GENESIS OF CONCEPT

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Submitted by

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Declaration of Originality and Compliance of Academic Ethics

I hereby declare that this thesis contains literature survey and original research work by the undersigned candidate, as a part of my Master of Philosophy in Cognitive Science degree during academic session 2017-2019.

All information in this document has been obtained and presented in accordance with academic rules and ethical conduct.

I also declare that, as required by these rules and code of conduct, I have fully cited and referred all material and results that are not original to this work.

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CERTIFICATE

This is to certify that the thesis entitled **"GENESIS OF CONCEPT"** is bonafide work carried out by **SWEETY PANDEY** under my supervision and guidance for partial fulfillment of the requirement for the award of degree of Master of Philosophy in Cognitive Science, Jadavpur University during the academic session 2018-2019.

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CHAPTER – 1

INTRODUCTION

Concepts are mental representations, the world is full of categories and the concepts help us to deal with them, it helps to summaries the world accurately. A person without concepts will not be able to survive in this world with huge information and situations to deal with. Concepts are important because it helps to organise mental life which allows us have summery representations of our experience of the world for example we have encountered various types of trees in our life which can be represented by the concept of a tree which we have formed.

Concept provide with a means which helps to identify objects ,even those things are not familiar to us moreover concepts provide with a mental process by which me generalised properties from known to unknown instances when we think we do not replay what we have seen or heard. (Denis mareschal, 2010) We are blessed with rich ideas that allow us to make sense of the world we live in and helps to organised the world in a meaningful way these ideas helps us to group different instances as the same kind of things. They also helps in combining in ways which we have never directly experienced we can say that these ideas allows us to conceptualised the world we live in so we called them a concepts.

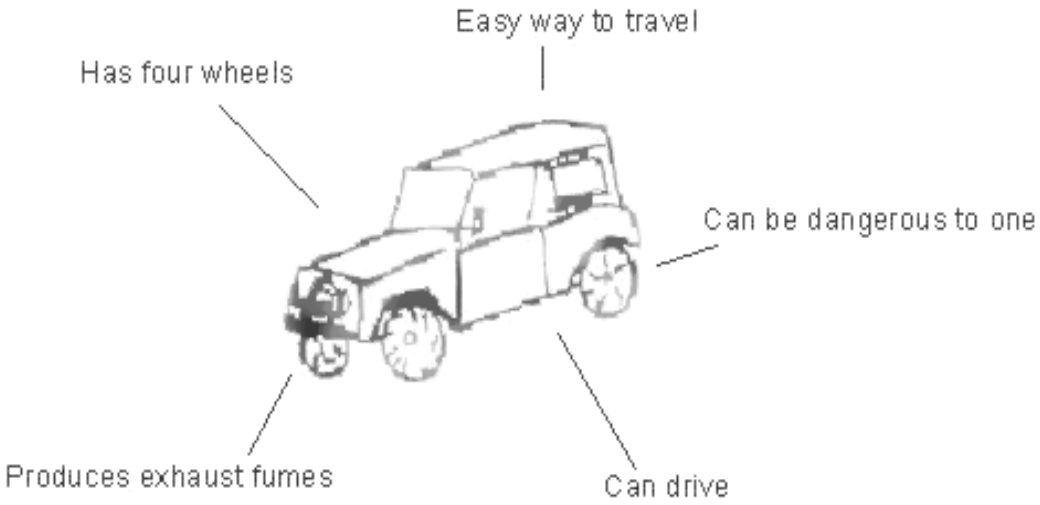

Figure 1.1-Example of concept of a CAR:

This picture describes the features of a car. The features include four wheels, have seats in it and it has a covered structure with doors. All these features combine to form the concept of a car, if we have concept regarding a particular car we can identify any other car which we have never seen before. In this way with the help of concepts we categorise things around us and identify them easily which will be discussed in detail in further chapters.

This dissertation aims to address role of conceptual development, it does so by discussing the importance of concept in different aspects of life. The result of this study indicates the meaningless and chaotic situation we will face without concept.

1.1 Road Map of the Dissertation:

In this dissertation the role of concept has been addressed by studying different theories and definitions of concept in different disciplines like psychology, sociology, linguistics and cognitive science.

Chapter -2

This chapter gives some definitions of the concept. It tries to see concepts as glue that holds our mental world together. (Murphy, 2004) An attempt has also been made to understand concept with the help of various examples. The chapter concludes with a brief discussion that concepts are representations located in mind which helps to identify things by using those representations.

Chapter-3

A brief survey on the different types of concepts with regards to views of different authors is done. In this chapter, primitive concepts and lexical concepts is also discussed in detail. Lexical concept models the semantic structure of language. The traditional view of meaning construction is based on words and their meanings so Lexical is more useful than Primitive and Complex Concepts.

Chapter-4

This chapter discusses the role of concepts in cognition. How concept influences mental processing is discussed with relative examples. Concepts allow us to create knowledge base. It is discussed that concepts enables the central functions of cognition.

Chapter-5

This chapter looks into how the concepts are formed by different processes like identifying basic principles and properties of objects. Concepts are organised as categories at the time of its formation. The concept formation is also discussed as an essential feature of human consciousness.

Chapter-6

In this chapter a survey of two theories that is classical theory and prototype theory is done in detail and a comparison is also done between the two theories for showing the preference of prototype theory over classical theory of concept.

Chapter -7

In this chapter the development of concept in children is discussed as a key component for language learning. How the concepts in children and in adults differ due to difference in processing capacity is also discussed.

Chapter -8

This chapter concludes by summarising the importance of concept development in our life for collecting information, use language, making, inferences, and adapting to environment is discussed. It is also mentioned that our every day activity without concepts will become meaningless and chaotic, just full of objects having no meaning.

CHAPTER -2

WHAT IS CONCEPT?

INTRODUCTION:

Concepts can be said as the basic building blocks of thoughts and belief, and it also plays a vital role in all aspects of cognition. Definition of the word concept and its formation is different for a psychologist, a philosopher or a linguistic. Concept is important to all the aspects of cognition, and it gives rise to so many controversies in philosophy and cognitive science. It can be thought of as bundles of features, or mental representations, answer regarding the definition of concept is very controversial.

2.1 UNDERSTANDING OF CONCEPT:

In Spite of disputes that arise from different views of what concept is there has been a significant amount of interdisciplinary interaction among theorists working on concept. An answer cannot be given in isolation; this term has an effective role to play in understanding the larger worldview which includes the nature of language, the nature of language, of meaning and mind. The correct definition of concept cannot be obtained without evaluating the subordinate areas where it plays a functional role. Concepts can be organised on levels of understanding ,there is a basic understanding of a concept of a ‘car’ with its super ordinate idea of ‘vehicles’ which includes all the things which have features like tyres, used for transport, have a steering/handle etc. In making of concept mind extracts similarities from various examples. The human mind is remarkable for its flexibility, we can construe any particular scene, or any element within

a scene, in a number of different ways, depending upon the perspective that we adopt at the moment and the task at hand.

The human mind , including the minds of infants and young children, represents a rich range of concepts, ranging from distinct individuals to categories and kinds .Our concepts include abstractions over individual objects (e.g. dog, animal), events (e.g. pushing, thinking) , and properties (e.g. fluffy , mischievous). we represent concepts that can be derived from immediate perceptual experiences (e.g. fluffy, cold) as well as concepts that relate to more complex internal emotional states (e.g. happy , mad) and abstract ideas (e.g. causation , animacy). (E Margolis, 1999) Our everyday understanding and analysis of thoughts and things around us help in formation of concepts. We are blessed with ideas that help us to make sense of the world we live in, which allows us to organise the world in a meaningful , consistent and predictable way, specifically , these ideas allows us to group different instances which are visible and of same kinds of things. Concepts are the glue that holds our mental world together. When we walk into a room, try a new restaurant, go to supermarket to buy groceries, meet a doctor or read a story. We must rely on our concepts of the world to help us understand what is happening (Murphy, 2004). Concepts are a kind of mental glue, which helps to tie our present interactions with the world, and because the concepts themselves are connected to our larger knowledge structures. The ideas which allow us to conceptualize the world we live in, and so we call them concepts. (Murphy, 2004).

Our concepts have much of our knowledge regarding the world, helping us to identify things around us along with their properties, it is not a great achievement to differentiate a dog with a horse and name it differently but our lives will be difficult without such conceptual ability. Concepts are mental categories used to group events, objects, information etc. For example, there are various designs, colours and

shapes of bottles are available in the market despite of that we can identify a bottle when we see one another example is the concept of clothes, clothes may be in any form like shirt, skirt, jeans, shorts, saree etc and may be worn by different people. Instead of these variations we can easily identify the clothes and their types and can differentiate between clothes and bottles because we have concepts of what bottles and what clothes are supposed to be. The traditional view of meaning construction in humans is based on words and their meanings, lexical entries combine together with the grammatical structure of a sentence, to give the sentence a meaning .It's a general truth that if you know what an X is then you also know what it is to have an X, this applies to concepts in particular. The question what they are? And what it is to have them are logically linked. For example, our theory is that concepts are WATERMELON then it will have to be part of our theory that having a concept is having a WATERMELON, and conversely if our theory is that having watermelons then it will have to be part of our theory that watermelons are what concepts are, having the concept of something is just having whatever the concept of that thing turns out to be. Concepts are constructed as mental particulars.

Concepts are said to be the constituents of thoughts ,they help in our judgement , categorization , inferences and carefully planned activities, by showing a child lots of birds, he/she acquire the concept of a bird ,example - A child learning the concept of 'FRUIT' for the first time when a child sees an apple it experiences a patch of red . This round patch is without meaning to the child , this is sensation then he came to know that 'round red patch' can be eaten and is called an apple now the child has a perception for the sensation and has meaning too, then the child comes in contact with grapes, watermelon, bananas etc. He notes that all of these are called 'FRUITS' the child notes some common properties of the various objects and from his experiences abstracts qualities that are the determinants of the classification 'FRUIT'. Concepts enable and advance understanding by aiding a

robust yet open textured grasp of how phenomena hang together systematically.

Concept formation consists of two process abstracting and generalizing , above mentioned example is of abstraction process .Generalization is the process of noting what substances possess the qualities of fruit and grouping them together. We can say that generalization is a reduction process since it saves the child from the trouble of attempting to remember all experiences. Researchers and scholars across the sciences and the humanities share a widespread sense for the importance of concepts, but several misconceptions about concepts is hampering a clear understanding. The assumption that substantive concepts have a simple and stable definition , might be stated in a few sentences and will then settle most controversial issues surrounding a given concept. One of the assumption is that what a concept amounts to is meaning of a word of common use, where everyday linguistic practice is the decisive authority for specifying a concept's content, while it is true that ordinary language is a central resource acting as consolidating factor for conceptual understanding, it is not true that it holds in store self-standing and normative binding elucidations of all possible concepts. (E.Rast, 2018) Concepts prove changeable, are subject to much inventive development and undergo a lot in the way of historical change, not in irregular ways but by answering to significant new developments in their domains of application.

Concepts help us in every aspect of our life, without concept we would not be able to live our life simply as we do. It helps in making associations and discrimination, helps to speed up our memory, it helps in guiding of our actions and behaviours and it helps to generalize information from membership patterns and relationship. Moreover, concepts are tied up in complex ways with the articulate and

judgemental capacities of concept users, and thus with these individuals' particular learning histories and skill sets.

