large dose of abstraction is used in theorising the result in the creation of "intellectual toys" and useless "implicit theorising."

6) Importance of Language And concept Formation:-
Piaget's study of the four developmental stages throws much light upon the development of thought process. In the act of thinking emphasis has been made on language and mathematics. Therefore, without discussing these phenomena any attempt to explain thinking is incomplete. Piaget (1965) has published his studies. The language and thought of the child. after completing this experiment on two six year old boys in morning classes at school. Whatever the boys said was recorded in complete detail. The data were analysed and classified. The language of the two subjects was classified into two categories as egocentric language and socialized language. These two together is called Spontaneous language.

In the egocentric language there is no reference to objects or to any one who is listening to his talk. The child speaks only about himself. Three elements were observed in the child's egocentric talk. Firstly, there was repetition with sense and non-sense language. secondly, it was monologue, it was like the child's louder thinking. Thirdly there was collective monologue talk of another person's physical presence. He spoke loudly in the presence

of others.

In the socialized language there are five functions. The first is adapted information. The listner's view is admitted. The second is criticism In this there is important for affective aspects. Other's view are criticized and the self is ascesta ined. Thirdly there is are commands, threats and requests. There is need for interaction between one child and the other. Fourthly, there is raising of many questions and fifthly, the answers are expected from others, other children. This is how language development in children is taking place. Piaget states that the adult thinks socially even when he is alone. But the child under seven years old thinks ego-centrically even in the presence of other.

7) Theories of concept Formation :-

A) Direct SR Theory :-

One approach to concept learning derives quite directly from Restle's (1955) theory of discrimination learning. Bourne and Restle (1959) extended this theory to provide a mathematical account of concept identification. The theory assumes that each stimulus attribute give rise to numerous abstract stimulus elements. These abstract elements are only hypothetical and they are not identified directly with observable events. on any given trial the subject somehow samples from the stimulus elements available, and these sampled elements available, and these sampled elements become associated with the correct response at

the time of reinforcement.

The stimulus element that are sampled and conditioned on each trial comes from both the relevant and irrelevant attributes. Over several learning trials, however, it is assumed that more elements from the relevant attributes are sampled and become associated with the correct responce. since elements from the irrelevant attributes appear in both positive and negtive instances, their influence is preasumbly adapted at over trails, through the process of extinction. Learning is said to be complete when all relevant stimulus elements are ineffective.

The main objective of the Bourne and Restle theory is to describe the course of attribute identification and the basic parameter of the theory is the rate at which associations are formed and adapted out.

B) SR Mediational Theory:-

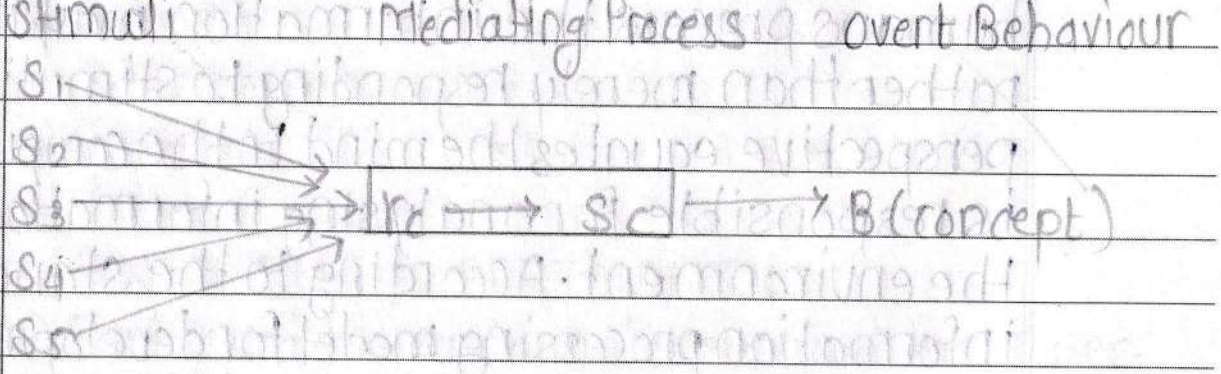
Theories of associative mediation have played a prominent role in the history of psychology. Most such theories have developed from the work of clarck Hull in the 1930's. The defining characteristic of mediation theory derives from the Hullian concept of a "pure stimulus act". such acts are viewed as internal responses whose sole function is to produce internal stimulation, which then serves as a cue for further overt behaviour. Pure stimulus acts are thought of as reduced, internal fragements of previously acquired overt behaviour. The overt behaviour itself is aquired in associative theory. But once the overt behaviour is aquired, the

detachable fragements refered to as pure stimulu acts can occur independently of the presence of the original stimulus conditions and therefore, can serve to mediate new behaviour.

