The Psychology of Language
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Module No. #01
Lecture No. #02
Animal Communication and Human Language - II

Hello friends, welcome back to this lecture number two, on my series on the Psychology of Language. Now, as I have explained before, in my first class, the idea behind floating a course on the psychology of language, was to make the viewers aware of, how language evolved. The specific reason of choosing language, and expanding on the psychology of language, is the fact that, language is very basic to human beings.

Whatever we are, whatever we do, in terms of cognitive processes, whether it is thinking, talking, problem-solving, decision-making, memory, all of these need to be communicated, only to be expressed, between people. And sometimes, even within ourselves. And, the medium through which, we share these ideas among people, or within ourselves also, is the medium of language. So, basically language is that process, which is integral, or very basic, for cognition to develop.

We may make a memory traces, of a four-legged animal, which barks. By how do we convey, to someone else, of what we are thinking about. The only way that is possible, is through a process of language. Because, that is the medium, through which, different people will understand, that we are talking about a dog. No matter the fact, that these people, may have different names, for the same concept, for the same four-legged animal, which barks.

But, when we communicate with them, we all are able to share the same idea, that I am thinking about a dog, so, whether it is the German Hund, or the English Dog, or the Hindi Kutta, or the Japanese Inu, we are all talking about the same concept. And, that way, we are all able to share the same idea. And, that is how, basic language is. So, we started off the first lecture, by talking about, how language develop.

And, for that, we needed to distinguish, the difference between, a communication and language. So, we started off by looking at, what is communication, and how it is different from language. So, in order to understand communication, we needed to go back, to the non-humans, or the

animals. And, in the first class itself, we saw, how animal communications are developed? How animal communications are in nature? What are the various factors, which govern animal communication? How do they progress? And, what are the need for animal communication?

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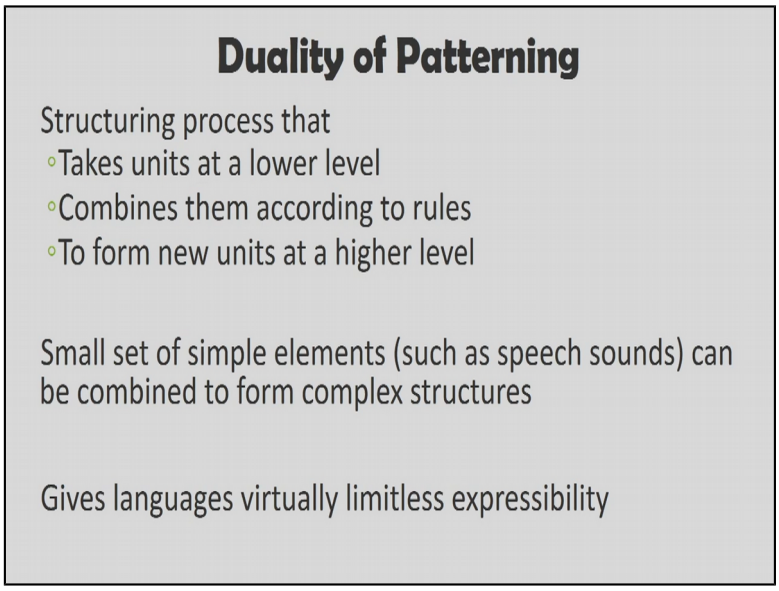

Then, we moved on to look looking at, special features, or special needs of animal communication. We discussed, how animals need a communication system, for finding foods. And, there we elaborated, the idea of the honeycomb, honeybee waggle. We looked at, how animal communication is responsible for finding foe. And, we looked at several distress calls, by either the vervet monkey, or the squirrels.

We look at, how animal communication is basic to, finding friends, and hierarchies within animal systems or animal groups. And, how anima these animal vocalisations and communications, they establish attachment process, within animals, finding friends. And, another reason, important reason, that animals communicate, the reason why the communicate is, finding mates. Because, that is one important reason, of how the species will go further at will, and breed further.