2.2 WORKS ON CONCEPT:

Psychologists and cognitive scientists are still working a lot to understand the different aspects of Concept ,for example the nature of concept, its importance and use in our life, its use in communication , their development, inference, and memory. Work on concept is a key component in all scholarly and scientific work, regardless of whether it takes place in the humanities or in the sciences, in cultural studies, ethnology, sociology or the arts. By work on the concept we mean the creation, development and continuous refinement of content full yet concise concepts that are capable of opening up focused perspectives on selected segments of reality. Mathematicians' concept of category and its' application helps us to understand how concepts work in practice, in particular how they can evolve, and how they can interact with other concepts within their broader contexts. The word category has a complex history in which it manifested as many different concepts. Aristotle introduced the term into philosophy, and then the idea was later taken up and modified by others, including the medieval scholastics, like Immanuel Kant. (E Margolis, 1999) Later, Friedrich Hegel and Charles Sanders Peirce criticized Kant and put forth their own theory of category. In the early 1940's, Samuel Eilenberg and Saunders Mac Lane developed their theory of categories, they borrowed the word from Kant , but their concept is very different from Kant's philosophy .They gave a semantic formalization of the notion of a mathematical structure: the category for a structure contains all mathematical objects having that structure, but the real innovation of category theory is that the category also contains all structure preserving "morphism" between its objects, along with an operation of composition for these morphisms. Category is not an isolated concept,

but part of a large network of interrelated concepts, called category theory. There are also other ways of defining the category concept. (E Margolis, 1999) For example, one of these involves only morphisms, in such a way that objects can be recovered from the identity morphisms. The precise sense in which the various definitions are equivalent can be a bit subtle. A powerful approach to understanding the category concept is to look at how it is used in practise. We will find that different communities use it in different way. Many mathematicians look down on category theory seeing it more as a language or a tool for doing mathematics, rather than an established area of mathematics. The evolution of concepts called category from Aristotle's ontological interpretation of syntax, through a multitude of later philosophies, into mathematics and then computer science, has been long and complex, with many surprising twists, and it is clear that the mathematical concept is different from Aristotle's original, as well as from the intermediate philosophical concepts. This evolution has been shaped by the particular goals and values of the communities involved, and views of what might be important gaps in the current philosophical, mathematical, or technical systems, have been especially important, despite the differences, there is a common conceptual theme of capturing essential similarities at a very abstract level. (Murphy, 2004) The category theoretic concepts is not so different from that of Aristotle and later ordinary language philosophers , who sought to improve how we think by clarifying how we use language and in particular by preventing category errors.

Concepts can evolve over very long periods of time, but can also change rather quickly, and the results can be surprising, example the categories of Aristotle, Kant, Hegel, and Peirce. Various inconsistent versions of a concept can flourish at the same time, and controversies regarding which one of them is correct can be many. Concepts can become problematic when pushed further than originally intended, which further requires the invention of further concepts to maintain

their life, as when category theory required new foundations. (E.Rast, 2018) The same concept can be used very differently in different communities: the uses of categories by working mathematicians, category theorists, and computer scientists are very different, despite the mathematical definitions being identical, one might question whether the concepts should be regarded as identical. Moreover, these differences can lead to serious mutual misunderstandings between communities. For example, mathematicians give importance to deep results which in practice means hard proofs of theorems that fit well within established areas, whereas computer scientists must be concerned with practical issues such as efficiency, cost, and user satisfaction. These differences make it difficult for category theorists and computer scientists to communicate; by above discussion on social and mathematical perspectives on concept we can conclude that despite this diversity there has been a main single goal, which is to facilitate the design and implementation of systems to support information integration. It can be argued that some concepts have a hard physical reality, manifesting as perceivable regularities of behaviour or as invariants over perception. It can also be argued that other concepts are formal transcendental, existing independently of humans and even physical reality. But as realized long ago by the Indian philosopher Nagarjuna phenomenological human concepts are not like that: they are elastic, situated, evolving, relative, pragmatic, fuzzy, and strongly interconnected in domains with other concepts; the thoughts we actually have cannot be pinned down as scientific or mathematical concepts. (A.K.Warden, 1971)

2.3 DISCUSSION:

There are several views on how phenomenological, social, and scientific approaches to concepts can be reconciled, in general, they argue that the phenomenological and the social are interdependent, in

that concepts necessarily exist at both levels, and that scientific and mathematical concepts are not essentially different from other concepts. A concept derives its' reality not from the status, authority or unique skill set of the person inventing or articulating it, but from the dynamic of being received by others, by its power of explication in the eyes and the practices of others responding to and continuing and initial creative impulse of concept construction. Concepts are real in virtue of the work they can do on situated individuals and their practical orientations. The more dynamic stability a concept gains in spread out webs of intellectual practice, the more it becomes a significant factor in its own right. Thus we can say that a concept only exists in the plurality of its articulations, in a loose yet specific enough nexus of interrelated practices of explication, elaboration, reception, uptake, transformation, contestation and critique.

CHAPTER -3

TYPES OF CONCEPT

INTRODUCTION:

When we are taking about definition of concepts or what concept is there are different views regarding this. Throughout the history of philosophy many philosophers have tried to define concepts, although most philosophers share the view that concepts are building blocks of thoughts, at the same time some philosophers are of view that concepts are abstract entities according to Frege, concepts are objective, mind - independent entities. From psychological point of view, concepts are identified as representations located in the mind; they say thinking is a psychological process that occurs in an internal system of mental representation. Some of the Fregan philosophers have identified concepts with certain basic cognitive abilities such as the identification and re -identification of substances. By Aristotelian lineage we understand concepts as dynamic tools for thinking. We will find various definitions of concepts some of them are as stated by Gregory L. Murphy – it is a non-linguistic psychological representation of a class of entity in the world. Another states that, it concepts are mental representations of the world. Concepts can be organized hierarchically, high levels of which are termed as "super ordinate" and lower levels termed as "subordinate" concepts arise from experience from childhood. (E Margolis, 1999) It is basic idea which we are innate from our birth. It is our knowledge of what kinds of things there are in the world and what properties they have.

3.1 DIFFERENT VIEWS ON CONCEPT:

A Concept is a common feature or characteristics. Every concept is connected to exactly one word, and every word has exactly one

concept as its meaning. The meanings of the words are represented psychologically by mapping words into conceptual structures. But some concepts are not labelled by words like ambiguous words have two meanings and hence are connected to two concepts. How concepts represent meaning or conceptual system is a highly interconnected set of facts and beliefs. Another simple definition of concept suggests that concepts are ideas that integrate various elements into a whole. There elements can be ideas, notions thoughts and observations. According to Morgan, concept is a process of representing a common property of objects or event. Therefore, we can say that concepts help us to communicate, conserve mental space, predict and generalize and organize our world. (E Margolis, 1999)So it is the concepts that help us to represent the world to ourselves in thoughts. Thoughts are seen as having parts namely concepts. Concepts also play a foundational role for understanding the nature of cognition.

What is concept, and what does it mean to possess one? My assumption will be that concepts can be treated like numbers in the following respect. We can answer most questions about numbers, for instance what 4 plus 8 equals or what the square root of 99 is without having to answer whether numbers are abstract objects or not, concepts can be treated similarly. There are several ways to possess a concept, but they have a common belonging for example to possess the concept of an alphabet A is to have the ability to type-identify A in ideal contexts. Here type-identify means to classify or categorize a particular A as an A. Similarly, to possess the concept of a peacock is to have the ability to consistently type-identify peacocks in ideal contexts that is to be able to consistently classify a given peacock as a peacock. The classical view of concept holds that concepts are definitions. (E Margolis, 1999)For example, a subject possess the concept of a bachelor if and only if it have the definition that a bachelor is an unmarried man. Hence, we can say that relevant information about the person, that is the definition enables us to type-identify bachelors, or

categorize bachelors as bachelors. A category is a set of objects that can be treated as equivalent in some way. The objects in a category can be different from one another but they have many commonalities. The psychology of categories concerns how people learn, remember, and use informative categories. The mental representations we form of categories are called concepts. It can be assumed that people's concept correspond more or less closely to the actual category, but it can be useful to differentiate the two, as when someone's concept is not correct. According to second view of concepts is prototype, a subject's concept of mammals, for example is a prototype of a mammal having prototypical mammal features. The prototype helps us to consistently type-identify mammals. (E Margolis, 1999) The psychology of concepts has the goal of understanding the representation that allow us to do all things, most importantly identifying objects and events as being in a certain category drawing inferences about entities and communicating about them, for example although I've never seen a particular apple in front of me now, maybe it's like other apples I have eaten and so it's edible. If we have formed a mental representation to the class of that object, then that understanding will help us in understanding and responding appropriately.

We can say that there is nothing of great intellectual achievement to identify a tree or to know what to do with a pen, but life seems to be impossible without such conceptual ability. We came across a lot of things everyday like a bus, its seat, the signal lights etc. On the next day, when we encounter another bus it gets added on as a new exemplar of that categories, if we were unable to conceptualise it or identify the similarity of that bus to the one we have seen yesterday we have to study it, it's functions whether it will be harmful or helpful to us. We don't do all these we draw inferences very quickly with no difficulty but the process of categorization is complex and huge, and we gather huge information every day. Concepts may have a great variety of forms and contents; this is the area which makes it complex.

The mental glue which concepts provide is not only applicable to the familiar categories of object, but also to social and person categories, emotions, event actions. (E Margolis, 1999) Our behaviour towards a person differs accordingly to our information and assumptions about the person. For example, if informed by someone else that the person we are about to meet is a minister and the other is a priest our behaviour towards the two persons will be different because of our assumption. Concepts are similarly important to every group of population across the world, it is found in all the aspects of living of the people across ages, it does not matter how intelligent a person is, no one can do without them. For example, if a person has no concept about what is eatable and what is not he will starve while surrounded by food, because he or she had never seen that particular food before and so does not know what to do with them.

Concepts also creep in our everyday life and thought is through communication, while talking we try to communicate ideas about the objects people and events that take place around us. We understand those objects, people and events through concepts, our word and sentence meaning are linked with conceptual representation. Research carried out in the field of concepts say that concepts are everything because they add meaning to everything around us without concept everything is meaningless. Across different people, levels of experience with the category, tasks and domains, concepts may vary in many ways. Concepts can be treated as a name or label that regards an abstraction as if it had material existence, such as a person, place, or a thing. Abstract ideas and knowledge which include freedom, equality, science, happiness etc are also symbolized by concepts; a concept is just a symbol, a representation of the abstraction. (Denis mareschal, 2010) Concepts are named to describe, explain and capture reality as it is known and understood. Concepts are also described as categories or grouping of linguistic information, images, ideas, or memories, such as life experiences. Concepts are, the vast ideas that are generated by

observing things in details, afterwards categorizing and combining these details into cognitive structures. A concept is used by us to see the relationships among the different elements of our experiences and also helps us keep the information in our mind organized and accessible.

3.2 PRIMITIVE, COMPLEX AND LEXICAL CONCEPTS:

Concepts are again of three types: Primitive, Complex and Lexical concepts. Most discussion of concepts have centred on lexical concept .Lexical concepts are concepts like animals, colours etc roughly ones that correspond to lexical items in natural language. It helps a person to think that words in natural languages have a meaning that forms the concepts which a person to express. In some discussions concepts are said as just those mental representations that are expressed by words in natural language. Lexical concepts are linguistics, associated with linguistic forms such as words, affixes, and constructions. Their representation of meaning is schematic, limited to representations that are specialised for being encoded by language. They provide access to the much richer representation associated with the conceptual system which is not directly encoded by language although language facilitates access to this level. (E Margolis, 1999) What happens when we try to understand what someone is saying is that the words allow us to access some of our cognitive models, among which we select one that matches our encyclopaedic knowledge of the way things are, including the context of the utterance. Complex concepts in contrast are concepts that are not primitive. Complex concepts are Primitive concepts are also called atomic concepts or features, talking all these in notice we can say that a concept lack structure .This take us to the next point of discussion of models of conceptual structure.