According to associative mediat theory, conceptual behaviour can be described in terms of aquiring an equivalance for a set of perceptibly different stimulus events. For example, according to this view, lettuce watermelon and spaghattiare all instances of the concept food, not because they elicit common mediational responses such as anticipatory salivation or chewing.

Following is a simple digram in which mediating process is identified as consisting of these reduced, internal responses (r_c) and their stimulus consequences (s_c)

* Digram:-



c) Hypothesis Testing Theory:-

In constant associative mediation theory, this theory assures an active internal process on the part of the learner. In general they assume that 's' behaviour is always guided by some hypothesis and the learning process is characterised by selection and testing of the attnature hypothesis. The most influential treatment of

conceptual behaviour in terms of hypothesis testing comes from the work of Bumer Growdown and Austin. The approach suggested by these investigation in discriptive no theory of conception behaviar is advanced.

A second aspect of Bumer's characterisation of conceptual activity is the emphasis upon the strategies the 's' uses. one of the strategy outlined is called conservative focusing. This is most useful with the selection paradigm. since it is assumed that 's' initially considers all hypothesis simultaneously on each trial requests a stimulus event that differes from the last event in exactly one attribute.

D) Information Processing Approach:-

The theory is based on the idea that humans process the information may reclue rather than merely responding to stimuli. This perspective equates the mind to the computer which is responsible for analysing information from the environment. According to the standard information processing model for development the mind machinary includes attention mechanism for bringing information in working memory for actively manipulating information and long term memory for passively information so that it can be used in the future. This theory address how as children grow, their brains likewise mature. leading to advances in their ability to process and respond to the information they recieve through their senses. The theory emphasized a continuous

pattern of development in contrast with cognitive development theorists such as Jean piaget that thought development secussed in stages at a time.

- HYPOTHESIS :-
  Individual uses common strategies in the process of concept formation.

- VARIABLES :-
Independent variable :- Different concepts in the form of pictures.
Dependent variable :- concept formation.

- MATERIAL :-
A set of 48 cards including 8 concepts (6 cards per concept).
Prearrenged data sheet
Stationary
Wooden screen
Stopwatch.

- PLAN OF THE EXPERIMENT :-
1) Each card is randomly presented for 5 sec. This 1st trial is called as recognition trial.
2) From the next trial, cards are shuffled and presented randomly. Subject has to recall nonsence syllable associated with the card. Subject's wrong responses has to be corrected till 2 trials only.
3) This process should be continued till 2 consequtive errorless trials.
4) After this subject has to explain how he has

sorted cards in specific group.

- PRECAUTION :-

1) Cards shouldn't be shown to the subject before the experimenter.
2) Experimentor should shuffle the cards before the trial.
3) Experimentor should present each card only for 5 sec.
4) Experimentor should not correct subject after 3rd trial onwards.

- PROCEDURE :-

Arrenge the cubical properly. Experimentor called subject inside the cubical. Rapport was established and instructions were given:-
"I will show you some cards having pictures or geomettical figures on it. After showing each card I will utter one meaningless 4 letter word. In this way I will show you all the cards [Hold each card for 5 sec. infront of the subject]. After that I will show you same cards and you have to tell me the meaningless words, I told you earlier. If you are not correct I will tell you the correct word for some trials. This process will continue till you recall meaning less words for all the cards correctly for 2 back to back trials without any error."

- RESULT SHEET :-

1) 1st trial.

	I	II	III	IV	V	VI	Total CR.
LAGH	GALB	GALB	GALB	MUKR	FARH	✓	1
MUKR	CEVT	✓	✓	GALB	GALB	✓	3
BIKT	FARH	GALB	GALB	JISP	✓	✓	2
CEVT	JISP	✓	✓	GALB	✓	BIKT	3
GALB	LAGH	KEMG	BIKT	CEVT	✓	✓	2
FARH	GALB	✓	GALB	✓	✓	✓	4
JISP	✓	✓	✓	✓	✓	FARH	5
KEMG	FARH	FARH	JISP	GALB	✓	GALB	1

2) 2nd Trial.