Then, we looked at, certain general features of animal communication. And, that is what we did in, the first part of the lecture. Further to that, we needed to distinguish, how human language is different from, animal language, or animal communication. And, so we started looking at, the idea of human language. We saw laughter, as a human language, as a social language. And, using laughter as a model, we try to see, how animal and human languages progress.

We saw, how human languages are bind by certain features, and what are its characteristic components of a human language. We saw, in that lecture, how many different forms of human language is possible. So, whether it is vocal, or it is manual, or it is a sign language. And, we ended the lecture there, by looking at something called, duality of patterning. So, the basic features of, how human language distinguishes from animal communication was, human languages are governed by certain rules, whereas animal language are not.

So, one of the primary features of distinguishing between, the human language and animal communications are this. Also, it has certain structured components. Human language are structured components. Whereas, animal communications do not have structured mu components. So, a lot cannot be expressed through, animal communication systems. Whereas, human languages have, this property, where a number of information, a number of ideas, can be expressed through them.

Then, we looked at, how certain arbitrary symbols, which bears no resemblance, to the actual object or concept we are referring, leads us to share ideas. And, that is one property of human languages. Duality of patterning we saw, is basically a property, where lower units are combined, with certain rules, to form larger units. And, these larger units then, are able to describe a number of ideas.

Simple elements like, phenomes, morphemes, or words, letters, sentences, are used to form, are combined through syntax, to form a semantic, a meaning, which is expressed among people. So, basic structures, or basic forms, or basic elements, are combined together, to form larger elements. And, that is how, if you look at a sentence, how the sentence is different from, the various words. For example, the sentence, the dog barks.

The dog, who barks in the field, is a yellow dog. If you look at it, each word is different, when it is taken alone. But, when you combine together, the meaning of the sentence will be different from the word itself. And so, this is what is duality of ma patterning, where individual words are combined together, to give a whole new meaning. And, this duality of patterning also gives language, limitless possibilities, or limitless express abilities.

Human language is structured, through a pyramid form. Now this duality prop of patterning that we were talking about is, it uses certain basic pattern. So, what we will start today is, by looking at the paramedical structure, the pyramid structure, that language follows.

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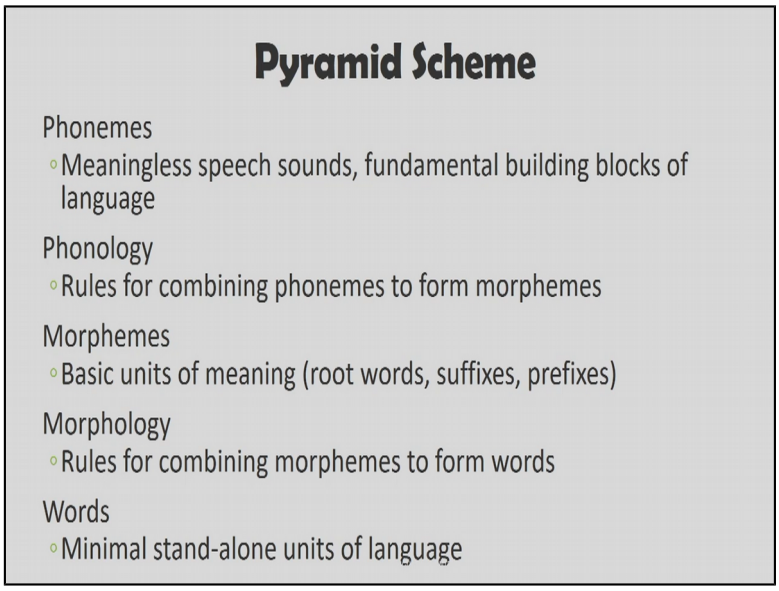

And, what are the basic elements, that language has used. As I said, the basic elements, which combine to form language, may or may not resemble, the actual meaning of the sentence, which is composed of the basic elements. As the basic elements, may not express its true form in the sentence. The sentence, which basically corresponds to the fact, the sentence would mean something else, and the basic elements would mean something else.

