Introduction to Cognitive Psychology
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Lecture – 17
Concepts and Categories: Let me Organize

So, welcome friends welcome back to this lecture and concepts and categorisations and basically I had given it the title let me organise. So, basically that is what our concept on categorisation really mean it helps you to organise knowledge. Now what do we study in this particular lecture?

So, what we do is this lecture is exactly an extension of the semantic memory lecture; where we saw how world knowledge, facts and arithmetic rules and procedures and that kind of knowledge which has some element of consciousness into it how many element of a consciously trivial into it? How are they arranged into the cognition? How is it arranged into the mental concept or the mental structure.

So, what concept and categorisation are basically these are the process of organising this knowledge. Now in the semantic memory lecture, we saw that there are several models and these models what they do is they go ahead and explain the organisation of knowledge into semantic memory. And one of the famous models which was explained in the semantic memory lecture was the hierarchical structure model.

So, but the hierarchical structure model explained is that there are nodes and these nodes are connected by pointers and so, the top level nodes and sub level nodes and so on and so forth. So, that is kind of arrangement with the semantic memory lecture talks about.

So, basically what in this lecture will see is this how what is the meaning of this node or what is the feature of this node and so, the nodes that we talk about in semantic memory lecture is basically concepts. So, concepts are kind of mental representation they are kind of nodes which hold lot of knowledge into it and concepts also help us in categorizing information. So, why is categorisation important?

So, as you remember that the human brain has a limited capacity and so, it can do only limited number of jobs now number of neurons is limited we saw in the lecture on long term memory that there is a limited number of information that you can hold on to

memory given the calculations which have given there which basically means that the human brain has to do something in terms of organising or in terms of archiving data in a in the mental lexicon and so, one way to do that is basically categorisation.

So, categorisation is a process which basically goes ahead and it form some kind of a mental bucket where you put an information based on either similarity or some other aspect. So, basically that is what the categorisation really mean and the principle in which categorisation works is basically the principle of how concepts are form or what are the guidelines of a concepts. So, using the guideline of a concept categorisation is done

So, let us this gen began this lecture on concept and categorisation now let us look at this psychology what is it psychology is a basically most Indian Universities; they are taught under the art stream they are taught under the arts faculty or sometimes under the social science faculty and so, most people when you talk about psychology they will say that this is subject of the arts or a subject of the social sciences and you emerge an social sciences, but most old universities will club in it to arts, but if you look into most western universities psychology is not an arts. It is not taught under arts its taught under brain behavioural sciences or sometimes it is thought under medical sciences or natural sciences.

Now this basic classification of where psychology should be is basically a demonstration to show how categorisation happens and these categorisations of placing psychology into social science or arts or into the natural sciences or into the medical sciences. Basically they are done based on some kind of a conceptualisation basic basically based on some kind of a rule or some kind of an aspect or some kind of a feature that psychology share with these sciences and so, this is basically formation of a concept.

So, there is a concept and a concept is basically a mental representation a mental bucket. So, the reason why these western universities go ahead and classify psychology in to sciences as oppose to what in our country it is done in terms of the arts or in social sciences is basically depend dependent on the mental representation of how they look into psychology and so, this is basically a demonstration of how concepts and categorisation happen.

So, they have some concepts the western has some concept of psychology because it uses scientific methods or verification of some kind of data falsification some kind of reputations and experimentations and so, they are classified into science, but in terms of our own country.

They do not look at these aspects and they have some other aspects of psychology for example, is social aspect or organisation aspect and because of that they classify them into then the arts sciences or in into the social sciences group dealing with society and so on and so forth, but that is the kind of division it is there and so, this example then explains what is the difference between a concept and categorisation, but before going into the more details of it let us look at what is basically the proper definition of a concept or a categories..

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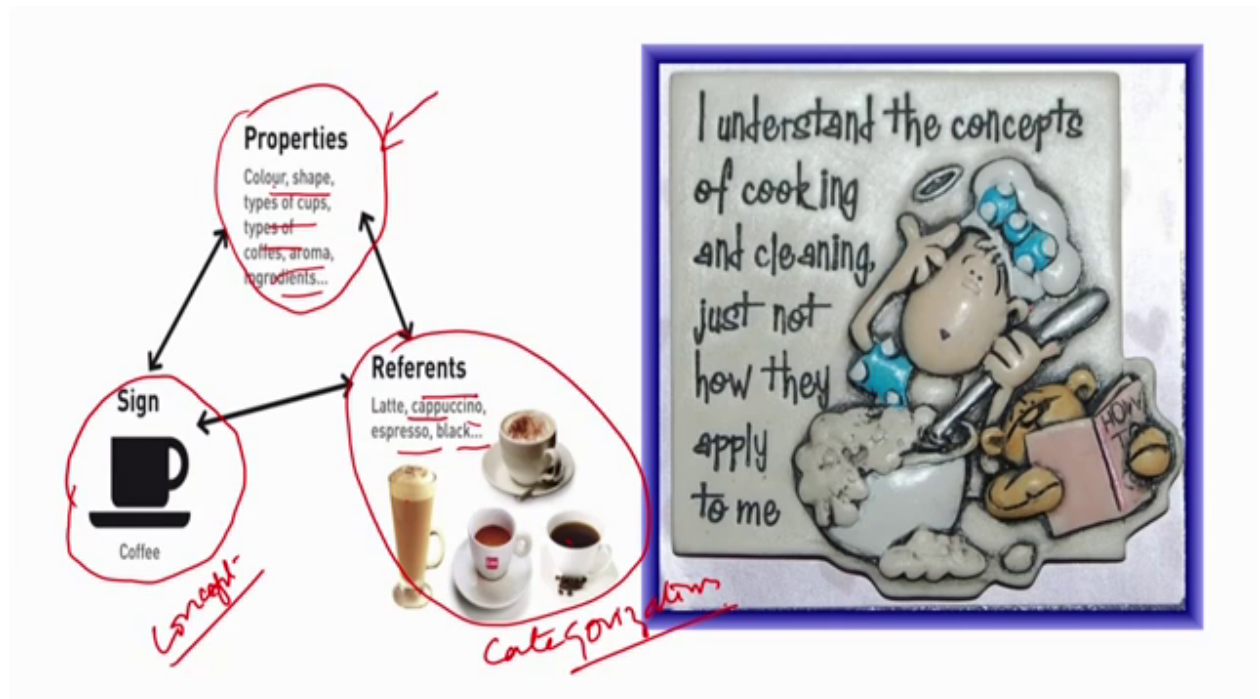
So, starting, before starting, I have some diagrams or I have some figures for you which have quite funny to look at and they explain something about what are concepts and what are categorisation and so, first figure says that there are a property. So, a concept has certain property and so, within the concept then you have. So, here you see the concept of a cup and a coffee which is a sign of a concept. So, basically it is an emblem of a