Concepts can be divided into two categories in psychology that are natural and artificial concepts. Natural concepts are those which are

created naturally through our experiences and it can be developed either from direct experiences or indirect experiences. For example, if someone lives on a mountainous area he/she probably had a lot of experience with snow. They have watched it fall from the sky, walked on it, and faced the problems of road blockage due to heavy snowfall. In short they know snow how it looks like, tastes like and feels like. On the other hand, if someone lived his/her life whole life in the coastal area, may be they have never seen actual snowfall, neither they have touched it or felt it. The snow is known to from the indirect experiences of seeing pictures or watching movies showing falling of snow. In the both cases, snow is considered as a natural concept because we can construct an understanding of snow through direct observations or experiences of snow. On the other hand, an artificial concept is a concept that is defined by a specific set of characteristic. Properties of various geometric shapes, like triangles and squares, can be used as useful examples of artificial concepts. A triangle always has three sides and three angles. A square always has four equal angles and four right sides. Mathematical formulas, like the equation for area (length* width) are artificial concepts which are defined by specific sets of characteristics that are always the same. Artificial concepts can help us to increase the understanding of a topic by building on one another. For example, while learning the concept of area of a square we must understand what a square is prior to it. Once the concept of area of a square is understood, an understanding of area for other geometric shapes can be understood upon the original understanding of area. The use of artificial concepts to define an idea is important for communicating with others and engaging in complex thought. Concepts can be treated as building blocks and can be connected in countless combinations which help to create complex thoughts.

3.3 DISCUSSION:

The traditional view of meaning construction in humans is based on words and their meanings, lexical entries combine together with the grammatical structure of a sentence, to give sentence a meaning. Lexical concepts are actually complex representations; Primitive concepts on the other hand lack structure. Lexical concepts play an initial role in the complex linguistic and non linguistic processes helps in interpreting an utterance, role of providing access to encyclopaedic knowledge, knowledge which is organised into cognitive models.

CHAPTER - 4

CONCEPT IN COGNITION

INTRODUCTION:

Cognition is a term which refers to the mental processes that are involved in gaining knowledge and comprehension. These processes include thinking, knowing, remembering, judging and problem solving. Cognition involves not only the things that go on inside our heads but also how these thoughts and mental processes influence our actions. Our attention to the world around us, memories of past events, understanding of language, judgement about how the people around us works, and abilities to solve problems all contribute to how we behave and interact with our surrounding environment.

4.1 WHAT IS COGNITION?

The survey of work in cognitive semantics, focus on the notion of concept. (Murphy, 2004)The study of how we think dates back to the ancient Greek philosophers Plato and Aristotle. Plato's approach to the study of the mind suggested that people understand the world by first identifying basic principles buried deep inside them and then using rational thought to create knowledge. This viewpoint was later advocated by philosophers such as Rene Descartes and linguist Noam Chomsky (E Margolis, 1999).In a series of papers that are a foundation for contemporary cognitive semantics, Eleanor Rosch designed, performed, and analyzed innovative experiments, resulting in a theory of human concepts that differs greatly from the Aristotelian tradition of giving necessary and sufficient conditions, based on properties. Rosch showed that concepts exhibit prototype effects, for example, degrees of

membership that correlate with similarity to a central member. Moreover she found that there are basic level concepts, which tend to occur in the middle of concept hierarchies, to be perceived as gestalts, to have the most associated knowledge, the shortest names, and to be the easiest to learn. Conceptual spaces do not attempt to formalize concepts, but instead formalize the important idea that concepts are used in clusters of related concepts.

Cognition is noted as an essential feature of human consciousness, but all aspects of cognition are not experienced consciously. Cognitive psychology is the field of psychology that is involved in examining how we think. It helps us to explain why and how we think the way we do with the help of the interactions among human thinking, emotion, creativity, language, and problem solving, in addition to other cognitive processes. (A.K.Warden, 1971) Cognitive psychologists help to measure and determine different types of intelligence, why some people are better at problem solving than others, and how intelligence affects success in the workplace. They also focus on how we organize thoughts and how information is gathered from our environments into meaningful categories of thought. The nervous system of human is capable of handling endless streams of information. The senses act as the interface between the mind and the external environment, receiving stimuli and changing it into nervous impulses later that are transmitted to the brain. The brain then processes this information and uses the required information to create thoughts, which can be then expressed through language or stored in memory for future use. This process is much more complex than it seems like the brain gather information not only from external environment. When the thoughts are formed, the brain also gathers information from emotions and memories. Emotion and memory have impactful and great influences on both our thoughts and behaviours. In order to store and differentiate this huge amount of information, the brain has developed a file cabinet in the mind. The different files which are stored in the file cabinet are called concepts.

Cognitive scientists try to understand the exact nature uses and development of concept. Mental states and linguistics entities exhibit vagueness to the extent that we can question the applicability of those entities in thought, argument, or communication. (A.K.Warden, 1971) For example, ordinary concepts and terms show vagueness when there are borderline cases where people might disagree as to whether or not the concept or term actually describes the case or whether the term applies. Our concept of fruit exhibits vagueness as many people may disagree as to whether or not for instance a cucumber counts as a fruit. In contrast, ambiguity in a mental state or linguistic entity results from the possibility of multiple different contents. For example, many terms in the English language have ambiguities. The word BANK can be refer to a financial institution, it can also refer to the side of a river. All of these meaning are appropriate within our language. Nevertheless, when someone uses the word BANK the possibility of other interpretations can undermine successful communication or argumentation.

4.2 ROLE OF CONCEPT IN COGNITION:

Concepts can be called as groupings or categories of linguistic information, images, ideas, or memories, such as life experiences. Concepts are the big ideas that are generated by observing details of things around us, and later categorizing and combining those details into cognitive structures. We use concepts to organise the relationships among the different elements of our experiences and to keep the information in our mind accessible and organised. (C.Wallis, 2015) Concepts get informed by our semantic memory and it is present in every aspect of our lives, for example in a classroom when we study the history of India we learn more than just individual events that happened in India's past. We absorb a large amount of information by listening to and participating in discussions, and reading different

books as sources. Our brain studies these details and later develops an overall understanding of Indian history. In this process, our brain gathers details that help to inform and refine our understanding of related concepts like power, freedom, struggle, nationhood, and democracy.

Cognitive psychologists and philosophers assume concepts are the basic constituents of thought and belief. In other words, they play a major functional role in the operation of any intelligent system. Most fundamentally, concepts facilitate categorization. Categorization can be done in two ways, firstly concepts allow us to treat various objects, properties, events, or relations as instances of the same type of thing that is, concepts group objects, properties, events, or relations together into a class on the basis of shared features thereby allowing a person to think about an item in a manner that abstracts from many of the particularities of the specific item. Therefore we can say that the first important role of concepts in cognition is to categorize the world, to take the variables and complex world of experience bundle it into more manageable, useful, and re-identifiable components. In short, by facilitating categorization concepts allow one to sort objects, properties, events, and relations into classes on the basis of shared features. (Murphy, 2004) The concepts of a bottle groups together all sort of objects having all sorts of differences and some important similarities, for example bottles serve a purpose of providing a portable container with which one usually carries liquids. By facilitating categorization, that is the collection of a group of individual objects, properties, events, or relations within a single class, by all these concepts perform a number of central functions. Secondly in addition to categorization concepts allows us to create and organise a record of one's past experiences for future use. (C.Wallis, 2015). Thus, concepts allow us to create a knowledge base from our past experiences and provide an organizational structure for that knowledge base. Every

time when we recognize an object as a chair or a pen we access a set of basic information about those from our past experiences with them.

Concepts can be abstract and complex, like justice, or it can more concrete. In psychology, Piaget's stages of development are abstract concepts. Some concepts, like characteristics of best friend and good behaviour are personal and individualized. In these way concepts covers every aspect of our lives, from our daily routine to all the other activities of all the people in the world. Concepts are at the core of intelligent behaviour of every person. It is expected from all the people to be able to act properly in new situations and to identify when confronting new objects (Murphy, 2004). For example, if we go into a new classroom and see chairs, a blackboard, benches etc we know what these things are and how they will be used. We will sit on one of the bench and expect the teacher to write on the blackboard and sit on the chair, we do this even if we have never seen any of those particular objects before, because we have concepts regarding classroom, chairs, chalk, duster, blackboard, and so forth which helps us to identify what they are and what we are supposed to do with them, concepts helps us to act according by identifying the usage of the objects in front of us. Furthermore, if someone tell us a new fact about the chalk that it is made from sedimentary rock of the same name, a form of soft limestone and it is found in different colours too, we are likely to extend this fact to other chalks we will encounter in future. In short, concepts allow us to extend what we have learned about a limited number of objects to a potentially infinite set of entities.

In order to understand the role which concepts play in our cognition, three significant features of concepts should be discussed in brief. These features do not exhaust the features and functions that psychologists and other cognitive scientists associate with concepts in cognition. However, these three features form the basis for the importance of concepts in making cognition possible at all. As we have

seen, concepts enable many of the central functions of cognition in addition to providing a mechanism by which the brain attempts to balance the need for information in cognition with the real limitations of memory and processing capacity as well as time. (Murphy, 2004) Concepts promote cognitive economy, inferences give emphasis on the real limitations of information and the complexity of information humans can process in both formulating and evaluating conscious inferences.

Concepts facilitate cognition by allowing us to think of an object, property, event, or relationship in terms of general classes, with the help of concepts a person can think about an individual object, property, event, or relation in a manner that abstracts away from much of the details of that specific individual. (C.Wallis, 2015) Concepts help to decrease the amount of information regarding that individual one must process when one perceives, learns, remembers, communicates, decides or reasons. For example, if someone tells you that he owns a dog you gain a significant amount of information. We know that he own a four-legged domesticated animal descending from wolves or foxes and commonly owned as pets. Again at the same time you can infer that it barks, eats meat, wags tail etc but there is still great deal of information left which you still do not possess. You don't know the sex, size, age, weight, breed etc of that particular dog owned by him, a little information about that pet might be useful but his sleeping time, and food habits, etc serve no useful purpose for you so you might not get interested in conversation. What holds true about information regarding that pet dog also holds true for information regarding one's experiences of dogs in general. (A.K.Warden, 1971) When a person interacts with the world, he ideally wants to do so in a manner that utilizes a relatively small but highly relevant set of information. One important function of concepts and categories lies in the management of information because it helps to facilitate a balance between the amount and complexity of information and the limitations of both

conscious and unconscious resources, the use of concepts facilitates quick categorization allowing one to perceive, learn, communicate, remember, or decide efficiently by drawing upon a manageable amount of highly relevant information.

Concepts provide a situation with a general classification of objects, properties, events, or relations together with ready access to a manageable amount of highly relevant information for interacting with objects of that type. By allowing one to think about objects, properties, events, or relations using a manageable and relevant set of information, concepts allow a person to exploit one's limited conscious working memory so as to think more effectively. Concepts allows a person to think of the world in more general terms thereby focusing one's mind on a smaller, more manageable, and highly relevant set of information. This balancing act between too much or too complex information and too little or irrelevant information does not always optimize cognition but it proves necessary to effective cognition. (E Margolis, 1999). Concepts also provide the basic element with which one encodes, organizes, and retrieves our knowledge about the people and the world. For example, suppose someone ask you to tell about what you know about Triticum, you might tell that you do not know anything or you might read about it on internet. On the other hand, if the same person asks you to tell him about wheat, you would have no difficulty in recalling that it is the seeds from which we get flour and thereby potentially gain access to all your knowledge and uses regarding that substance. You might realize, or search and discover that Triticum is scientific name for wheat, once you experience this you will likely to remember this scientific name for wheat. Since one's concept serve as the means by which one gets a hold of the world and through which one encodes, and organizes one's knowledge of the world, one's ability to properly categorize one's experience affects one's ability to access relevant knowledge and make appropriate inferences. So, like the terms in our language, concepts have an intentional meaning and an

extensional meaning. They get these meanings because, like terms, concepts are really just bits of the world that we use to refer to other bits of the world. In the case of concepts, one can identify two sorts of intentional meaning; the information guiding one during categorization that is when one conceptualizes an object, property, event, or relation and the larger body of information encoded, organized, and retrieved through one's concepts. Likewise, concepts, like terms, have an extensional meaning consisting of the objects, properties, events, or relations one rightly or wrongly subsumes under the category.