So, let us look at, how the human language is structured around. So, the building blocks of human language is, are something called phonemes. Or phones. Phones are the basic speech sound, in the English language. And so, what are phones. For example, words like BA, AH, DA, these are the phones, these are the basic words. So, phonemes are the meaningless speech sounds, which are fundamental building blocks of any language.

So, these are the sounds, which are produced by the vocal cord. And, as we will see, in upcoming lectures, when we look at speech production, we will see, how these phones are produced. Basic sounds, which the vocal cord produce, by vibrating, is what the phones are. Now, these phones, basic sounds, and if you ever see a dictionary, and if you see the pronunciation of any word, it is in the terms of phones, that the world is written.

Look at the dictionary, and look at the pronunciation of any word, and you see the basic phonemes, which are outlined there. Now, these basic sounds, they combine to form, or they combine using certain rules, which are called the phonological rules. So, what is phonology? Phonology is the rules, for combining phonemes, to form morphemes. What are morphemes? Which are, basic units of meaning. Morphemes are, words like noun ending, ING, things like LY, so truly, true and truly, that kind of thing.

So, certain words, certain phenomes, which are combined together, to form certain basic meanings. Morphemes are combinations of phonemes. And so, morphemes are the basic units of meaning. These are the root words. These are the suffixes. And, these are the prefixes. So, any route word, any suffix, any prefix, of any word, are the morphemes. And, these morphemes, then combined together, to certain rules, which are called morphology. So, rule for combining morphemes to form words, are what is morphology.

So, if I have a route word, and if I add a morpheme in to it. So, true the route word, and LY, truly, the word that I am looking at. So, true is the root, and LY is the morpheme, that I am adding to it. So, two morphemes, combine together, form the word, truly. And, that is how, morphemes are all about. So, morphemes then combine together, using certain grammatical sequences, grammatical rules, and these rules are called morphology. And then, we have the words, which are the minimum stand-alone units of a language.

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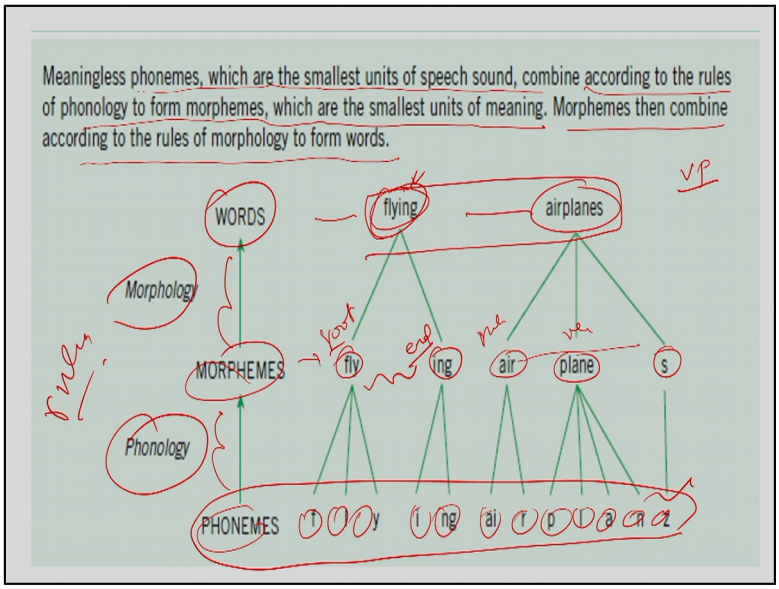

The words, then combined together, to form phrases. So, starting off, we have the phonemes, which are the basic speech sound. These basic speech sound, combine together with each other,

through a certain rule, which is called phonology. This phonology, then combined together, to form certain morphemes, which are meaningless words. And then, multiple morphemes, to combine together to form words. Morphemes are meaningless words.