concept or it is the logo of a concept and so, when you see something like this you basically believe that it is a coffee shop or it is something which is hot beverage to be run

And o, it has certain properties. So, when I say it is a coffee this drawing represents a coffee at a certain properties and these are the properties of a concept and so, further on this is the concept. So, if you look into it this is the emblem or this is the referral or the logo for a concept and these are the properties of this concept and so, basically this is what a concept looks like. So, it is the mental representation of what a coffee will look like these are the properties of a concept. So, every type of coffee that we classify here that we put here into this coffee the diagram should have these properties and as I look into it this is called categorisation.

So, in categorisation what you do is you take in items or you take in elements events or instances of objects which are similar to the concept we place it under one particular bin and that is basically called categorisation. So, as you look into it. So, this is coffee it. So, there are properties of coffee is a shape type colour or aroma ingredients and so, on and so, forth and in terms of categorisation the reference are latte cappuccino aspera.

So, black coffee or the ice coffee or it could be some other form of coffee which could be Irish coffee or some other form of coffee which it could be. So, basically this is the concept and this is the property of categorisation and so, categorisation has done in based of these properties. So, as you see that most of this type of coffee is have these properties and so, this is the process of categorisation.

Now, a funny cartoon to look into it and so, here if you look on the right hand side there is this particular cartoon which explains that this lady says I do understand the concept of what cooking is I know how does the apply to miss it and does not want to cook and so, that is the reason why she has putting into these facts here and so, that might be the reason why she is saying what she is saying.

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What do humans process by cognitive processes?

In general, cognitive psychologists believe that humans *__form mental representations__* and it is these that are processed by cognitive processes. Thus all *__knowledge__* in humans are stored as *__mental representations__*, and they in turn guide our behavior. Mental representation are stored *__as concepts & categories.__*
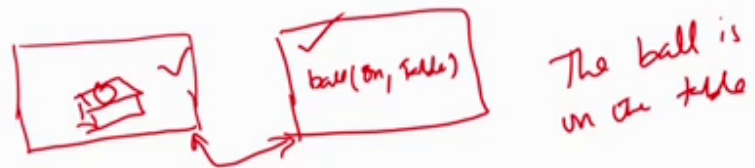
So, again coming back to the definition of what concepts are before we understand that let us look at what do humans do by doing cognition or what does cognitive process actually they do. So, in general the cognitive psychologist believe that humans they form mental representations and that these are processed by the cognitive processes. So, whenever we a whenever we store knowledge or whenever we take world knowledge and store into our brain or mind what we do is we form a mental representation of it and this mental representation is what is processed by the brain or by different cognitive processes.

So, what is basically mental representation mental representation is the psychological equivalent of the physical representation right and so, remembers in the first lecture when we looked at different-different kind of mental representations? So, we saw the special arrangement and the abstract arrangement. So, in terms of for example, if I there are2 mental representation that I will show you here and so, one mental representation what really happens is that I can show you a visual or a prepositional mental representation.

When the visual representation, I draw this kind of a structure and I put a ball on it and so, this explains is the ball is on the table or in the propositional representation I can say ball on an table are2 propositions of how the ball is connected to it. So, remember from the first class both of them represent the same thing the idea is that the ball is on the table

and so, these2 formats are what are called mental representations and so, what are mental representation these are the psychological equivalent of physical representation. So, what cognition does is that they take in information on the world and form mental-mental representations and use several cognitive processes to process this mental representation and so, thus all knowledge in humans are stored as mental representations and that they in turn guide behaviour.

So, basically then most knowledge that we have they are stored in terms of these mental representations different kind of mental representations beat is visual beat in auditory for beta in propositional form and a different other different forms of propositional form is a famous form which Anderson goes ahead and talks about he says that most mental representations are stored in propositional form. So, this is a proposition to it and so, that how basically it is stored into. So, we did the some part of propositional thought in propositional representations in the earlier classes. So, remember from there that is what it is.