	I	II	III	IV	V	VI	Total CR.
LAGH	✓	FARH	✓	✓	GALB	✓	4
MUKR	✓	✓	✓	✓	✓	✓	6
BIKT	✓	GALB	✓	LAGH	✓	CEVT	3
CEVT	✓	✓	JISP	✓	✓	✓	5
GALB	LAGH	JISP	✓	CEVT	✓	✓	3
FARH	LAGH	✓	JISP	CEVT	✓	✓	3
JISP	✓	GALB	✓	✓	KEMG	✓	4
KEMG	CEVT	JISP	✓	✓	✓	✓	4

- 3rd Trial

	I	II	III	IV	V	VI	Total CR
LAGH	✓	✓	✓	✓	✓	✓	6
MUKR	✓	✓	✓	✓	✓	✓	6
BIKT	FARH	FARH	✓	✓	FARH	✓	3
CEVT	✓	✓	✓	✓	✓	✓	6
GALB	✓	✓	✓	✓	✓	✓	6
FARH	✓	✓	BIKT	✓	BIKT	✓	4
JISP	✓	✓	✓	✓	✓	✓	6
KEMG	FARH	FARH	FARH	BIKT	BIKT	BIKT	0

- 4th Trial.

	I	II	III	IV	V	VI	Total CR
LAGH	✓	✓	✓	✓	✓	✓	6
MUKR	✓	✓	✓	✓	✓	✓	6
BIKT	FARH	✓	✓	✓	✓	✓	5
CEVT	✓	✓	✓	✓	✓	✓	6
GALB	✓	✓	✓	✓	✓	✓	6
FARH	KEMG	KEMG	BIKT	✓	KEMG	✓	2
JISP	✓	✓	✓	✓	✓	✓	6
KEMG	FARH	FARH	KEMG	✓	FARH	FARH	1

- 5th Trial.

	I	II	III	IV	V	VI	Total CR
LAGH	✓	✓	✓	✓	✓	✓	6
MUKR	✓	✓	✓	✓	✓	✓	6
BIKT	✓	✓	✓	✓	✓	✓	6
CEVT	✓	✓	✓	✓	✓	✓	6
GALB	✓	✓	✓	✓	✓	✓	6
FARH	✓	✓	✓	✓	✓	✓	6
JISP	✓	✓	✓	✓	✓	✓	6
KEMG	✓	✓	✓	✓	✓	✓	6

6th Trial

	I	II	III	IV	V	VI	Total CR
LAGH	✓	✓	✓	✓	✓	✓	6
MUKR	✓	✓	✓	✓	✓	✓	6
BIKT	✓	✓	✓	✓	✓	✓	6
CEVT	✓	✓	✓	✓	✓	✓	6
GALB	✓	✓	✓	✓	✓	✓	6
FARH	✓	✓	✓	✓	✓	✓	6
JISP	✓	✓	✓	✓	✓	✓	6
KEMG	✓	✓	✓	✓	✓	✓	6

- Treatment of The Result :-

Name of the Concept	Trials taken to form Concept	Total No. of Correct Response	% of correct response
LAGH	3	29	80%
MUKR	2	33	91%
BIKT	5	25	69%
CEVT	3	32	88%
GALB	3	29	80%
FARH	5	25	69%
JISP	3	33	91%
KEMG	5	18	50%

- INTROSPECTION :-

"The experiment was very interesting. In 1st trial I am clueless. I am not able to connect the patterns, names, pictures or anything. I am randomly assigning letters. In second trial I got the pattern of human face and by using this knowledge I tried to find similarities between the patterns. In 3rd trial I recognize the pattern of birds, animals, triplates and 6 no. In 4th trial I am able to recognize all other patterns but confused between KEMG, BIKT, ~~FARH~~ JISP. But in 5th trial my confusion got clear and in 5th and 6th trial I am able to associate all the pattern and name. To associate names first I tried to associate name with pictures but it is not helping so I tried to associate pattern and names and it worked."