For example, as I explained, LY or ING, and things like that. And, they form together, to form words. So, suffixes, prefixes, root words, are morphemes. And, morphemes combine together, using the signs of, or rule of morphology. And, from there, we have the words, the actual words, that we are talking about. Now, words, they combine together to form phrases, which are partial sentences, but they can stand alone.

For example, ram ran. If you look at it, ram ran is a kind of a phrase, called the noun phrase. And, so basically, it can stand on its own, although this is not a complete sentence. So, ram ran to the village, is a company sentence. But, if I say ram ran, then itself, means something. It can stand alone, on its own. But, it is not a complete sentence. So, that is what, a phrase is. And phrases, they combine a sentences, or phrases combined together, to form sentences.

So, looking at word, ram ran to the village, ram ran is the noun phrase, to the village, or ram is the noun phrase, and ran to the village, is the verb phrase. And, if you combine together, we will get a complete sentence. So, phrases are basically governed by the letters, or the constituent of language, which it has, and that are complete sentences. So, phrases combined together, to form sentences.

And, the sentences combined together, to form the discourse or language, as we talk about. So, discourse is the kind of conversation, that I am having. The kind of conversation that I am speaking, that I am doing, is composed of sentences. And, these sentences, composed of words. The words are again composed of, some kind of a morphemes. The morphemes are composed of phonemes. And, the phonemes are composed of the phonology.

So, let us look at, this particular diagram. And, if you look into it, meaningless phonemes, which are smallest unit of speech sounds, combined according to rules of phonology, to form morphemes, which are the smallest units of meaning. Morphemes, then combine according to the rules of morphology, to form words. And, if you look in to it, here, the word is flying aeroplanes. Now, this is a verb phrase.

Flying, this is a verb, and so this is a verb phrase. And, so you have flying, or fly in flying, flying aeroplanes. And, if you look into it, at the level of the word, we have flying aeroplanes, at the level of the morphemes, we have fly, which is the root word, and ING, which is the ending, which the suffix. So, this is my morpheme, and the rule, which combining it. Similarly, air is the root word.

Plane is the route word. And S is the ending, which is there. So, combined together, aeroplanes. And, the level of phonemes you have, fly. How they are pronounced, ING. AI and R. Aeroplane, and so, PLA, N and Z. So, this is the level of this. So, my phones combined together through phonology, are used to form morphemes, which are again combined together, to form words. This is morphology.

And, this for phonology. These are the rules. Of course, I have done. I have not extended this, to form. And. This basically, these two combined together, to form the work phrase. We again will form a sentence. So, flying aeroplanes are dangerous. That sentence, and then I can have a discourse. So, it is said, something, something, something, flying aeroplanes are dangerous, that the discourse, which is the more, higher-level meaning of or high-level language.

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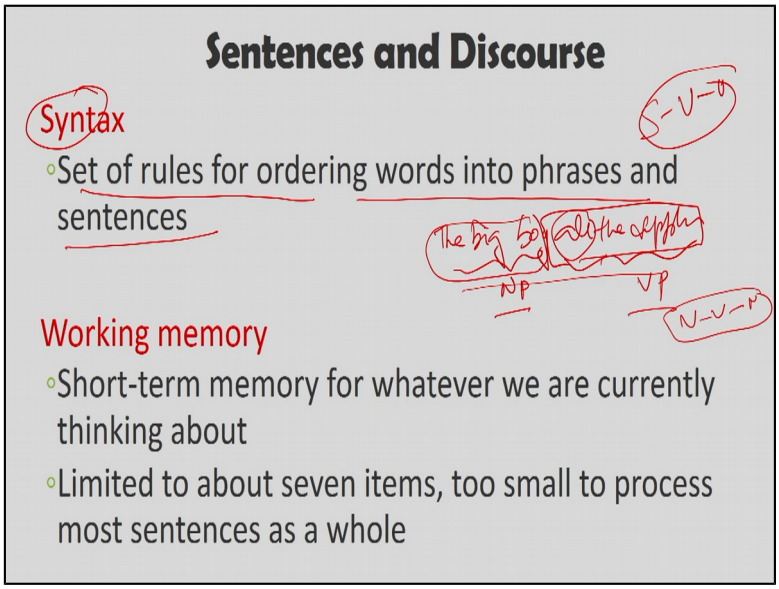

So, how the sentences and discourses, actually work? What are the rules to which, they work? The sentences, the words, that we have, will form sentences, actually use certain rules, which are called the syntax. What is syntax? Syntax is a set of rules, for ordering words into phrases and sentences. So, the big boy ate the apples. If you look into here, the big boy is the noun phrase, and ate the apple is the verb phrase.