Concepts allows one to bring our past experiences to present concerns, the Greek philosopher Plato (427 BCE - 355 BCE) thought that knowledge comes from identifying and exploiting the constancies in experience amidst the many changes. (FODOR, 1998) Concepts can allow one to interact with the world in a way that allows one to focus upon important similarities between objects, properties, events, and/or relations. Naturally, concepts do not infallibly achieve this goal, but they provide a mechanism by which one can think about the world effectively. Indeed, the act of conceptualization and categorization is an implicative inference. Whenever one exploits one's conceptual knowledge of a class of things through categorization one makes an inductive inference one infers that the particular item falls into the class picked out by that concept. Likewise, one can exploit that categorization inference by inferring that the regularities encoded by the concept hold for that particular item and generally, for all or many instances one will encounter in the future. Thus, when one uses a bottle to drink water, one supposes that it is the same sort of object one has used in the past, and hence it will serve that function now. When one recognizes the object as a spoon, one supposes that the information that guided one in past categorizations of objects as spoons applies in the current case as well. Whenever one supposes that certain objects, properties, events, or relations form a class and starts to employ that distinction to categorize other objects, properties, events, or relations,

one begins the processes of concept formation. Sometimes one's concepts work well for categorizing objects, properties, events, or relations. When one's concept allows one to encode, organize, and retrieve information about that class so as to better interact with world concepts do their jobs. The field of psychology concerned with the study of cognition is known as cognitive psychology. One of the earliest definitions of cognition was presented in the first textbook on cognitive psychology published in 1967. According to Neisser, cognition is "those processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used. (E Margolis, 1999)

Concepts, which partly correspond to the words in spoken and written language, are an important kind of mental representation. There are computational and psychological reasons for abandoning the classical view that concepts have strict definitions. Instead, concepts can be viewed as sets of typical features. Concept application is then a matter of getting an approximate match between concepts and the world. Schemas and scripts are more complex than concepts that correspond to words, but they are similar in that they consist of bundles of features that can be matched and applied to new situations. People cannot provide definitions for most of the concepts they use; this suggests that knowing a concept and being able to use it competently do not require knowing a definition. However, when trying to define a term, people mention properties that are indeed closely associated with the concept. One proposal, therefore, is that your knowledge specifies what is typical for each concept, rather than naming properties that are truly definitive for the concept. Concepts based on typicality will have a family resemblance structure, with different category members sharing features but with no features being shared by the entire group. Concepts may be represented in the mind via prototypes, with each prototype representing what is most typical for that category. This implies that categories will have graded membership, and many results

are consistent with this prediction. The results converge in identifying some category members as “better” members of the category.

Psychological concepts are generally understood as being the constituents of thought or as Locke states, they are the “materials of reason and knowledge.” They are the basic units of the human understanding. For example, my judgment CHEATING IS WRONG is made up of three individual concepts: CHEATING, IS, and WRONG. Also, concepts are understood as being mental representations or bodies of knowledge that are stored in long term memory and are functionally used in most of the higher cognitive competences, where the relevant competences are such things as categorization, induction, deduction, concept combination, and planning concepts, principles, and rules provide a means to solve new problems in situations that we may never have previously encountered. Concepts that may appear complex in some applications (e.g., mathematical equations for conservation of energy) are nevertheless usually reducible to some simple relationship such as identity or equivalence. A child's cognitive development has been thought to progress through stages in which, among other things, the basic identity concept is progressively expanded to include equivalence (conservation) of substance (e.g., matching lumps of clay), length (e.g., matching lines), number (e.g., matching equal numbers irrespective of spatial distribution), and volume (e.g., matching volumes irrespective of containers' dimensions) Like language, concept learning is an ability in which humans traditionally have been thought to be intellectually superior and unique relative to other.

4.3 DISCUSSION:

The term cognition is used in various ways to refer us for different aspects, like processing of information, applying knowledge and changing preferences. Cognition or cognitive processes can be natural and artificial, conscious and not conscious. They are analyzed from

different perspectives and in different contexts. The concept of cognition is closely related to such abstract concepts as mind, reasoning, perception, intelligence, learning, and many others that describe numerous capabilities of human mind and expected properties Cognition is an abstract property of human beings and it is studied as a direct property of brain. Concepts promote cognitive economy and the inferences give emphasis on the real limitations of information and the complexity of information, humans can process both formulating and evaluating conscious inferences.

CHAPTER - 5

CONCEPT FORMATION

INTRODUCTION:

Concepts are constructed as mental particulars. By whatever features, characteristics, signs or summarized descriptions there is a concept of the body of feelings that is in a living being, and in everyday language. In the absence of these features there would be no contact discerned between the resistance that is the matter and the body of sentience. A concept can be said as a technique or a device for making something understood. Occurrences of concept in the sutrapitaka tend to suggest that it is more or less synonymous with a series of terms meaning linguistic conventions of everyday language. (R.M.Gagne, 1965) Thus the different types of living beings are agreed usages in the world. Learning a concept is understood as learning to token a new representation of a property. This new representation is a new vehicle with a new content that is precisely a new concept. Concepts have possession conditions here a possession condition can be described as an ability or set of abilities that the subject has in virtue of possessing a concept. For example, the concept "YELLOW", possessing the concept gives us certain abilities and these abilities are mentioned in the possession condition for the colour yellow. The possession condition for the concept yellow might describe the ability to use that concept in inferences, or to discriminate yellow things in one's visual field, or both.

5.1 HOW THE CONCEPTS ARE FORMED?

Concepts are formed in two ways according to the typical characteristics of its members that is prototype model and according to its defining properties that is classical model. On the other hand, the Prototype model defines a concept according to the general characteristics of its members and the classical theory clearly defines a triangle as a geometric shape with three sides and three similar angles. . The prototype model is useful when not all the members share the same characteristics, only similar ones. (Murphy, 2004) For example, it is often difficult to think of whales and bats as mammals because most mammals walk on land. However, all of them have mammary glands, have fur, and they don't lay eggs.

Concepts are the categorization of events and objects or people that share common properties. We are able to organize complex notions into simpler and therefore more easily usable forms by using concepts. The process by which we learn to form classes of things, event, people, and so on is called concept formation. In our daily life concept formation is essential for the interactions with the not only objects but also people and abstract ideas. Concept formation is complex cognitive phenomenon which has been only partially modelled in Cognitive Psychology.

Why is it useful for an agent or organism to form concepts? Concepts are derived from individual instances but are not confined in their application to just those instances; they can be applied to classify novel objects and events. The process of concept formation is the process of learning about and encoding invariant properties shared by a set of objects or events in the world. An agent with an ability to form concepts would therefore gain in efficiency in interacting with its environment. Concepts enhance the efficiency of cognitive processes related to perception, language understanding, action, planning, etc.

The combination of representations and memory (storage system) increases flexibility in behaviour which enhances performance and the ability to adapt to an environment. (C.Wallis, 2015) Accordingly, concept formation and use is part of an agent's survival strategy: A proposition that has very important consequences on how meaning is assigned to concept.

We will look for different approaches of how it is formed? The information processing approach attempts to answer only part of the question: How are similarities and differences between objects and events in the world identified, abstracted and encoded for classification of subsequent instances of similar objects and events? For example, how do we acquire the concept for trees and use it to recognise different trees that we have never seen before. From the information processing point of view concepts are assigned meanings which are assumed to correspond to information in the world. That is, the state of affairs in the world determines the nature of representation, even if the world contains information, it is not much use as far are its representation is concerned, and arbitrary assignment of semantic values is fine as long as it is consistent. In order to construct concepts to represent invariant properties shared by similar objects in the world one needs to know about the correspondence between concepts and the properties they are to represent. But that knowledge of correspondence is only available after the relevant concept has been formed. (F.Castellano, 2018) In other words, a concept cannot be formed unless it already exists. Without motivating its semantics independent of the encodings of invariant properties it would be difficult to have concepts corresponding to objects and events in the world. Psychological models provide a better account of emergent phenomena as an outcome of agent-environment interaction. A detailed account of the cognitive processes involved is not possible without a better understanding of the interaction between behaviour and cognition concepts have fixed semantics and operate in a strictly deterministic, non-dynamic systems

still leaves them without a satisfactory account of how semantic values are assigned to features and concepts .Dynamic cognitive processes such as concept formation are modelled as part of complete reality. These processes are not seen as formal syntactic phenomena confined to an abstract symbolic level detached from the rest of agents' sensory and affective systems. If information is actively (subjectively) constructed from data of the world then the agent's cognitive processes, no matter how high level or abstract or symbolic, must be affected to some degree by the manner in which the data is interpreted Perception of data is determined by appropriate visual-spatial sensors e.g., auditory or the organs by which smell is perceived, also play an important role in concept formation. Since it is assumed that concepts play an important role in the functioning of an agent, any account of them must also give an account of the relationship between concepts and sensory-motor effectors individual concepts are not independent of each other; the meaning of a concept is necessarily dependent on the meaning of other concepts above.

Concepts are not well-defined entities in themselves. They are not independent from one another, they are also formed on the basis of less complex observations, experiences, or even simple associations. Meaning of representations is not independent of it effect and affect on behaviour. The relationship between sensory-motor data from the environment and internal representations of concepts needs to be taken into account because it serves to determine (ground) their semantic values and helps define their role in cognition in terms of other concepts. This can be achieved by a systematic investigation of the process of simple concept formation. The learning procedures help the agent to build up internal representations of objects, events and plans; this structuring of the environmental data based on the data of internal feedback comprises a dynamic construction process necessary for basic cognitive tasks such as pattern recognition, generalisation, abstraction and concept formations. The relationship between sensors and

effectors, as mediated by internally represented concepts are explored. The study of induction, then, is the study of how knowledge is modified through use. It is an inferential process that expands knowledge in the face of uncertainty. In this process, probabilistic and statistical inferences are highly relevant. Inferential processes are characterised as a process of search through a state space that has an initial state, one or more goals, and a set of operators that can transform one state into another induction is, directed by problem-solving activity, and, based on feedback regarding the success or failure of predictions generated by the system. Nevertheless, in our opinion this characterisation of problem solving behaviour is still confined to a relatively abstract symbolic cognitive level. It treats cognitive processes as some sort of functions or rules that operate over representation in order to develop autonomous agents capable of flexible and adaptive behaviour the focus has to be on inductive processes based on experiences by interacting with the environment that have internal semantics rather than abstraction such as syntactic structures. So emergent behaviour and concepts are matched with internal states and semantic values determined by past experience of the agent. Once the internal semantics are learned they are expected to play a greater role in constructing information from subsequent incoming data.

The conceptual systems of individual humans are profoundly marked by their experiences from maternal vocalization while still in the womb to experience with culture-specific artefacts like baseball, chairs, and religious practices. Evidence for relativistic effects of language on conceptual categories shows how conceptual systems are shaped by linguistic and other cultural experience. A coherent and plausible picture of human concept learning is arising from combining biological, behavioural, computational, and linguistic insights. There is indeed an internal foundation for our concepts and it is us. We have a wide range of perceptual, motor, emotional, and social capabilities all

expressed in our neural circuitry. This neural circuitry forms the basis for primitive concepts, which are grounded in these structures. Furthermore, we have considerable competence at combining existing concepts to achieve desired goals through binding, conjunction, and analogy, among other mechanisms Words express concepts and evoke them in the listener. Much of conscious internal thought appears to be self-talk and, as we will point out, there are many well established findings relating words and mental concepts. Experiments based on the unified approach to conceptual structure reveal that using concepts accessing their features, imagining them, recalling them, and processing language about them makes extensive use of their perceptual, motor, social, and affective substrates.