So, basically then the idea here is that it is mental representations that hold the knowledge and is mental representation that are processed by human beings and most behaviour that human do is by the processing of these mental representations. So, mental representations how are they stored they are stored as concepts and categories. So, remember the coffee example what we did was the idea the logo of a cup kind of a gion or cup kind of a gion and a plate kind of a gion represents a coffee.

And so, this is the mental representation of visual mental representation and when I show you this there are several knowledge which comes within for example, the properties the type of things. So, the remembering different types of it; it basically calls in the process of categorisation and remembering that this is coffee is called the concepts. So, basically concepts and categorisations are basically play around mental representations.

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What is a concept?

A concept is a ***mental representation of some object, event, or pattern*** that stores in it much of the ***knowledge*** typically thought ***relevant to that object, event or pattern***.

e.g., dog (concept) = animal, 4 legs & tail, man's best friend (knowledge)

So, what is a concept then what is the meaning of a concept the concept is the mental representation of some object event or pattern that stores in it much of the knowledge typically thought relevant object pattern or event. So, basically mental representation the concepts stores in some mental representation and knowledge related to mental representations. So, in earlier example, the idea of the coffee logo it stores with it that this the logo.

So, the mental representation of a coffee in terms of the logo and some knowledge which is relevant to it in terms of object event and patterns; so, for example, the different type of coffees which are available right what is the aroma of a coffee what is the taste of a coffee where can I find it what is the price of a coffee different countries from where coffee comes in and so, these are all related knowledge's, right related to the idea of coffee and so, this is what is stored into that particular concept of a coffee.

So, it is basically in terms of semantic memory if you activate that node if you energise the coffee node several other nodes will energise. So, when I think about a coffee cup when I see about a coffee cup a lot of knowledge comes to mind and these lot lots of knowledges are connected to different-different semantic networks and so, one is if one is energised the other is also energised and so, depending on the context depending on the priority the or nearness or semantic nearness it, it will decide which I energised more

and which I energised less basically something of from the semantic memory thing. So, basically let us now stick to only the idea of what are concept and categorisation is.

So, in terms of an example the idea of a dog the concept of a dog what does it comprise of it comprises of that it is an animal. So, first thing is in terms of a dog a dog is an animal it has 4 legs. So, basically another piece of knowledge which has stored with it; it has 4 legs it has a tail it has man, man's best friend these are all different kinds of knowledge and all different kind of facts which are there or it barks or it eats certain kind of foods or there are different varieties of dog all these information is basically stored in to a concept. So, concept is basically a mental win around which knowledges are stored a number of knowledges stored or comprised into or fitted into and so, that is what a concept is.

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What is a category?

A category can be defined as a ***class of similar things (objects/entities)*** that ***share one or two things***: either ***an essential core*** (e.g., why all sciences courses are considered "science") ***or some similarity in perceptual, biological, or functional properties***

Now, if that is what a concept is; what is categorisation. So, basically a category is defined as a class of similar things object or entities that share a couple of factors and has an essential core. So, basically what do I mean by this its type of things or classes of things which have similar objective with similar object or similar entities for example, let us look at a canal of dogs or a field of the dogs full of dogs now when you look into it then different kinds of dogs or if you have seen dog shows now in dog shows you see

basically a dog show is a category and so, what happens is there are different kind of dogs or dog itself is a category. So, within the dog category you have different kinds of dog you would have a Pomeranian you would have an Oracion you would have a scent Bernard you will have German shepherd and some other kind of dog different kinds of dog which is there or Rottweiler and so, different kinds of dogs are there and all of them differ in some aspect or the other.

So, there are variations there are differences with it, but they share one or2 things which are essential core for example, the idea that they have bark now that is the core property. So, most dogs that you look into will bark although there will be an exception and so, they will discussed it in the last class, in semantic memory were it might be possible that one or2 incidents may not be similar. So, that is one thing to be looked at.

So, categorisation includes similar things together, but then what happens is they share one or two features or they share at least one essential core with it. So, for example, the idea that why all science courses are considered as sciences. So, the basic question that we did or some similar; similarity in perceptual biological or functional property; so, basically things which are clubbed together which are categorised together they share some kind of features. So, either they share in essential core or they share some kind of similarity between them. So, we can always have categories where things do not share properties for example, let us say the category of an house.

Now when I say the category of an house within the house will have several things for example, you will have a mother a father which are human beings then you will have chairs desks or you will have tables and you will have eating things electrical appliances all of them together are there, but they can be clubbed together as a category. So, these features then share one feature which is they are parts of a cat category the house or the house hold right and so, this is how it is.

So, at times most items in a categories share some kind of a feature on at times what happens is that there is not share co features, but they share characteristic features or they share some properties which are either perceptual biological functional or some other relation, but something is shared up on them.

So, items which share some kind of features together and club together is what is a category or what is the process of categorisation then what is the nature of a concept. So,

as I explained to you the nature of a concept has to do with the idea of categorisation and what can a concept actually do now concepts help us in establishing order on the knowledge base. So, what does it really mean it really means that through categorisation through form formation of concepts we can form some kind of an order; for example, what is the higher concept what is the lower concept who is bigger who is smaller kind of a thing.