It is, ate the apple, can stand alone, alone on its own. The big boy, can stand alone, on its own. And, so this is the noun phrase, because starting with the noun, this is starting with the verb, and so on and so forth. And, the rule, that the subject, verb, object, structure that it is following, or the noun, verb, noun, pattern that it is following, is what is called is called a syntax. So, syntax is basically the rule, for ordering words into phrases and sentences. If I say, a big the boy, is not going to work. So, there is a particular format of using it, and that is what a syntax is.

Now, this form, if you look at it from a cognitive psychology perspective, this way of organising, the words into sentences, uses something called, working memory. So, short-term memory. What is working memory? It is a short term memory, for whatever we are currently thinking about. So, if you look at, how the phonological loop, works in working memory, what happens is that, when you hear a word, the central executive brakes the word, into its constituent parts.

For example, what is a noun? What is a verb? What is the noun against the subject and object in verb? And, that is what is repeated, in between words. For example, conjunctions, and interjections, and other words, which combine, or determiners, these are not, what is processed by the phonological loop. And because, thee these words, these grammatical words, which follow rules automatically are used.

And so, short term memory, or working memory, just loops the basic words, the basic operator words here. And, the operator word is the, as I said, the subject, object, and verb. And, that is what is enough, for describing any sentence. So, working in limited to about seven. What is working memory? It is a short term memory, or whatever we are currently thinking about. And so, what it does is, it takes an information, whenever you speak a certain word. These words are, taken away by the working memory.

In what sequence, they should appear, that that is basically, what the working memory keeps. These words they keep, and out of that, the meaning is generated. Also limited to about, seven, plus or minus two items, too small to process most sentences as a whole. And so, what working memory actually does is, it does not process the sentence. What it does is, it looks at the operator words, and the constituent words. And, based on that, it is able to generate the whole sentence, or generate meeting out of the sentence.

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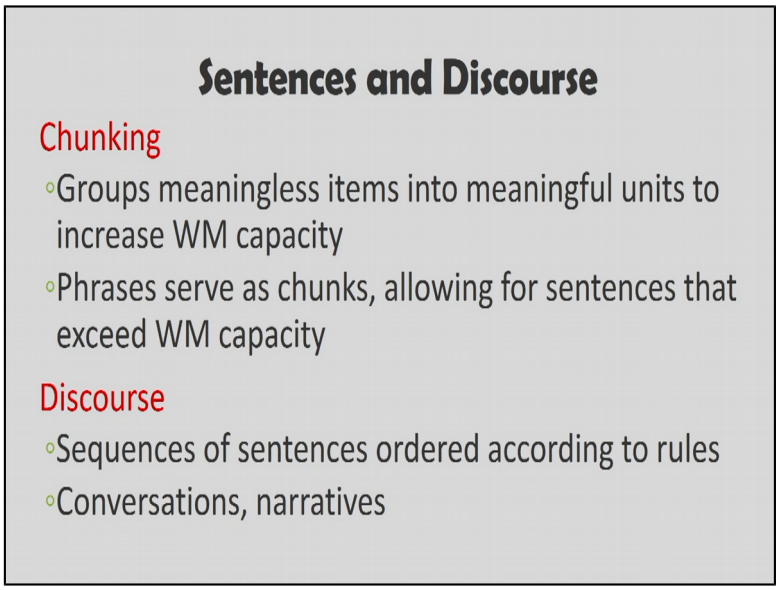

How does it do it? It, do it through the process of the working memory, works with the process, something called chunking. And so, what is chunking? Groups of meaningless items, into meaningful units, to increase working memory capacity. And so what it does is, if you narrate a complete sentence, what the working memory is going to do, is take out the subject, verb in object, the operator words, the connector words, the relational words and the operator words, and basically then, it will loop it together.