5.2 USES OF CONCEPT:

We use concepts in every aspect of our life, whether in performing categorization tasks, processing language about concepts, or reflecting on their features, we use mental simulation the internal creation or recreation of perceptual, motor, and affective experiences. The notion that mental access to concepts is based on the internal recreation of previous embodied experiences is supported by recent brain research, showing that motor and pre motor cortex areas associated with specific body parts (i.e. the hand, leg, and mouth) become active in response to motor language referring to those body parts. Conceptual processes make use of the internal execution of imagery, qualitatively similar to the past experiences it is created or recreated from. As such, using concepts is qualitatively similar in some ways to experiencing the real-world scenarios they are built from. It is important to note that motor and perceptual experiences hold a privileged position in the study of mental simulation only because their basic mechanisms and neural substrates are relatively well understood. Existing concepts are used to produce novel ones through composition mechanisms like:

conjunction; modification abstraction and mapping among others. These productive mechanisms can function through direct perceptual or motor experience but language can also indirectly ground conceptual learning.

Language drives perceptual, motor, and affective simulation. This simulation is experience, that itself can form the basis for new concepts. In fact, because of the brain's massive connectivity and spreading activation, concepts are never learned or activated in isolation - each of us has a rich structure of interrelated concepts. We are also continuously composing or "blending" concepts. Our core concepts are based on the neural embodiment of all our sensory, motor, planning, emotional, social, etc. abilities, most of which we share with other primates. This is a huge, but not unbounded, collection of primitives. We can only be aware of or talk about a limited range of parameters over these abilities and human languages are based on these parameterizations, plus composition. Composition can give rise to additional abilities and parameters. The meanings of all new words and concepts are formed by compositions of previously known concepts. We use a wide range of compositional operations including conjunction, causal links, abstraction, analogy, metaphor, etc. Domain relations, particularly conceptual metaphors, are the central compositional operations that allow us to learn technical and other abstract concepts. We understand language by mapping it to our accumulated experience and imagining (simulating) the consequences. When one examines the experimental literature on "concept formation," "concept-learning," and related matters, it appears that here too the word "concept" is not being used with great consistency what does "learning a concept"? if there can be agreement on what a concept is, and on how it is typically acquired in practice, then it will be possible to design experimental studies to find out the effects on its learning of various conditions of the learning situation There are at least two different, important kinds of phenomena commonly referred

to as concept-learning. One refers to the acquiring of a common response, often a name, to a class of objects varying in appearance. This may best be called concept-learning. The second refers to the combining of concepts into entities variously referred to as "ideas, "facts," "principles," or "rules." (Denis mareschal, 2010)

This principle-learning is an example of these two different kinds of capabilities can perhaps be illustrated by number. First of all, there are such things as number concepts. When a young child is able to correctly assign the name "three" to collections of any three objects, and at the same time not assign it to collections of two or four objects, it may be said that the child has learned the concept. The basic reason for the distinction between concept and principle is that they represent two different kinds of learned capabilities. In the first case, the criterion performance is simply being able to answer such a question as "Which of these collections of objects is three?" In the second case, the criterion performance is being able to use the concept three in combination, as in the question "What number added to two will give three?" These are quite different performances. Obviously, a child who is able to do the first may not have learned to do the second.

How is a concept learned? What are the conditions that need to obtain in the instructional situation in order for a new concept to be acquired? Researchers identified three stages of concept learning the sensorial, the perceptual and the conceptual stage. Sensations are stimuli impinging on the senses that cannot be retained by man's memory, nor can be experienced in pure isolation. They are always experienced together with other sensations in the automatically integrated whole that is calls perception. (E.Rast, 2018) This automatic integration is performed by our sub consciousness. The last step is a conscious, volitional integration of these precepts by our focused consciousness, yielding concepts. The description of the process makes notice of the first stage as being aware of objects, to which the concept is ascribed

entity, followed by the closely allied stage in which a child detects specific, particular things which is ascribed as the concept identity. Then goes on by ascribing the concept unit to the third stage, in which objects with similar traits are grouped, and abstracted by their essential, distinguishing characteristic. Other researches show that awareness of objects should be replaced by awareness of an external reality, linking entities not to the sensorial stage, but to the perceptual stage, and assuming that identity is an implicit relationship between existence and consciousness, to be found in all stages sensations as the primary awareness of an external reality, not of entities, perceptions as the awareness of the mere existence of these entities, without further specifications, and conceptions as knowledge about specificities that go beyond the awareness of the mere existence of things, distinguished from one another. Implicit in every concept and even in every percept and sensation is the awareness of an external reality. Even before a child knows that things exist, as being separate from other things, it experiences how at least something and not something impinges on his senses. In this stage, there is no abstraction. The main activity of the brain consists in trying to connect the perceived sensations into shapes. The moment where a contrast between a shape and its background is experienced, things get discerned from one another. That is where stage two begins; Stage two is the stage of perception, which is not the same as conscious, conceptual identification. (Denis mareschal, 2010) Perception is the subconscious awareness of the fact that objects exist, without knowing their specific attributes: being aware that something exists, is not the same as knowing how something exists, what its specificities are. The activity of the brain still largely consists in discerning objects from one another. The moment where similarities are discovered between those objects, enabling the subject to group them according to a distinguishing feature, is where stage three begins. The conceptual stage is the stage where entities are being abstracted by retaining the essential, fundamental characteristic, while omitting all accidental, non-fundamental characteristics. The result is a concept: a mental integration of two or more units possessing the same

distinguishing characteristic, with their particular measurements omitted. The removal of these non-fundamental characteristics does not mean that they cease to exist in a metaphysical way. They are only disregarded when forming the concept. The Harlow's monkeys acquired the concept "odd" when they had learned to choose the odd one of any three objects presented, two of which was nearly identical. If two identical cubes and a sphere were presented, they would choose the sphere; if two boxes and a stick were presented, they would choose the stick. It is instructive to note that what the monkeys learned was the capability of choosing an "odd" one, regardless of the physical appearances of the objects presented. They learned to respond to a class of situations which the experimenter could classify as odd it contained. Human beings, too, can learn concepts this same way. (R.M.Gagne, 1965) It is almost bound to be true that the process of concept-learning gets shortened by human beings. Language is one thing that operates to bring this about. Suppose the concepts "liquid" and "solid" are to be taught to a young child. It seems likely that the learning situation would be something like the following:

1. Show a child, a glass having water and a glass with rock in it. Say "This is a solid" and "This is a liquid."

2. using a different container, show him some powdered substance in a container and some milk in another container. Say "This is a solid; this is a liquid."

3. Provide a third example of solid and liquid, using different materials and containers.

4. Show the child a number of examples of liquids and solid which he has not seen before. Ask him to distinguish the liquids and the solids. The characteristics of this learning activity are, first, several varieties of the class, of varying physical appearance, were used to exemplify the class to be responded to. Second, words already familiar as responses were used to guide the learning. Under such circumstances, one might expect a child to learn an adequate set of concepts of "liquid" and "solid." (R.M.Gagne, 1965) This is tested by asking the

child to identify liquids and solids from a set that he has not seen before and that has not been used in the learning. It is also important to note two things that were not present in this situation. First, this is not repeated trial-and-error learning. Only three examples are used, all different. The situation is not repeated identically over and over again. Second, although there is language here, it is by no means extensive. One has not tried to teach the concepts, for example, by making such verbal statements as "A liquid is a substance whose particles move freely over each other so that it’s mass assumes the shape of the container in which it is placed." This characteristic of a liquid is directly exhibited, rather than being verbally described what is meant by learning a principle or rule and how does this differ from learning concepts? Principles, being combinations, can become very complex. We are taking an example of an extremely simple one such as "liquids pour."

What kind of learning situation would be set up to bring about the learning of such a principle? Actually, there is two possibilities Possibility one is this: After determining that the concepts 'liquid “and "pour" can be identified, make the statement that 'liquids pour."To test the learning, give the student a liquid in a container, and say, in effect, "Show me." This technique is what is often called reception learning Possibility two is this: First determine that the concepts "liquid" and "pour" can be identified. Then, give the student a number of different liquids in a number of different containers. Ask him to demonstrate ways in which the liquids are alike and different from solids. One thing he will do is pour them; he may also make the verbal statement, "Liquids pour." This learning technique is called discovery learning the important thing to note is that what is learned is a combination of concepts, called a principle. The characteristics of the learning situation for principles are, first, that the concepts of which it is composed must be previously learned. Second, the principle is either stated verbally or discovered by the learner when people are verbally sophisticated; they

often learn concepts verbally, as pointed out by J. B. Carroll. That is to say, individuals learn concepts by definition If a person does not know the concept "rust" he may learn what it is by reading or hearing the verbal statement, "a crust of hydrated iron oxide, H2O, oxide hydroxide, and Fe(OH)3. It is important to note that in this kind of learning situation, a principle is being used to provide instruction for the learning of a concept. The verbal statement itself is obviously a principle, because it contains several concepts like hydrated iron oxide, H2O, oxide hydroxide and Fe(OH)3. And just as obviously, the learner will not be able to acquire "rust" as a concept unless he does indeed know what each of these other concepts means, that is, unless he has previously learned each of them, many new concepts are learned in this verbal manner by literate students and adults. A concept that is learned by way of verbally stated principles may have some inadequacies. For example, if an individual see rust for the first time in his life after hearing a verbal definition of it, will he make a certain identification of this material? Or will he be somewhat hesitant about it, and tend to confuse it with something else? Nothing can quite take the place of actually observing it. It is, for example, a fundamental reason why science educators are so firmly convinced of the value of the laboratory. If the student wants to learn concepts like "power," "energy," "osmotic pressure," and many others, he can, learn them in some sense by means of definition. The role of the laboratory in school learning serves to remind us of the concrete basis for learning concepts and of the potential insufficiencies of concept-learning which is based solely upon verbally conveyed definitions. Different conditions are applicable to the learning of concepts and the learning of principles the first is that concepts are prior to principles and, in this sense, are simpler than principles. To learn a principle, one must have previously learned the concepts of which it is composed.

5.3 DISCUSSION:

Concepts are very useful to us. It can influence and determine our behaviour. Concepts are acquired as properties to recognize perceived objects as categories. It is discussed that concept learning is a strategy which helps to compare and contrast groups or categories that contain concept-relevant features with groups or categories. Formation of Concepts also helps in generalizing our information.

CHAPTER - 6

THEORIES OF CONCEPT

INTRODUCTION:

Most theories of concepts treat lexical concepts as structured complexes. In the Containment Model, a concept is a structured complex of other concepts. In this model, a concept A might be composed of concepts like C, D, and E. As concept A has C, D, and E elements, then occurrence of A would necessary involve occurrence of C, D, and E.

The second view, which is of inferential model, is different from the former one. According to this view, one concept is a structured compiled of other concepts. In this model, even though, C, D, and E are parts of the structure of A it can still occur without the occurrence of C, D, and E. The significance of these distinctions of concepts will become clearer when we will go through some specific theories of concepts. For understanding concepts in wider view we have to know the theories of concepts, it is a focal point for demarcating different approaches to the mind and even worldview.

The theory of concepts has been one of the most active areas of research in both philosophy and psychology in the past fifty years. We will now try to look at the different theories of concept and try to understand how the theories justify Concepts.