So, within a number of concepts within a number of items which we have we can then assign some kind of order now remember in the hierarchical semantic network we looked at something called the sub ordinate and super ordinate node right and so, concepts share or concepts are always the super ordinate node and other things items when the super the sub ordinate nodes similarly when we have concept these concepts allow us to basically arrange things into order; for example, think about musical instrument. So, musical instrument is a higher level concept within that we will have string instruments we will have air instruments we will have wind instruments we will have other kind of.

So, instruments which can be beaten to be played for example, drums and all. So, different kind of instruments will be there. So, there is an order to it. So, and this order of how it starts with the musical instrument to coming back to a string instrument and within the string instrument you have the guitar or the sitar and then you will have several others. So, there is a hierarchy or there is an order and so, this order classification is important and that is what categorisation really or concepts really do.

Also concepts help us to categorise that is what I was trying to tell you that with concepts we can put items into mental bucket. So, once we know that this is what a concept is this is what concept a is this concept b is this these concepts will have certain features right certain aspects and these aspects will help us put similar things together right and so, that is what concepts really do also categorisation helps us making prediction for example, if something is coming from somewhere a 4 legged animal is coming from somewhere wagging his tail and he comes near us and his tongue is out of his mouth and he is sweating kind of dripping on to food.

So, in he is looks more or less like a category of a dog then you can predict that it will also bark right and so, this idea that if it looks like a dog it can classify into a dog you can make predictions. So, categorisation helps you in making predictions of what a

particular item a new item into categories suppose to do because it should share some features to the category. So, with that with all these features you can then say that if this is a dog it is going to bark and it is going to be men's best friend and so on and so forth. So, this kind of conceptualisations can be developed and so, that is what a a concept really does. So, what is the nature of a concept.

So, explaining the nature of a concept several models were developed they were different models and these models actually go ahead and develop the nature of a concept for example, one of the model or the oldest possible model is called the classical view model now what are the classical view model says it is actually a model which dates back to time of Aristotle and it is dominate it was dominated in psychology till the nineteen seventies then they later on new or models for example.

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Nature of Concepts

The Classical View

It dates back to Aristotle and dominated psychology till 1970's. This view believe that *all examples/instances of concept share fundamental characteristics/ features.* In particular *the classical view of concepts* holds that the *features represented are individually necessary and collectively sufficient* (Medin, 1989).

The explanation based view of categorisation and conceptualisation came in and so, that took us or that took the centre state. So, the classical view is the most reliable view of till now. So, what does this view say it says that all examples or instances of a concept share fundamental characteristic features. So, basically what it says is that no matter what happens all instances or all different type of items which are clubbed together in a

concept which are called which are known to be part of a category and which resemble of concept they share certain fundamental characteristic features right.

For example, if I say that a dog then all dog should have a tail, they should wag they should bark and so on and so forth. Now in particular the classical view of concept holds the holds that the features that the concepts share together or items which represent the concept share together represent the features are represented are individually necessary and collectively sufficient.

So, mostly the what the classical view says is that most items which are grouped or categorised under a concept or categorised of known to be part of a concept or known to form a concept or resemblance to a concept now they should have something called features which are individually necessary and sufficient and collectively sufficient what is the meaning of individually necessary and collectively sufficient now individually necessary means that each example must have the feature if it is to be regarded as the member of the category.

So, basically each and every example should have the feature the kind of feature for it to be called a member of a that particular category or a member of that particular concept for example, looking again back into the dog concept. So, each member should have one feature that is barking. So, each dog should bark or it should have a tail which should wag right it should not have drooping tail kind of a thing or it should have a certain kind of face drooping ears men's best friend whatever you want to show it should have that things. So, so individually necessary means that every item should have that particular feature into it.

And what does collectively sufficient really mean. So, collectively sufficient means that anything with each feature in the set automatically becomes and inside of the concept. So, if something is presented to you a new item is presented to you which has each feature of the concept or each property of the concept it automatically becomes the part of the concept it becomes a category or the concept. So, in terms of looking at the triangle if we look at the individually necessary thing individually necessary says that that a which triangle should have 3 sides if it has less than 3 sides, it cannot be a triangle if it has more than 3 sides.

It cannot be a triangle and what does necessary sufficient mean necessary sufficient conceptualisation to the fact that it should have 3 sides it should be a close geometrical form and then it is a triangle. So, any figure which has 3 sides and which have some kind of a close geometrical form necessarily is necessarily called a triangle whether you call it equilateral triangle or you call it a right angle triangle or ipsilateral.

So, all kind of triangles would be there, but the idea is that it should have these 3 sides and a close geometric form and that is what that a classical view say. So, it very simple it says that they most concept they share instances and fundamental characteristics and these characteristics are individually necessary and collectively sufficient.

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Concept	Feature(s)
Bachelor	Male Adult Unmarried Human
Even number	Integer Divisible by 2
Triangle	Planar figure Closed geometric figure Three sided

Example, look at this let us look at the concept of a bachelor. So, the features are it should be male adult unmarried and human. So, then there is a problem to this right the if I look at somebody who is 10 years old, Now 10 year old person is a male or a boy whose 10 year old he is a male, he is an adult; he is unmarried and he is human, but he cannot be a bachelor. And so, these are the deviation which are there and so individually necessary collectively sufficient that is the problem with it, but then that is a thing for the criticism of the model, but before that let us look into this.

So, then bachelor should have these 4 aspects now any person any male who is an adult and who is unmarried and who is human is actually a bachelor similarly even numbers what are the concept of an even number what are the features of those numbers which are even the features are it should be first an integer. So, can be explained in the form of p by q first and it should be divisible by 2.