And, later on, when it is finding the sentence, it will try to bring the word order together, or pre predict the word out, and from there, it will be able to generate the sentence. This way, it can actually group, listen to a number of sentences. Whenever you are reading, it is not that every word you read, you only read the operator word, and relational words. That is how, you read.

And so, what it does is, the working memory chunks them together. It categorises words together, in terms of relational words, and operator words. And, that is how, it is able to hear so many words, or receive so many words, and process so many words. Phrases serve as chunks, allowing for sentences, that exceeds working memory capacity.

And, so one way of chunking is, breaks the whole sentence into certain phrases, the noun phrase, the verb phrases, the participle phrase, and so on and so forth. What is this course? Sequence of sentences, ordered according to rules, which is conversation and narratives. So, what is this course is? The sentences, when they are arranged to a certain rule, or certain sequence, and which leads to conversations and narratives are, actually what are discourse.

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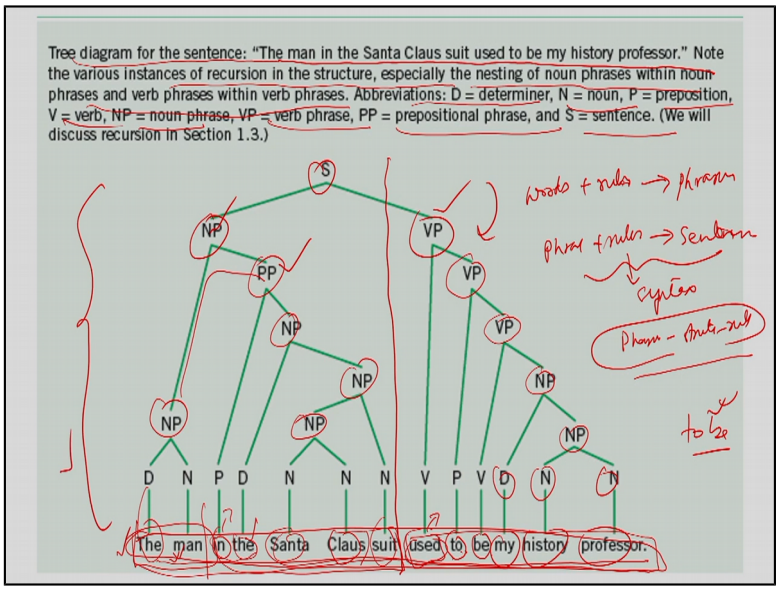

So, the human, the human language is basically built up, of a hierarchical structure. Now, as we saw that, working memory is responsible for, doing this word reading, or understanding this word reading. Now, let us look at, how a simple sentence, the man in the Santa Claus suit, used to be my history professor, is basically perceive, or is basically broken. What is the rule, or what is the syntax, which is used for, processing this language?

So, basically what happens, in human languages, the rules that are there, is that, you have words. And, these words follow certain rules, to form phrases. And then, the phrases, they follow certain rules, to form the sentences. These rules, are exactly called the syntax. And, these are the phrase structure rule. So, one phrase structure rule is, what we have, here. As we look at the tree diagram, for the sentence, the man in the Santa Claus suit, used to be my history professor.

Note the various instances of the recursion in the structure, especially nesting of the noun phrases within the noun phrases, and the verb phrases within the verb phrases. Abbreviations: D is the Determiner, N is the Noun, P is the Preposition, V is the Verb, NP is the Noun Phrase, VP is the Verb Phrase, PP is a Prepositional Phrase, S is the Sentence and so on so forth. So if I look at this particular sentence, the man in the Santa Claus suit, used to be my history professor, how does it actually get arranged, how does it actually get, built up.