Name : Madhura Vivek Pawar Expt. No.: _____

Class : MA.I Roll No. : 1865120

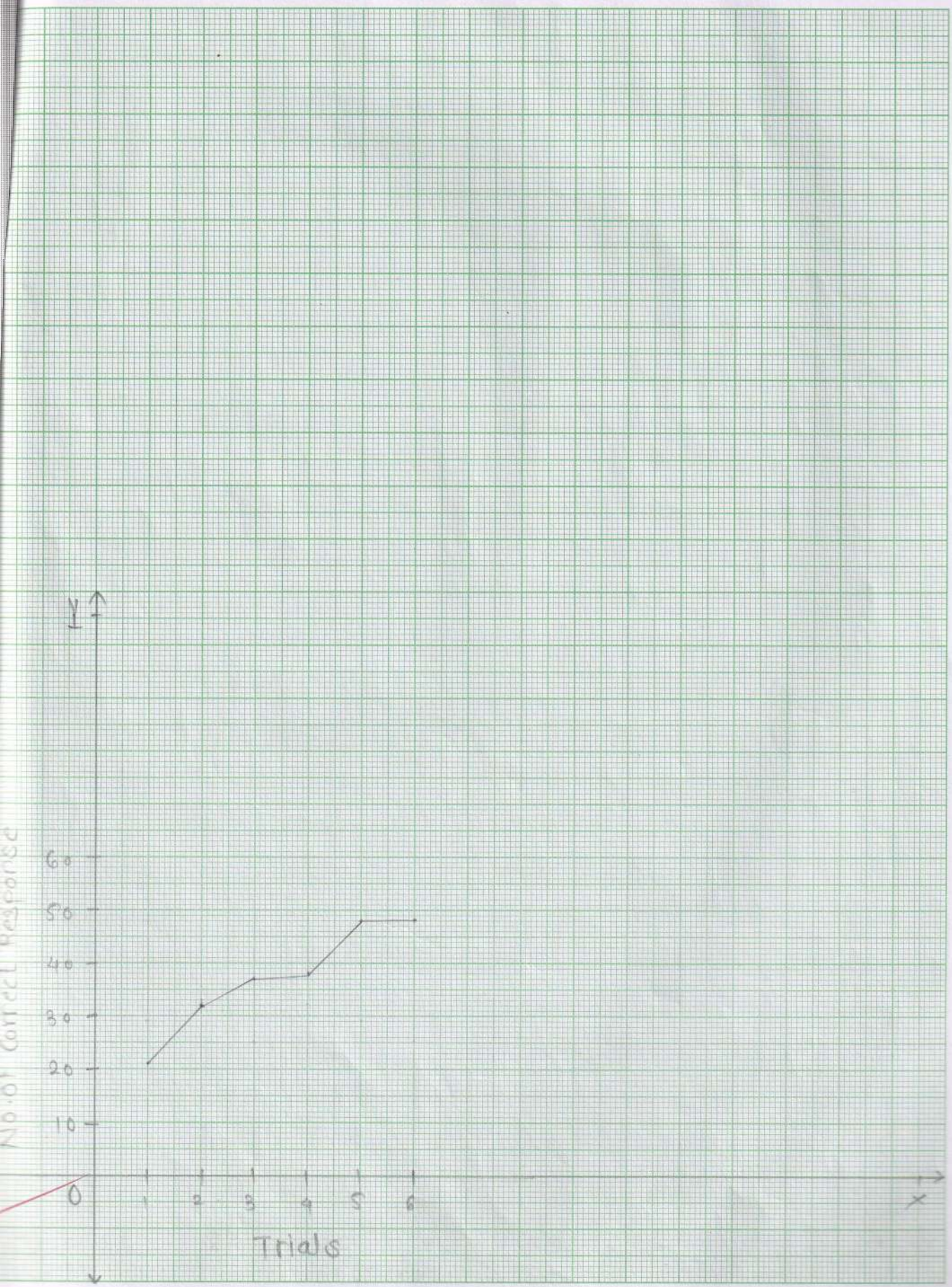
Title of the Graph : Graph showing no. of CR per trials.