So, if we can do that then it is an even number and triangle for example, it should be a planar figure; so, it should be a figure which should be in a 2 dimensional or it should be in on some plane and then a close geometric figure. So, figure remember from the first class where we are doing perceptual illusion and we showed you this kind of a triangle right.

And so, this cannot be called a triangle the reason being that this filling the time doing here is done by the bin it is not bit triangle until and unless it has all the sides like this that cannot be triangle and so, it is not a triangle and so, for a triangle to be a triangle it should be a close geometric figure and then it should have 3 sides 2 sides cannot be a triangle and so, that is what the features are.

So, then what are the implications of this classical view the implications are concepts are mentally represented list of features.

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Implications of classical view

-It assumes that *concepts mentally represent lists of features*

- It assumes *membership in a category is clear cut*

- It implies that *all members within a category are created equal*

So, what then this classical view says is that concepts what they do is that they mentally represent a list of features which should be there and so, any item which comes in new should be compared against this list. So, if I say if a dog or a triangle a dog for example, if a concept then I have a list of features example it has to have 4 legs it has to have a tail a wagging tail; men's best friend should have should bark should have tongue out most of the type and so on and so forth.

So, there are the number of feature or list of feature. So, classical view says that concepts mentally represent a list of features and so, any new instances compared across that and no more fit it is no more closer it is also it assume that membership in a category is clear cut what it this particular concept or this particular model says is that any member of any category has a clear cut boundary the idea is that you are either a part of a category or you are not part of that category and so, that is how categorisation is done this boundary is very clear cut. So, you are either a dog or not a dog right and so, if you do not have the sufficient necessary features or individually necessary feature then you do not become a dog.

So, you should have feature a let us say I have a b c d e f g h features which are rated for a particular concept of a dog then any new instance or any new element which basically is compared to this instance then has to have these features and so, this it says that the boundary are very clear cut there is no disguise in the boundaries or there is no overlap in the boundaries.

And the third is that it implies that all members within a category are created equal which basically means that there is nothing called ideal concept and a non ideal concept what they say is each member of the category share equal kind of or equal in all relations. So, most members within a category are equal in some footing that is what the proposal is all about.

Now these are the problem and so, looking at dogs most dogs are equal that is what they will say what; so, although talking in terms of size. So, not talking in terms of size most dogs behave in similar manner that is what they will talk about and when I say it is clear cut which basically means that Chiwawa or Siamese cat are different because there is a clear cut idea that they do not bark and so, by barking is a individually necessary feature.

So, since the Siamese cat would not bark, it is not a dog and since a Chiwawa barks it is a dog and so that kind of a clear cut boundaries or that kind of a clear cut boundary is out there. So, these are the 3 implications of this view, but then this view has several criticism. So, that is a it is an old.

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Critics of classical view

-Rosch found that *people judge different members of a category differently*

-The idea that *people store and refer to a list of necessary features* when judging category membership *is doubtful*

-Most people *cannot generate lists of features that are individually necessary and collectively sufficient* to specify membership in a category

Concept and so, it has several problems with it first rosch found that people judge different members of a category differently right and so, what does it really mean it means that different-different members are categorised or arranged differently that is the reason and the reason why is that people judge category membership in terms of how would affect they are to the category right.

And so, when I look at anociation that is the classiest dog or the dodgiest dog that I can talk about, but when I look at a Chiwawa they does not seem like a dog and so, this variation of goodness of which is which element is a good fit to a category all characteristics of a category and some members not having this good fit is a problem because the implication says that it is very clear that each member share more or less the same features

But this goodness of it and the. So, for some people a latte could be or cappuccino would be a coffee, but a black coffee would not be a coffee and for some other people black

coffee is the ideal coffee and other coffees are variations of it. So, not a coffee and remember those or think about those people who are hard core junkies in terms of coffees. So, they will call coffee as a coffee black tea as a tea, but all other forms of tea has variations of tea and not a tea right.

So, it is variation of tea and so, this differences say that then the different kind of coffees the different kind of teas which are available are not in terms of sharing same features or not equally putted together which is implication of the classical view the idea; idea is that people store and refer to a list of necessary features when judging a category membership is doubtful now what does basically say that mentally remembering a number of features and then comparing is something which people generally do not do and that is the reason why you have abstract categories you a tend to have categories which are abstract which does not fall into some kind of a classification system and that is what.

When I look at categories like house hold or categories like market place now these categories then not then do not go ahead and compare this kind of a relationship or this kind of a mental features and that is why the problem is and that is what the problem is all about. So, people do not refer to these kind of list and they make violations in terms of comparing things to a list right and the third things is that most people cannot generate list of features that I individually necessary and collectively sufficient to specify memberships into a category.

So, basically what it says is that when it comes to telling people and so, there are several experiments done in which people were asked to generate list which says that what should be the list or what should be the types of features which anybody or any new element in that category should have and which should which should be the most necessary feature which are there people could not come up with that and that was the problem with it right.

So, people were not able to generate the individually necessary and collectively sufficient feature they could not pin point what is individually necessary and what is collectively sufficient and so, that is one of the problems of this particular view or this particular idea of the categorisation model the classical view and so, to explain further or

2 circumvent the problem. So, the classical view another model was proposed and that is called the prototype view or prototype model of categorisation.