Now, this basic way of breaking the sentence, into in constituent parts, is called the phrase structure rule. So, this is my complete sentence. And then, the sentence is broken down in to,

two constituent phrase. The two constituent phrase is the noun phrase and the verb phrase. My noun phrase is, this part of the sentence, which is, the man in the Santa Claus suit. This is my noun phrase. And then, I have my verb phrase.

Since, this is the operating word, verb, if you look into it, if in the complete sentence, this is the operating verb, the word. And so, used to be my history professor, is my verb phrase so, within the noun phrase, then I have, several other phrases. The man in the Santa Claus suit, can be explained, as following a rule, in which the noun phrase, the man in the Santa Claus suit, can be further broken down into its, constituent sentences.

One way of looking at is, the man is, one phrase, in the Santa Claus suit, this can be one phrase in itself. And, within that, the Santa Claus suit itself is one phrase, or I can have Santa Claus is one phrase. And so, I can absolutely see, this is the noun phrase, this is the noun phrase. So, Santa Claus suit is one noun phrase. Santa Claus is one noun phrase. And, within that, you have the Santa Claus suit, is another noun phrase.

If you look at, in the Santa Claus suit, it is again a noun phrase. Now, phrase meaning that, it can, these, these group of words, can stand on its own, can have individual meaning or can stand on its own, or can have sure meaning. So, looking at it, then my first break, or my first division in the sentence, is the man. And, if you look into it, the, is the determiner. Because, it is the first time, the noun is introduced, and so I am using, the. And, man is the noun. So, the man can stand on its own.

Similarly, this noun phrase, is then broken on into its prepositional phrase. The prepositional phrase being, in, and then my noun phrase. So, in, is the preposition, which I have. So, anything following, in, is the prepositional phrase. And, from there on, I have another noun phrase, which has the determinant, the, and then the noun phrase, Santa Claus suit. Now, even the Santa Claus suit, can be broken down into its two noun, the Santa Claus, and then I have the suit, so it is three nouns, and that is how it is broken.

Similarly, my word phrase, starts with the verb, used to be, as it is known. And so, if you look into it, this verb phrase, is then broken down into verb prepositional phrase. Because, to is a preposition, that I am using here. And so, to, the used to, right. And then, this to, is again broken

down into another verb phrase, which is, since be, as I said to be, is another verb, which is there. So, to be my history professor, so, be.

And, within that, I have a noun phrase. Which has a determiner, MY. And then, a noun phrase. We have two nouns, history professor. And, so that is how, the whole sentence is broken down. So, it has basically, noun phrases, verb phrases, participate prepositional phrases. And, that is how, the sentence is broken. And so, this was just to give you an idea of how, grammar really works, or the rules of grammar, in forming the sentence, actually works. So, basically then, discourse is the language structure, consisting of sentences, that are ordered, according to a particular rule.

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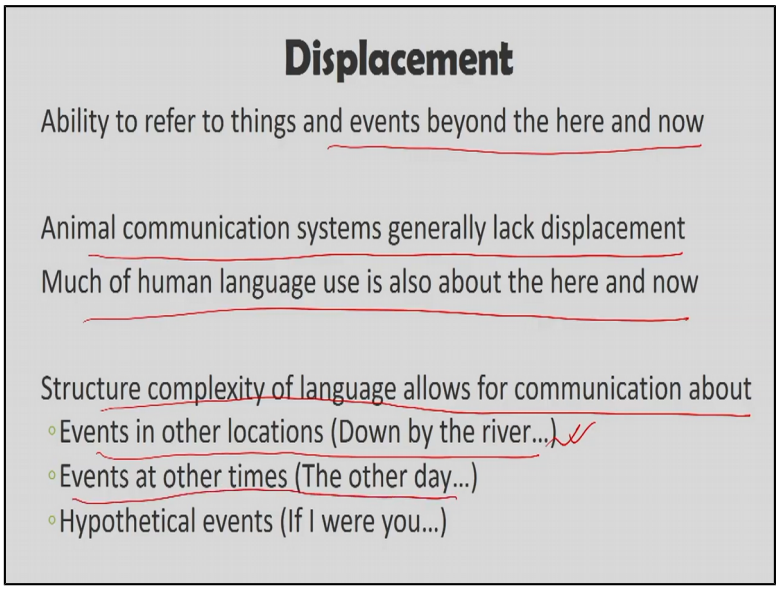