6.1 CLASSICAL VIEW OF CONCEPT:

It can be said that, most theories of concept are reactions or developments of the Classical Theory of concepts. This theory has the most concepts especially lexical concepts – have definitional structure. Example- the concept BIRD , according to classical theory, we can

think of this concept as a complex mental representations that satisfies the condition for being BIRD , so BIRD might be composed of set of representations such as have wings , sings , lays eggs, beak , colours etc . Each of these components specifies the condition that something must fulfil the above features to be a bird, and anything that satisfy them all thereby counts as birds. On the Classical Theory, most concepts have lexical concepts which are complex representations that are composed of structurally simpler representations. This theory justifies the containment model of concepts where the complex concepts are among its proper parts. This is the single theory which all classical theorists subscribe. Historical predominance of classical theory cannot be overstated, aspects of this theory date back to antiquity. The first challenges to this theory are dated from the 1950s. This Theory held high regards because of its powerful explanatory resources, unified accounts of concept acquisition, categorization, clear justification, analytic entailment and reference determination. The Classical Model is one of the earliest and the most basic, rigid and limited in scope. It assumes clear boundaries between concepts and a hierarchical structure to represent relationships between concepts. The nature and function of features determine the clarity of boundaries between concepts. This formal account of concepts, perhaps good model of human competence, fails to predict a large portion of psychological data. For example, there is evidence to suggests that concepts are not very clearly defined in practise, and that some concepts seem to have a more central (or basic) role than others thus upsetting the notion of a hierarchical representational structure. This class of concepts are regarded as equivalent of natural categories though that has not proved particularly insightful as far as our understanding of the nature and role of concepts in cognition is concerned. Further, instantiated members of a concept are not considered to be equal; some members are regarded as more typical than others. A probabilistic based model assigns different saliency (or weight) to features between and within sets defining concepts. This, coupled with a threshold based decision procedure, gives a more

realistic account of the role of concept in cognitive processes and human behaviour. Exemplar based models are an alternative attempt at overcoming the limitations of the basic classical model These models predict that concepts are defined by exemplars which if properly defined can determine gradations in, and typicality of, membership . Subsequent work in this field has concentrated on providing better accounts of how concepts are used in cognitive processing. This includes designing a better, that is, more reliable and flexible membership decision procedure. The classical Theory holds that most concepts, especially lexical concepts, have definitional structure. What this means is that most concepts encode necessary and sufficient conditions for their own application. What we call the Classical Theory of concepts is an idealized account that abstracts away from many of their differences. To mention just one point on which classical theorists disagree: Many recent classical theorists have abandoned the strict empiricist view that concepts are ultimately composed of features expressing sensory properties. The early psychological approaches to concepts took a definitional approach. There are two aspects to a definition that these items illustrate. The first we can call necessity. The parts of the definition must be in the entity, or else it is not a member of the category. Similarly, if something doesn't have a distinctive attribute of chairs, it is not a chair. The second aspect we can call sufficiency. If something has all the parts mentioned in the definition, then it must be a member of the category. The pervasiveness of the idea of definitions was so impressive that Smith and Medin (1981) dubbed it the classical view of concepts. Here, then are the main claims of the classical view. Firstly, we can understand concept as mentally represented by definitions. A definition provides characteristics that are necessary and jointly sufficient for membership in the category. Second, the classical view argues that every object is either in or not in the category, with no in-between cases. This aspect of definition was an important part of the philosophical background of the classical view. Third, the classical view does not make any difference between it's' category members. Anything that meets the

definition is just as good a category member as anything else Aristotle emphasized this aspect of categories in particular. An animal that has the feature common to all dogs is thereby a dog, just the same as any other thing that has that feature. In a real sense, the definition is the concept according to the classical view. So all things that meet the definition are perfectly good members of the concept, and all things that do not fit the definition are equally ‘‘bad’’ members (i.e., non-members) of the concept, because there is nothing besides the definition that could distinguish these things. One general problem is that the rules and ideas suggested by the classical view do not seem to be characteristic of human concepts. The notion of a definition implies that category membership can be discretely determined: The definition will pick out all the category members and none of the non-members. Furthermore, there is no need to make further distinctions among the members or among the non-members. In real life, however, there are many things that are not clearly in or out of a category. For example, many people express uncertainty about whether a tomato is a vegetable or a fruit. The changes in subjects’ decisions do not reflect an overall inconsistency or lack of attention, but an uncertainty about the borderline members. In short, many concepts are not clear-cut. There are some items that one cannot make up one’s mind about or that seem to be ‘‘kind of’’ members. A tomato is ‘‘kind of a vegetable,’’ even if it is not wholeheartedly a vegetable. The classical view has difficulty explaining this state of affairs; certainly, it did not predict it. Another problem for the classical view has been the number of demonstrations of typicality effects. The classical view does not have any way of distinguishing typical and atypical category members. Since all the items in the category have met the definition criteria, all are category members.

When people learn artificial categories, they tend to learn the typical items before the atypical ones. Furthermore, learning is faster if subjects are taught on mostly typical items than if they are taught on

atypical items. Thus, typicality is not just a feeling that people have about some items, it is important to the initial learning of the category in a number of respects. the explanations of typicality structure, there is a very good reason for typicality to have these influences on learning. Learning is not the end of the influence, however. Typical items are more useful for inferences about category members. We can say that whenever a task requires someone to relate an item to a category, the item's typicality influences performance. This kind of result is extremely robust. In fact, if one compares different category members and does not find an effect of typicality, it suggests that there is something wrong with it about the experiment. It is unfortunate for the classical view, therefore, that it does not predict the most prevalent result in the field. Even if it is not specifically disproved by typicality effects, it is a great shortcoming that the view does not actually explain why and how they come about, since these effects are ubiquitous. As a result of the theoretical arguments and the considerable evidence against the classical view, a number of writers have tried to revise it so that it can handle the typicality data and unclear members although concepts do have definitions; people have also learned other things about them that are not definitional. This kind of information helps us to identify category members or to use information that is not defining. For example, not all dogs have fur, so having fur cannot be part of the definition of the dog category. However, it is still useful to use fur as a way of identifying dogs, because so many of them do have it. Thus, ‘‘fur’’ would be part of the identification procedure by which we tell what actual dogs are, but it would not be part of the concept core, which contains only the definition. One could call ‘‘fur’’ a characteristic feature, since it is generally true of dogs even if not always true: Characteristically, dogs have fur. This revised view, the effects of typicality result from the identification procedures, whereas certain other behaviours (primarily categorization decisions) depend primarily on the concept core.

A theoretical problem with the revised classical view is that the concept core does not in general appear to be an important part of the concept, in spite of its name and theoretical intention as representing the ‘‘real’’ concept. As mentioned earlier, almost every conceptual task has shown that there are unclear examples and variation in typicality of category members. Because the concept core does not allow such variation, all these tasks must be explained primarily by reference to the identification procedure and characteristic features. So, if it takes longer to verify that a Hen is a bird than that a Eagle is a bird, this cannot be explained by the concept core, since Hen and eagle equally possess the core properties of birds, according to this view. Instead, Hen and eagle differ in characteristic features, such as their size and ability to fly. Thus, judgments must not be relying on the category core. When this reasoning is applied to all the tasks that show such typicality effects, including category learning, rating tasks, language production and comprehension, vocabulary learning, and category-based induction, the concept core is simply not explaining most of the data. As a result, most researchers have argued that the concept core can simply be done away with, without any loss in the ability to explain the results. It has been extremely difficult to find definitions for most natural categories, and even harder to find definitions that are plausible psychological representations that people of all ages would be likely to use. Second, the phenomena of typicality and unclear membership are both unpredictable by the classical view. It must be augmented with other assumptions which are exactly the assumptions of the non classical theories to explain these things. Third, the existence of growing category decisions that car seats are chairs; chairs are furniture; but car seats are not furniture is very difficult to explain with the help of the classical view. The classical view has not predicted many other phenomena of considerable interest in the field such as exemplar effects, base rate neglect, the existence of a basic level of categorization, the order in which children acquire words, and so on. In some cases, it is very difficult to see how to adapt this view to be

consistent with those effects. In summary, the classical core has very little to do, as most of the interesting and robust effects in the field cannot be explained by cores but must refer to the characteristic features, it is true for careful categorizations done without time constraints. To be able to identify concepts through definitions of sufficient and necessary properties is an elegant way of categorizing the world, and it avoids a lot of sloppiness that comes about through prototype concepts. There is no specific theory of concept representation that is based on the classical view at the time of this writing, even though there are a number of writers who profess to believe in this view. The most popular theories of concepts are based on prototype or exemplar theories that are strongly neoclassical.

The views of Aristotle claim that categories are separate entities which are characterized by a set of properties, shared by their members. These are supposed to establish the conditions which are both important and sufficient to capture meaning. This is called the classical view. According to the classical view, categories should be clearly defined, mutually exclusive, and collectively exhaustive. This way, any entity of the given classification, belongs indisputable to one and only one of the proposed categories. Concepts provide one with a means of thinking about individual properties, objects events or relations as instances of some class of things. In other words, concepts facilitate categorization allowing one to treat various objects, properties, events, or relations as instances of a class, the members of which share various features. Early work on concepts focuses primarily upon concepts of concrete objects and how humans categorize such concrete objects. The first theory psychologists explore is the classical Theory among philosophers: Concepts gives us a definitional understanding of the conceptualized objects. In short, we can express the meaning of our concepts by formulating a definition. In fact, one of the attractive features of the classical theory of concepts lies in the potential of the theory to connect concepts with language. On the classical view, our

words and our concepts both get their meanings through a definitional understanding. Thus, on the classical view of concepts, every word simply corresponds to the concept that that word signifies. The classical theory of concepts also has a nice advantage when it comes to conceptual knowledge: concepts showing the individually necessary and jointly sufficient conditions give us a formula for picking out all and only objects that fall into the category. Indeed, the classical view equates possession of a concept with possession of a perfect definition, i.e., expressing the essential nature of the conceptualized objects. Such definitions provide us with the individually necessary and jointly sufficient conditions for an object, property, event, or relation to count as an instance of the concept. Individually necessary conditions specify the features that an item must have in order to count as an instance of the concept. Jointly sufficient conditions specify the features that together prove adequate for an item to be an instance of a concept. Thus, another attractive feature of the classical view lies in the nature of the insight into the conceptualized objects that a concept provides under the classical view. Indeed, on the classical view possessing a concept gives us a complete handle on the object. Concepts that specify individually necessary and jointly sufficient conditions provide one with a formula for picking out all and only objects that fall under the category. Some concepts seem to exhibit the features proposed by the classic view. For example, concepts like grandfather and father seem to capture the individually necessary and jointly sufficient conditions of being a grandfather or father. A grandfather is the father of one of your parents. Likewise, geometrical and mathematical concepts seem to provide one with a means of picking out all and only the instances of that concept. Triangles just are closed three-sided planar figures. All triangles must have the three-sides forming a closed figure on a plane this is the necessary conditions. Likewise, a figure that is closed three-sided planar figure has all the features required to count as an instance of a triangle the sufficient conditions.

The classical theory offers an equally compelling model of categorization. The criticisms of classical theory are there are few examples of defined concepts, the problem of psychological reality, the problem of ignorance and error, the problem of conceptual fuzziness, and the problem of typicality effects.

6.2 PROTOTYPE THEORY OF CONCEPT:

During the 1970s a new view of concept that emerged as alternative to the classical theory. It tries to accommodate the psychological data that had proved to be damaging to the Classical Theory, that bring the downfall of classical theory. To account for typicality ratings psychological researchers like Rosch adopt theories that later researchers call the similarity/probability view. The common idea of similarity/probability theories lies in their hypothesis that people represent concepts, not as definitions, but as lists of features.