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The Prototype View

Like perceptual researchers, conceptual researches believe in the existence of *mental prototypes*, - *idealized representations of some class of objects or events*.

Prototypes of concepts are *features or aspects* that are *characteristics* – that is typical - *of members of the category* rather than necessary and sufficient.

And so, what is this model it says that like perceptual researchers conceptual researchers also believe the idea of mental prototype now remember from lecture on the perception were we thought deal dealt with the prototype view or the idea of prototypes right and this was the bottom one of the bottom of theories and so, we are looking at how prototypes are formed and so, in terms of categorisation also conceptual researchers also think about mental prototypes.

Now, what are these prototypes generally these prototypes in terms of visual researchers the prototype was an abstraction right it had all the all the properties of the particular all the visual properties of the elements which are clubbed together similarly in the conceptual researchers mental prototype are idealized representation of some class of objects and events. So, these are idealized representation now one problem whether classical view was they were never talking about these idealized representation, but this is circumvented with the prototype view were they say that prototypes are idealized representations.

So, idealized representations then may not have all the features necessary or may not have features which are individually necessary and collectively sufficient, but it can also be possible that prototypes may not represent or may not be part of the category itself it could be something else thinking of something else right. So, what would happen is prototypes are basically idealized representation of some class of objects and events. So, these are standards or these are kind of the class or the idealized class.

Now, prototypes of concepts are feature or aspects that are characteristics that are typical of member of the category rather than necessary and sufficient. So, basically what this theory bangs on is the typicality factor what it says is that the prototype you say is that prototypes generally have features the or aspects which characteristically or which define a particular category right and so, if. So, if you want to make a prototype we have to look at several instances of that particular category and from the several instance of category then we will able to basically bring out those things which are common.

So, prototype view is or the forming of prototype is similar to forming commonness among a lot of data and so, there are lots of statistical technique which does that right and so, here also their prototype view forming a prototype view we find the commonness those properties which are shared by most members of the category correct and so, most members of category share a feature that it should be the feature of category.

And so, it could be one feature it could be multiple feature which most member share now it does not specify this thing that it is individually necessary and collectively sufficient, but it says is what it says is that if I am looking at a category and if I am looking at a number of elements in a category and if there are commonalities between them if there are common features between them the commonalities are what sum together to form the prototype.

Now, what do I mean by this. So, the meaning of this is that no individual feature or aspects need be present in the instant photo be count as a member of the category. So, we are not looking at any individual feature right we are not looking at one particular feature which should be shared by all people we are saying that most members have these features. So, not that one feature should not be present in everyone it should be that it could be that most people have a particular feature, but some of them may not have it and so, that could also be a reason for a particular category; for example, prototype; for

example, let us look at cars. Now most cars would have a engine and would have 4 seats right and that is how definition of car is, but how.

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No individual feature or aspect **_need be present_** in the instance for it to **_count as a member of the category_**, but the **_more characteristic features_** or aspect an instance has, the **_more likely_** it is to be regarded as a **_member of the category_**.

.The prototype view of category and concepts **_refers to the family resemblance_** structure of concepts, **_a structure_** in which **_each member_** has a **_number of features_**, **_sharing different features with different members._**

What about the definition of a flying car now when I talk about flying car it does not go or it does not run on the road and so, the sufficient feature that most cars run on a road is exactly not true similarly for the fact that toy cars may not have a engine, but then still they are cars right and so, can be classified under cars and so, this is this these are the variations. So, one of the things is that no individual feature need be present is one of the features that prototype you says to be counted as a member of the category, but the number of more number of characteristic feature or aspects or instance has the more likely they be regarded as a member of the category.

So, basically here we do not talk about one individual feature one defining feature, but we look at more number of characteristic feature. So, it is kind of more the merrier right. So, the more number of features you have which resemble you or which make you present to a category now more typical you are to that category and the more idealized your prototype here right and so, one way of doing it is to look at a number of instance. So, when we are looking at prototyping or when we are looking at how to make a prototype the first thing that that needs to be done is to look at a number of variations of

that category a number of variations of that concept and with that variations find out the commonality right which has the highest commonality.

Once you have that commonality that commonality should be what should be idealized as the prototype or that commonality should be a feature of the prototype because most members have it right and that that is how they are defined now also the prototype view of category and concepts refer to the family resemblance structure of concept they basically go ahead and say that this is kind of a family resemblance structure. So, what is the family resemblance structure a structure in which each member has a number of features sharing different features with different members, right? So, that is the idea. So, a structure where each member has a number of features sharing different features with different members.

So, what would happen is that there would be some commonality, but then each one says other features with someone and so, good example.