Origin = ( )

Slope = _____

Scale
on x - axis, 1 cm = 1 trial
on y - axis, 1 cm = 10 CR

Intercept
on x - axis =
on y - axis =



Name : Madhura Vivek Pawar. Expt. No.: _____

Class : MA-I Roll No. : 1865120

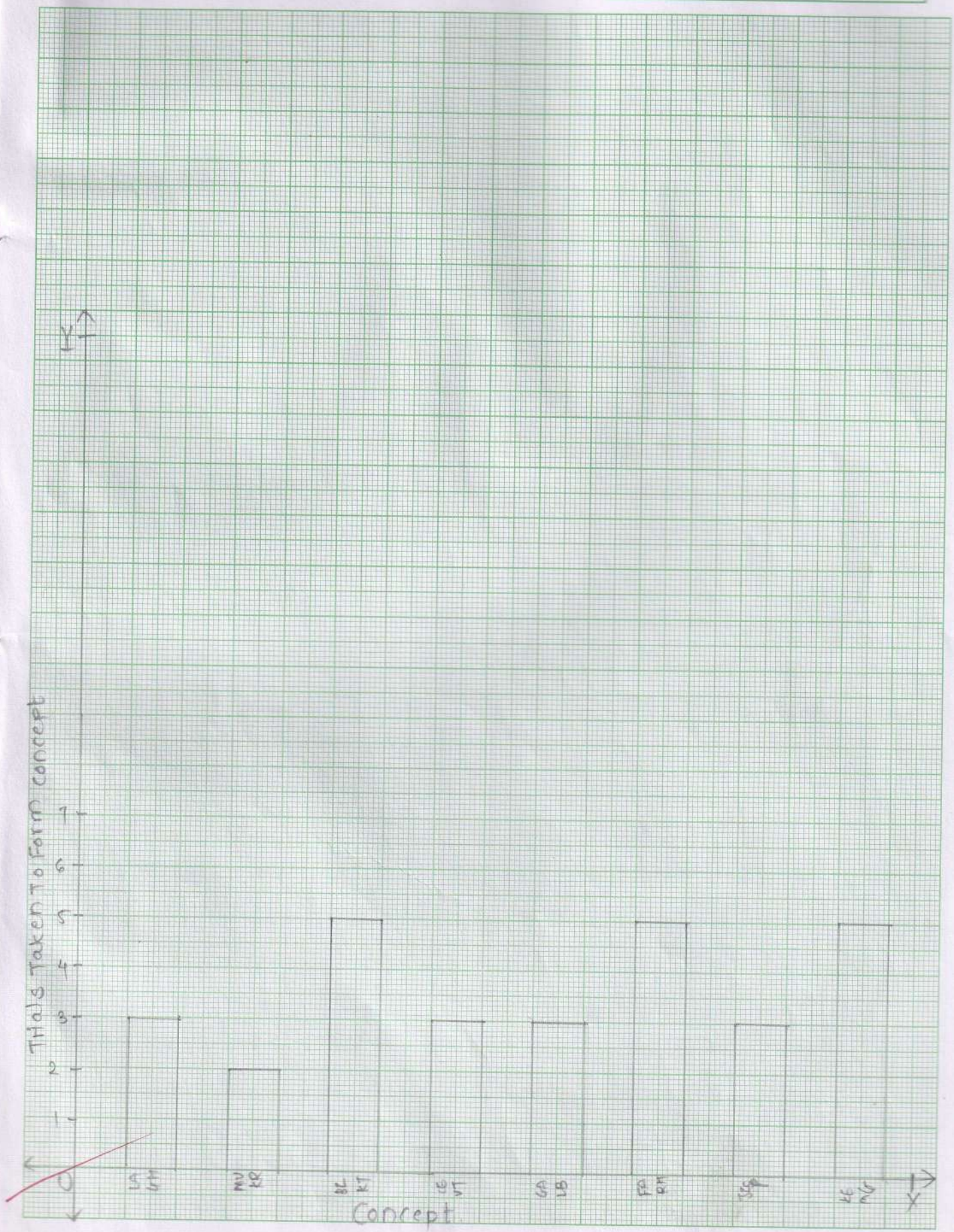
Title of the Graph : Graph showing ~~time~~ trials taken to form each concept.

Origin = ( )

Slope = _____

Scale
on x - axis, 1 cm = 1 concept
on y - axis, 1 cm = 1 trial

Intercept
on x - axis =
on y - axis =



Name : Madhura Vivek Pawar. Expt. No.: _____

Class : M.A (I) Roll No. : 1865120

Title of the Graph : Graph showing % of CR for each concept.

Origin = ( )

Slope = _____

Scale
on x - axis, 1 cm = 1 concept
on y - axis, 1 cm = 10 %

Intercept
on x - axis =
on y - axis =