Typicality effects arise, on the similarity/probability view, because in categorization people compare the item to their stored representation of a concept's features, judging conceptual membership on the basis of similarity between the item and the concept measured in terms of these features. When one understands concepts as weighted lists of features, concepts naturally become fuzzy, introducing a certain degree of vagueness. Categorization based upon similarity between the item and the concept as measured by the number of shared features naturally results in typicality effects. Prototype theory provides a concrete example of a similarity-based theory of concepts. Prototype theory likewise illustrates the phenomena of typicality and how concepts and concept-driven categorization differ from definitions and definition-driven categorization. Prototype theory presumes people extract a representation of the central tendency from a collection of objects. That is, the person forms an abstract representation of the class of objects, properties, events, or relations encompassed by the concept. The

abstract representation acts like a list of perceptually salient features common to many but not all instances of the concept. Researchers call such representations of a class through a weighted set of typical features prototypes. One classifies an item as an instance of a concept (a prototype) if that item proves sufficiently similar, where similarity consists in the number of features that the concept (the prototype) and the item share the more features an item and a concept share, the quicker the items meets the minimal level of similarity and the item qualifies as an instance of the concept. One of the main critics of the classical view of concepts was Eleanor Rosch, who provided much of the crucial evidence that revealed the shortcomings of a definitional approach to concepts. Rosch's writings also provided the basis for a number of the early alternatives to the classical view, all under the rubric of the prototype view. Although the items in the extension of a concept tend to have these properties, for any given feature and the property it expresses, there may be items in the extension of a concept that fail to instantiate the property. Thus the features of a concept aren't taken to be necessary as they were on the Classical Theory. In addition, the Classical Theory characterized sufficient conditions for concept's application in terms of the satisfaction of a concept's entire feature. For Rosch and Mervis, a word or concept like GAME isn't governed by a definition but rather by a possibly open-ended set of properties which may occur in different arrangements. Some games have these properties, some have those, but despite this variation, the properties of games overlap in a way that establishes a similarity space. What makes something a game is that it falls within the boundaries of this space, because the Prototype Theory relaxes the constraints that the Classical Theory imposes on a concept's features, it is immune to some of the difficulties that are especially challenging for the Classical Theory. First among these is the lack of definitions. Since the Prototype Theory claims that concepts don't have definitional structure, it not only avoids but actually predicts the difficulty that classical theorists have had in trying to specify definitions. Similarly, the Prototype Theory is immune to the problems that the Classical Theory has with analyticity.

Given its rejection of the classical idea that concepts encode necessary conditions for their application, the Prototype Theory can embrace the Quinean critique of analyticity. Additionally, the theory makes sense of the fact that subjects generally list non-necessary properties in the generation of feature lists. The rejection of necessary conditions also highlights the Prototype Theory's emphasis on non demonstrative inference. This is, in fact, another advantage of the theory, since one function of concepts is to allow people to bring to bear relevant information upon categorizing an instance or exemplar.

On the one hand, a concept should encode a considerable amount of information about its instances and exemplars, but on the other, it shouldn't include so much that the concept becomes unwieldy. The solution offered by the Prototype Theory is that a concept should encode the distribution of statistically prominent properties in a category. By representing statistically prominent properties, concepts with prototype structure generate many more inferences than do classical representations; they trade a few maximally reliable inferences for many highly reliable though fallible ones. The Prototype Theory also has an attractive model of concept acquisition in fact, much the same model as the Classical Theory. In both cases, one acquires a concept by assembling its features. And, in both cases, it's often assumed that the features correspond to sensory properties. The main difference is that on the Prototype Theory, the features of a concept express statistically prominent properties. So on the Prototype Theory the mechanism of acquisition embodies a statistical procedure. It doesn't aim to monitor whether various properties always co-occur, but only whether they tend to. Of course, to the extent that the Prototype Theory inherits the empiricist program associated with the Classical Theory, it too faces the problem that most concepts resist analysis in sensory terms. Like the Classical Theory, the Prototype Theory can be relieved of its empiricist roots. When it is, the model of concept acquisition is at least as compelling as the Classical Theory.

Probably the most attractive aspect of the Prototype Theory is its treatment of categorization. Generally speaking, prototype theorists model categorization as a similarity comparison process that involves operations on two representations one for the target category and one for an instance or an exemplar. A number of readers interpreted Rosch as suggesting that every category is represented by a single prototype or best example. the notion of a single prototype as a category representation, which is called the best example idea, has not been very widely adopted. Instead, the prototype view proposed by Rosch has most often been interpreted as a summary representation that is a description of the category as a whole, rather than describing a single, ideal member. A critical component of the prototype view is that it is a summary representation. The entire category is represented by a unified representation rather than separate representations for each member or for different classes of members.

This view explains the failure of the classical view. First, no particular feature is required to be present in order to categorize the item. The inability to find such defining features does not embarrass prototype theory the way it did the classical view. So long as an item has enough dog features, it can be called a dog—no particular feature is defining. Second, it is perfectly understandable why some items might be borderline cases, about which people disagree. If an item has about equal similarity to two categories, as tomatoes do to fruit and vegetable, then people get uncertain and change their mind about it. Or even if the item is only similar to one category, if it is not very similar in other words, right near the categorization criterion people will not be sure about it. They may change their mind about it on a different occasion if they think of slightly different features or if there's a small change in a feature's weight. Third, it is understandable that any typical item will be faster to categorize than atypical items. Typical items will have the most highly weighted features, and so they will more quickly reach the categorization criterion. Researchers generally cite two

problems as conclusive reasons to reject the classical view as a general view of concept. First people seem to possess concepts without the ability to specify the necessary and sufficient conditions for membership in the category. In sum, people who seem to possess concepts and use those concepts with considerable success sometimes cannot formulate anything like a definition of that concept. The classical view has to explain why people have difficulty offering the sorts of definitions that constitute the meaning of those concepts. A second, even more troubling difficulty for the classical view came into focus in further psychological research. The classical approach predicts that all instances of a concept are equally members of the concept's class. Hence, one should not find that people make some individual instances of a concept as more typical instances of that concept than other instances.

The Prototype Theory is an idealized version of broad class of theories, which abstracts from many differences of detail. According to the Prototype Theory most concepts including most lexical concepts are complex representations whose structure encodes a statistical analysis of the properties their members tend to have. In this theory the features of a concept are not taken to be necessary as they were in the classical theory. In the Prototype Theory applications is a matter of satisfying a sufficient number of features, where some may be weighted more significantly than others. For example, if dog is composed of such features as tail four legs, barks and so on then on the Prototype Theory, Labrador are in the extension of dog because they tend to have all the corresponding properties. The rejection of Classical Theory is based on the work of Wittgenstein, which states that the things that fall under a concept often exhibit a family resemblance. They form a complicated network of similarities. For Wittgenstein as for Rosh and Mervin a word or concept like FLOWER is not governed by a definition but rather by the possible set of properties which occur in different arrangements. Different flowers have different properties but despite

this, the properties of flowers overlap in a way that establishes a similarity space. As the Prototype Theory relaxes the constraints that the Classical Theory imposes on concepts features it is immune to some of the difficulties that the Classical Theory faced. The Prototype Theory also has an attractive model of concept acquisition almost same as Classical Theory. In both cases, one acquires a concept by assembling its features and the features correspond to sensor properties. But the difference is this that in case of Prototype Theory, the features of a concept expresses statistically prominent properties. The most attractive aspect of the Prototype Theory is its treatment of categorization. Prototype theorists model categorization on simple similarity comparison process, which has two levels of representation. First is for the target category and next for an exemplar. But this theory also faced a number of problems the typicality effects don't argue for prototype structure , ignorance and error is as much a problem for Prototype Theory as for Classical theory , many concepts lack Prototypes ,the Prototype Theory does not have an adequate account of compositionality.

6.3 COMPARISON OF CLASSICAL AND PROTOTYPE THEORY:

The Classical Theory has occupied a central position in defining concepts for a long period of time, the reactions to the classical theory developed into other theories regarding the structure of concepts. The Classical theory is attributed to Aristotle and the Prototype theory is given by Plato. In Classical model category membership is determined on the basis of essential features which same classes of thing share attributes whereas in prototype model features that occur frequently lead to establishment of category. In classical theory categories have clear boundaries and its features are binary, on the other hand in prototype model categories are formed through experience with examplars.

According to Prototype theory concepts are represented in mind as prototypes and membership in the conceptual category is determined by similarity to the prototype.

6.4 DISCUSSION:

As many researches are evident that prototype theory of concepts helps to understand the formation of concept better than classical theory, I also support prototype theory over classical theory because of the following reasons. The problems for which the Prototype theory is taken over Classical theory are people cannot give explicit definition of the concepts in regards to classical theory. The classical theory includes generic attributes which are not true for all category exemplars. People change their minds from one occasion to the next because they cannot agree on whether some borderline cases fall in the concept class or not and furthermore it lacks typicality too. The prototype theory covers all the areas like explicit definitional structure, generic properties and typicality unlike classical theory which helps to resolve the problems previously analyzed in case of classical theory.

CHAPTER – 7

CONCEPT DEVELOPMENT OF CHILDREN

INTRODUCTION:

Basic concepts are tools that enable a child to make sense of the world. They help the child to explore the world in a logical way and enhance its ability to understand its properties such as direction, location, position, number, quantity, sequence, attributes, dimension, size, similarities, differences etc. They assist children in their ability to follow instructions; they also help children be more specific in the choice of their words. It also enables them to understand and follow instructions in a better way. Basic concepts are also necessary for early success at school, they help the child to read and write better and become better communicators Concepts are tools and as such have powerful implications for children's reasoning both positive and negative.

In order to function in society one must learn the rules and structures of the language system. One structure of language that helps a child to become more specific in their understanding and use of language is the knowledge of concepts. It is important for children to have a good understanding of different concepts as it assists in their ability to follow instructions and be specific in what they are talking about. In order for a child to use concepts in their spoken language, they first need to have a good understanding about what these concepts are and what they mean .Concepts provide an efficient way of organizing experience. If children will be unable to categorize, their experiences would be chaotic, filled with objects, properties, sensations, and events too numerous to hold in memory. Concepts do more than organize information efficiently in memory. They also serve an important

function for a range of cognitive tasks, including identifying objects in the world, forming analogies, making inferences that extend knowledge beyond what is already known concepts can be thought of as the building blocks to these more complex skills. Early concepts relate to common experiences in daily life. Concept development is a long and difficult process because of the limited knowledge and experience children have. They cannot perceive an object or situations in the same way adults do. If concepts are to develop adequately three essentials need to be met – ability to see relationships, ability to comprehend underlying meaning and ability to reason. To be able to perceive meanings the child must be able to see the relationship between new experiences and previous experiences. At every age it is easier to see relationships accurately if new material has something in common with past experience. Children perceive things at their face value, missing a meaning that is not readily apparent. To be able to understand accurately what is heard or seen, the child must use inductive thinking and sometimes even deductive and creative thinking. As children acquire new meanings from new sources, they add them to old meanings previously learned. Children are subjected to different experiences inside and outside the home, it is to be expected that children of the same age and level of development will have different concepts. Concept development follows a pattern, as new meanings are associated with old. Concepts change from simple to complex and from concrete to abstract. The time needed for these developmental changes depends on the children's intelligence and learning opportunities. Concepts influence behaviour, all concepts influence personal and social adjustments by influencing the quality of behaviour.

The child who has a poor understanding of concepts may face difficulties in identification of a problem, formation of strategies and the performance for solving it. A majority of children learn concepts through incidental learning, a structured teaching of the concepts helps

in reinforcing the true and complete nature of these concepts. Incorporating concepts in the day-to-day language is helpful because children learn by listening to adults and following instructions. Helping children to learn the words that represent the concept helps children to learn procedures later on.

Semantics is the study of word meanings. Semantic relationships are the ways that words are related to each other. Semantic knowledge is an important part of children's language development that helps them understand and express more complex concepts and ideas. It is important to give opportunities for children to engage with various concepts including shapes and spatial thinking. This helps the children to "rehearse" the language that is needed to explore various concepts.

Concepts are the ''big ideas'' that children learn as they engage in a range of experiences. Children's vocabulary and concept development is dependent on consistent, nurturing and interacting learning experiences with adults and peers. Children need to have a large and varied vocabulary that continually grows.

Thus, concept development and vocabulary are key components for language learning. Developing these skills can pave the way for learning in language, the arts, sciences, technology, and mathematics.