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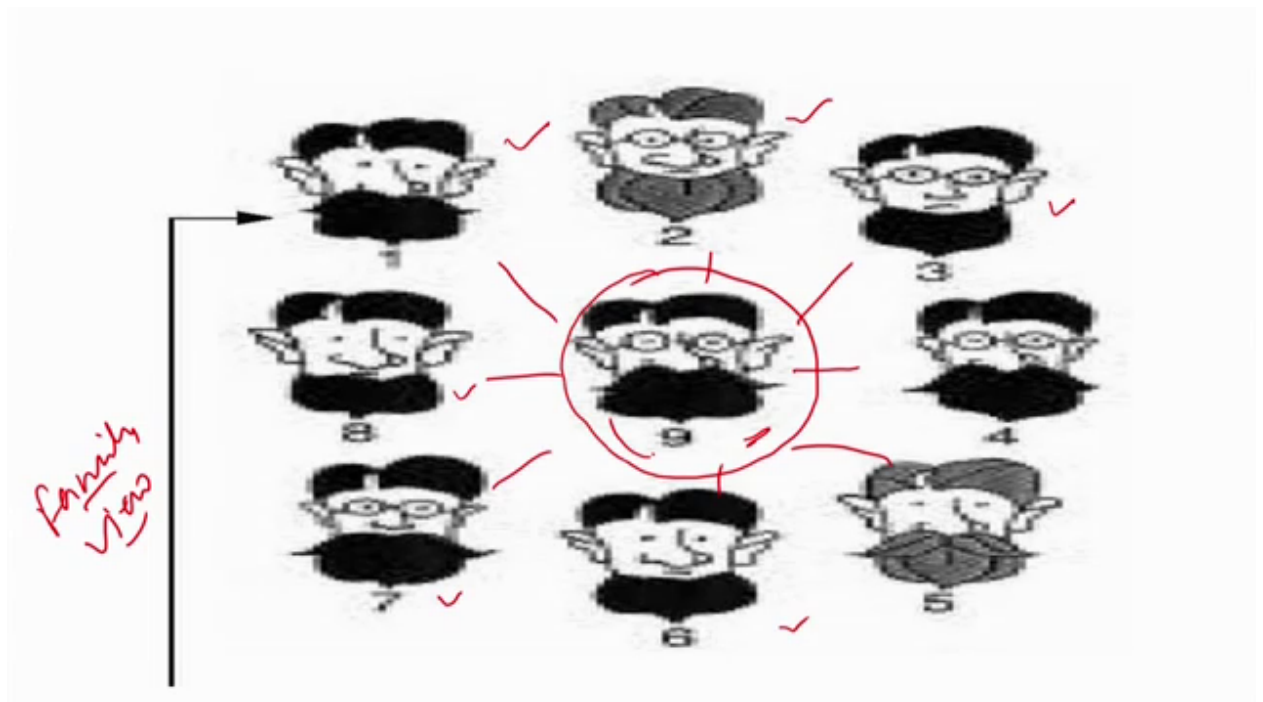
To understand this is look at the central figure nine if you look at the central figure nine the person here he has these moustaches and so, this is the idealized version and it is the idealized version because it has properties from all of these right. So, if you look into all the several variations of 8 different forms of image this is called the family view of

prototyping and so, here what happens is if you look into this person does not has the moustache and so, has a beard and has this eye glasses; this person has a beard, but has a eye glasses, but the colour of the hair is different does not have a eye glass beard and moustache both here it has only beard different colour hair no spectacles with spectacles and so on and so forth.

And so, this is the most idealized version the ninth version is the most idealized version because it shares a number of features with all of them right. So, it is all about commonalities the more number of features that any element share with a particular category the better example it is of that and the better chance instance to be come up prototype.

So, prototype is that particular element which has shares most number of features or which shares commonalities between different-different items in that particular category.

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-A prototype is some sort of *__abstraction that include all the characteristics of a category__* and *__may/may not be actual instance of category__*. Prototypes are often thought of as *__mental "summaries" or "averages"__* of all the instances.

-Concepts exists at many *__different level of a hierarchy__* but one level of abstraction appears *__psychologically fundamental__*. This is the *__"basic level" and different from both higher level (super-ordinate) and lower level (sub-ordinate) concepts__*.

So, prototype is basically a some form of abstraction that includes all the characteristic of a category and may or may not be actual instance of the category. So, it at times what could happen is a prototype is develop, but the prototype is not the actual product right the prototype is not the actual manifestation. So, I may have a prototype of something I

may have an idealized concept of a something, but it never actually becomes category item of the category.

So, prototypes are that kind of a thing right because forming a prototype with that type is not possible right and so, the idealized phone for example, the idea of idealized phone is that they should do. So, many things, but most phones should share this for example, one of the thing that the phone should do is should also be able to teleport you, but that is the prototype right, but phones do not teleport you in real senses.

So, most phones do share other features of a teleporting machine which is your idealized construction of what a prototype is, but then the prototype cannot have an exist as an itself. So, at times what happens is the prototype cannot be demonstrated, but then the prototype is an idealized version of a should have its an idealized version of a category.

Also prototypes are often thought of as mental summaries or averages of instances. So, what that is what I was trying to explain to you what really happens is I look at all the instances and I look at the commonalities and based on that I create a average and the average of all the number of elements which is there that is what the prototype is it is the average it is the exact average and so, average has all parts of it average is related the average point or the mean is related to every element on to on to my data.

And so, basically that is what my prototype is it is a mental average also concepts they exists at many levels of hierarchy what really happens is the concepts say there are different hierarchies example the top level concept the bottom level concept remember the example that I gave you in terms of musical instruments. So, musical instrument is a higher level concept and bass guitar is a lower low concept because it forms or it is coming under the concept of musical instrument right and within the higher dimension of musical instrument is a instrument right and so, these are the different categorisation.

So, basically concept existed different level of hierarchies, but one level abstraction appears psychologically fundamental now in terms of prototypes at the psychological level or at the fundamental level or at the basic level most prototype should have the same feature and that is what it talks about. So, this is the basic level and different from both higher levels sub ordinate and the lower level that is the sub ordinate concept. So, the basic level is that level a which prototypes are formed and the basic level is that level which most items that belong to the category share.

So, basically then this is that level where that feature is there or that feature is shared between all items which are the core feature which is the core feature and remember the dog example. So, barking is one feature which most dogs should have. So, the matter what kind of dog I am looking at whether I am looking at the Chiwawa which is a very very small dog and a Pomeranian which is again a very small dog to the Greden which is a huge dog out there scent Bernard which is again a huge dog and big dog or Rottweiler which is again a kind of temperamental dog and other kind of dogs to be look at Oracion which is a huge dog.

So, all of them then share. So, there are different levels of those prototypes. So, the highest dog the slowest dog, but then the one feature the basic feature is barking and at that they should be able to coincide or that that is the useful concepts then have some kind of a basic level where both there is a difference or at that level they should match.

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Critics of Prototype View

-It fails to capture people's knowledge about the *limits of conceptual boundaries.*

- A second problem from the prototype view has to do with *typicality ratings*

Now, what is the critic of this prototype view now one of the critic of this prototype view is that the limit of the conceptual boundaries now where is the limit of this conceptual boundaries what should be the limit when something should be not referred as a part of the concept or not; example of a concept or a nighteum of the concept and though that is not defined or basically this prototype view then as prototype you say that it is a mental

average and so, any element can enter into it and so, there are no limits and the conceptual boundaries or there are no clear cut boundaries which have been defined by the prototype view because any new item can also share some features and so, where is it that this averaging really works or what percentage of match should the new item have that is not defined and so, there is no limit to this conceptual boundaries.

So, where the limit is to withdrawn another thing is the typicality rating which basically says that what is the extent of typicality for example, this typicality. So, when I say the dog; the let us say about talk about birds now if you go to the west robin would be a typical bird right, but then where for India since people have not seen robin how does robin become a bird or basically people will not think about robin when you say a bird people will think about a crow or a sparrow or some other kind of a bird that you or a sun bird for example, when you think about it.

So, basically then this typicality the idea of typicality rating is another feature which should be looked at and so, what happens here is that as context changes this typicality changes and so, that is not explained by the prototype view because when I say this is the prototype then it should be universal kind of a thing and so, most item should be there. So, that is not explained as concept with the with the changing of context changes the prototype changes and so, it will not be explained and the third interesting view is called the exemplar view and so, what is the exemplar view say it says that concepts include representations of witty some actual instances.

So, it denies the idea that there are mental summaries or there are sufficient individual features which are there and this view goes ahead and says that there is some actual instance or there is some actual representation to which things are compared to which new items are compared and that is how they form into categories and that is how a concept is developed right. So, what this theory says is that there is an example always in mind. So, when I think about something when I think about a car I am thinking of a particular model of a car and that is the exemplar view.

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The Exemplar View

concepts include **_representations of at least some actual individual instances_**

categorize new instances by **_comparing to representations_** *of previously stored instances, called* **_exemplars_**.

difficulty categorizing unclear, atypical instances *because such instances are* **_similar to exemplars of different categories_**

So, categorize new instance by comparing to representations of previously stored instance for example, exemplar example when I when you show me a new car what I will do is my head or my brain has an idea. So, here the prototype is actually in terms of which is existing now the difference is in the prototype view my prototype could be an instance which does not exist which cannot exist, but in the exemplar view it has to exist.

So, when you show me a new car new kind of car what I do is I compare to the idea of a car which I have in the my mind and this idea is actually a a actual instance of it. So, I think of the Maruthi Baleno which I have and I compare it this which any other car and then say whether this item is a car or a truck or a scooter or whatever it is.

So, that kind of a thing is there. So, my mental concept is there or that mental exemplar is there then I will do the comparison and the third thing is difficult categorisation unclear atypical instances because such instances are similar to exemplars of different categories and so, when we have atypical instance how does the exemplar really work. So, suppose let say if I have a bird with clip wings how do I categorize them and so, it is a problem. So, difficult categorizing unclear atypical instances according to this view it is very difficult of how do we categorize atypical incidents into it

So, what are the critics of it the critics it is the prototype view like the prototype view it is too unconstrained its hugely unconstrained in the sense that there are no boundaries

and fails to specify which instance will eventually be stored as exemplars. So, how do I develop the exemplar that is the problem now with the; like the prototype view I do not have boundaries into it and what makes the exemplar for example, the car I possess should be an exemplar or should the exemplar beats the car I desire to possess or should be something else that is not very clear and that is a problem with this particular view also how different exemplars are called to mind at the time of categorisation is also a problem and so, another thing is that I might have seen so many cars.

So, basically the kind of car that I am doing the comparison to for example, the car I possess how does it come to mind how does it compete with all the car that I have known as a comparison standard. So, how do I bring for that standard that is another question which is out there and which this particular view does not explain and so, this is these are the2 critics into this.

So, in today's lecture what we did was we looked at what is categorisation and conceptualisation how does this categorisation and conceptualisation really work and we also looked at the different models of it the classical view what are the problems in the classical view and what are the benefits of classical view also looked at the different prototype view which talks about the mental averages and summaries of making a prototype and how it its cores over there is a the classical view and then we talked about the exemplar view which is basically an instance of the prototype and how that explains or that goes ahead and makes a task easy in terms of categorisation and conceptualisations of making concepts and categories.

Thank you.