7.1 DIFFERENCE IN ADLUTS' AND CHILDRENS' CONCEPT:

Children and adults differ in terms of the content of their concepts, as children simply don't have the knowledge and experience that adults do. But more important is the question of whether children's concepts have a different structure, follow different principles, or are qualitatively different in some way from those of adults. The concepts of children and adults differ radically, because child concepts eventually develop into adult concepts, any qualitative difference between the two gives rise a problem in explaining development. Piaget's framework fell well within the classical theory of concepts. He

took an explicitly logical perspective, in which objects are divided into well-defined sets and thinking about categories involves logical analysis or combination of those sets. The work of Piaget (1964) influenced all later work on conceptual development. Concepts and their manipulation were just part of the more general development of logical thought in Piaget's framework. Such a logical approach, based on set theory, required that one be able to specify exactly what is in every set that is, it required that every set have a definition. Like other classical theorists, Piaget never argued for that view of concepts, but simply assumed it, they assumed that there are normally necessary and sufficient properties for each concept. In order to demonstrate that children know concepts, Piaget argued that they should be able to give an adequate definition of the concept and furthermore show skill in answering logical questions about it, using quantifiers such as all and some. He didn't think that children could fully form categories until they were quite elderly. This classical theory of concepts has been abandoned, and there is no particular evidence that it is true for children than it is for adults. The classical theory of concepts has been abandoned, and there is no particular evidence that it is true for children than it is for adults. Children's concepts also reveal typicality effects that helped to overrule the classical view in the adult. The task that Piaget used for understanding children's concepts was an object sorting task. He assumed that if children have classical concepts, they would sort items into groups that could each be defined by criteria features. Thus, if given a set of colour geometrical tokens, children might divide them into groups according to shape or perhaps shape and colour. Again if provided with a set of representational toys, they might divide them into animals and non animals, and then divide the animals into four-legged and two-legged, and so on.

Piaget found that children often do not make such nice, taxonomic categories based on shared properties. Instead, they often gave two kinds of responses. First, young children sometimes built structures or

made images out of the items. These could be complete pictures example, arrange the items into the shape of a house or could simply be a sequence of items that did not fit any definition. Often, pairs of items in the sequence would be related example, the first two might be triangles, the second and third might both be green, the fourth and fifth might both be tiny etc. But the whole sequence would have little or no coherence. Such a sequence of pair wise relations that do not fit any overall definition is often called a complex. A second kind of response was when children put items together according to thematic relations, based on their involvement in the same event or setting. For example, children might put a man and a bike together saying that the man would ride the bike; and they might group a cat and milk, saying that the cat would drink the milk. Later experiments have often used a triad task, in which one object is given (e.g., a cow), and then the child is asked which of two other objects it is like. Children simply do not think or talk about shoes very much except in the context of putting them on or taking them off, and so there is necessarily a correlation between their use of the words and certain situations. Overall, however, object names did not show a restriction to particular situations, actions, or associate different objects in their analysis. A child learns that presents, cake, candles, and guests are all likely to be found in a birthday party, and learning this is part of learning about parties in our culture; it is also of great interest to most children. Thematic information is thus one form of general knowledge that children must learn about; it is not an irrelevant or unimportant response. The unusual aspect of children's responding, then, is not that they know about and use thematic relations, but that they sometimes use them in preference to taxonomic responses when asked to choose things that are of the same type. Piaget's claim about a shift from thematic to taxonomic categories has two components. The first is that children's concepts are thematic or complex. The second is that adults' responses in the sorting task are taxonomic. Children's preferences for thematic responses were encouraged by aspects of the traditional tasks such as the vague instructions, lack of strong taxonomic categories, and the spatial nature

of the sorting task. Even children who responded thematically were probably able to form taxonomic categories and would have done so under other circumstances. It is wrong to say that children have very confused complicated or thematic categories in contrast with adults' taxonomic categories. Children can and do form taxonomic categories, and adults can also be sensitive to thematic relations. Virtually every study that has either compared known categories or that has taught children new categories at different levels has found that the basic level is considerably easier for the child to learn, children's concepts are much like adults' in their preference for a given level of categorization, which is reflected in learning, naming, and induction. The infants begin to produce words on their own, they are sensitive to a link between words and concepts, as development carries on this initial link between words and concepts becomes increasingly precise, increased by the infants' experience with the objects and events they encounter and the structure of the language is learned. In infancy, words possess a unique influence on conceptual representations, as compared to other auditory signals. By the age of 2, a child has made significant headway on the problem of word and concept learning. They have discovered that there are distinct kinds of words and have established a storehouse of distinct kinds of concepts. Words influence infants' interpretation of the objects and events that they observe, and in the second year of life, the links between kinds of words and kinds of concepts become increasingly precise. These distinct links between kinds of words and kinds of concepts support our capacity to move flexibly and quickly among various interpretations.

Children do not have the facility in learning and using concepts that adults do. It is harder for them to learn concepts, and they often have misconceptions and errors that last for years (e.g., thinking that dolphins are fish or that an ostrich is not a bird). Nonetheless, children learn new concepts at an amazing rate, and many of our most essential concepts are to a large extent formed during childhood. It is remarkable

how qualitatively similar the basic processes of concept learning and representation seem to be in children and adults. Although the field of developmental psychology had traditionally focused on what were apparently major differences between children and adults? Children show effects of typicality in categorization and learning, just as adults do. They use hierarchical category structure fairly early, and show a basic-level advantage very similar to that of adults. They use knowledge in learning categories and in making categorical inductions, again like adults. People can get too carried away in such comparisons and end up thinking that children are just like adults. That is clearly not true. Although a child's conceptual abilities are quite similar to those of adults. The differences seem huge due to differences in experience with category members; differences in domain knowledge; and differences in processing capacity or fluency. Differences in children's knowledge are obviously related to their lack of experience. However, if we take ''knowledge'' as referring not just to anything that one knows, but to a somewhat coherent set of beliefs about a domain, it is clear that children gain not only experience with category exemplars but also an understanding of general principles and patterns in various domains. Some of this is due to parental input and education, but some is simply due to the child figuring things out on his or her own. Of course, early knowledge may not be very accurate (and the same is unfortunately true for adults), but it apparently influences category acquisition nonetheless. As a result of gaining knowledge about biology, social relations, materials, and so forth, children's concepts can become more sophisticated. In the concept acquisition literature, such comparisons are not often made directly. It takes children longer to learn categories because they cannot encode and remember as many features about each exemplar during learning; alternatively, perhaps because their familiarity with such categories and their features is less that is because their knowledge is less, they cannot remember the stimuli as well. Either way, it seems likely that processing capacity is the cause of at least some differences between children and adults. The difficulty children have with atypical category members is due to their

being unable to remember specific items. If more typical items are forgotten, there is less damage, because other items will be similar to them. If we forget that a robin is a bird, still you will be able to identify it if you remember that crow and sparrows are birds. The exact proportions of these causes for differences between children's and adults' concepts are unknown.

7.2 DISCUSSION:

Many studies have shown that children's working memory is less than that of adults and their learning are generally slower. Adults are good in learning and absorbing new information. It feels like children are better at it, because they tend to constantly be in learning mode, compared to adults. The adults learn better than children because of the number of experiences, mental models and pre-existing knowledge they have to draw upon. Connecting new information with the knowledge we already have ensures better and faster comprehension, as well as long-term preservation of the Concept. This is the reason that allows adults to utilize techniques in learning that make them more efficient and effective at it.

CHAPTER - 8

CONCLUSION

INTRODUCTION:

Concept development is a set of activities that are carried out in our everyday life to collect information for our daily needs, it also helps to develop concepts and select a preferred one according to situation. Human beings are remarkably smart, they process complex motor skills, use language, make inferences, develop and use theories, make scientific innovations, make laws, live independent life, and adapt to complex dynamic environments.

8.1 WHY CONCEPTULAL DEVELOPMENT IS IMPORTANT FOR US?

We do not have these skills by birth, each of these skills require conceptual knowledge. The understanding of how people acquire conceptual knowledge in the course of development and learning is an interesting field in the study of human cognition. Concepts are to us like the air we breathe. They are everywhere. They are essential to our lives. But we rarely notice them. Yet only when we have conceptualized a thing in some way, only then, can we think about it. Nature does not give us, or anyone else, instructions in how things are to be conceptualized. We must create that conceptualization, alone or with others. Once conceptualized, a thing is integrated by us, into a network of ideas (since no concept or idea ever stands alone). We conceptualize things personally by means of our own ideas. We conceptualize things socially by means of the ideas of others (social groups). We explain one idea by means of other ideas. Concepts development is a process by which a person learns to sort specific experiences into general rules. With regard to action, a person picks up

a particular stone or drives a specific car. With regard to thought however, a person appears to deal with classes. For instance, one knows that feather (in general) floats and automobiles (as a class) are powered by engines. In other words, these things are considered in a general sense beyond any particular stone or automobile. Awareness of such classes can help guide behaviour in new situations. Thus two people in a bakery may never have met before, but, if one can be classified as customer and the other as clerk, they tend to behave appropriately. Similarly, many people are able to drive almost any automobile by knowing how to drive a specific automobile. A concept is a rule that may be applied to decide if a particular object falls into a certain class. The concept "citizen of India" refers to such a decision rule, meaning any person who was born in India or who is a child of an Indian citizen or who has been legally naturalized. The rule suggests questions to ask in checking the citizenship of any particular individual. As most concepts do, it rests on other concepts; "Indian citizen" is defined in terms of the concepts "child" and "territory." Many scientific or mathematical concepts cannot be understood until the terms by which they are defined have been grasped. In this way concept formation builds on itself. Concepts allow us to classify objects and events. In learning a concept, you must focus on the relevant features and ignore those that are irrelevant. For example, paperbacks and hardcover editions are all books. But you must also discriminate on the basis of relevant features: a stack of papers is not a book. What is the crucial feature of a book? Usually it is the presence of a binding. Most concepts, however, cannot be identified on the basis of a single critical feature. Most of the words we use refer to concepts and not to particular things.

A more complex form of realistic thinking underlies the ability to identify or use a class of items, as in selecting several different kinds of triangle from an array of other geometric figures. In the course of solving the problem, the individual will link together a newly

experienced group of objects according to one or more of their common properties. This new grouping is then given a general name as in first learning the meaning of the word triangle. It might also be determined that a new object fits an existing category. Physical objects are multidimensional; that is, they may vary in shape, size, colour, location (in relation to other objects), emotional significance, or connotative meaning. How a person identifies such dimensions, develops hypothesis or tentative conclusions about which of the specific dimensions define a class, arrives at the rules of class membership, and tests various hypotheses all reflect his ability to grasp concepts. Successful performance in all these processes leads to the formulation of pertinent rules based on one's ability to classify specific items Concept formation is a form of thinking that helps us to better understand the world we live in, as well as ourselves .It is useful to consider the scope of the conceptual system. The scope is remarkably broad: It includes the world, the way the world is represented mentally, and the language, with each component having its own structure. First, the world is structured; if it were not, it would have consisted of "a set of stimuli in which all possible stimulus attributes occurred with equal probability combined with all other possible attributes .Humans encounter everything in experience as something that can be "given meaning" by the power of our minds to create a conceptualization and to make inferences on the basis of it. We do this every day and automatically that we do not even recognize ourselves as engaged in these processes.

8.2 DISCUSSION:

In our everyday life we don't experience the world in "concept-less" form and then deliberately place what we experience into categories in order to make sense of things. Each and every act in which we engage is automatically given a social meaning by those around us. To the uncritical mind, it is like things are given to us with their name inherent

in them. All of us fall victim to this illusion to some degree. Thus we see, not shapes and colours, but clouds, trees, people, road, birds, sunrise and so on and on. We see the 'big picture' and conceptual development helps in understanding of the context, perceive and imagine, predict and hypothesize, and to conclude and reflect. It also helps to understand how things are associated and connected to each other.

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