Now, while animal communication systems, are always about here and now, they talk about things which are, if you saw the wiggle dance, or the call that vervet monkeys were actually doing, they were talking about things, which are here and now. But, human language systems, talk about future, and can talk about past. And, that is one another thing, interesting thing. Human language, they allow us to talk about events, which happened in the past, or other, at other times and places.

And, this basically is called, the displacement principle. And, that is not common with, animal system. So, the ability, to refer to things and events, beyond here and now, is a property, which is only present in the human language. Also, animal communication systems, generally lack the displacement. And, animal communication system can talk only about, here and now. At the very basic, if you look at the un the honeybee waggle dance, it can talk about, a little bit from

the past, where it tells the other bees of, where it is, from the past, it has found the reserve of the honey.

But, that is the all, it can do. Much of human language uses it use is about, here and now. Now, structure complexity of a language, allows communication about, so this displacement, or the structural complexity of human language allows about, to talk about events in other locations. For example, down by the river. So, it basically says that, somewhere else, the event that I am talking about is, not happening here, and now it is happening somewhere else, at some other place, by some other things.

Similarly, events at other times, the other day. When I am talking about the other day, it means that, some event in the past, that that has happened to me. Or, hypothetical events, for example, if I were you, so this kind of thing. The animal's communication system cannot talk about, but human communication systems can very well do that. And so, I am talking about, hypothetical situation, or future situation where, me becomes you, kind of reposition is there, where I can think about, where I am proposing something, which is not possible.

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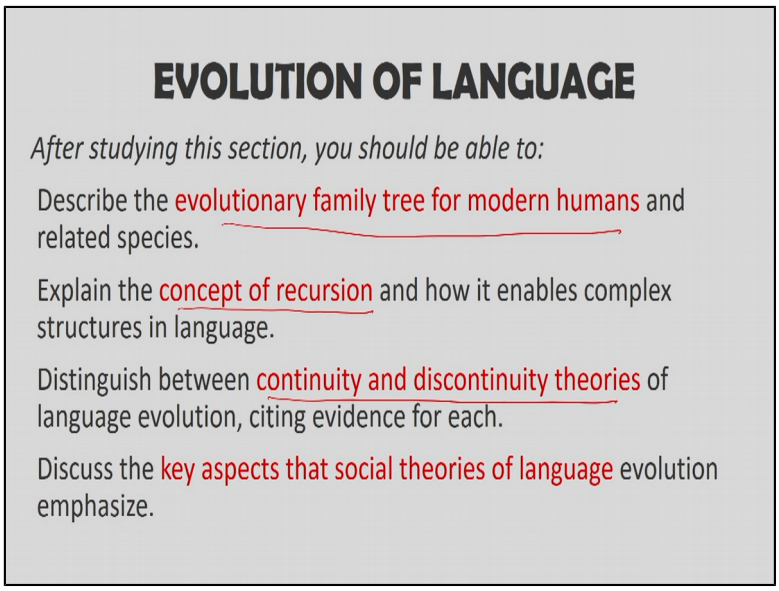

So, how did human language, or language for that matter, evolved. And so, in this section, what will do is, we will describe the evolutionary family tree of modern human language, and its related concepts. We will look at the concepts of the recursions, which are believed to be, how complex languages actually propagated, or started.

We will look at the, continuity and discontinuity theories of language evolution. Fa the two basic theories, one says that, language has evolved, over a period of time slowly. The discontinuity theory says that, language evolved from, one modification, or one iteration, from the language evolved, very rapidly. And then, we will discuss the key aspects of social theories of language evolution.

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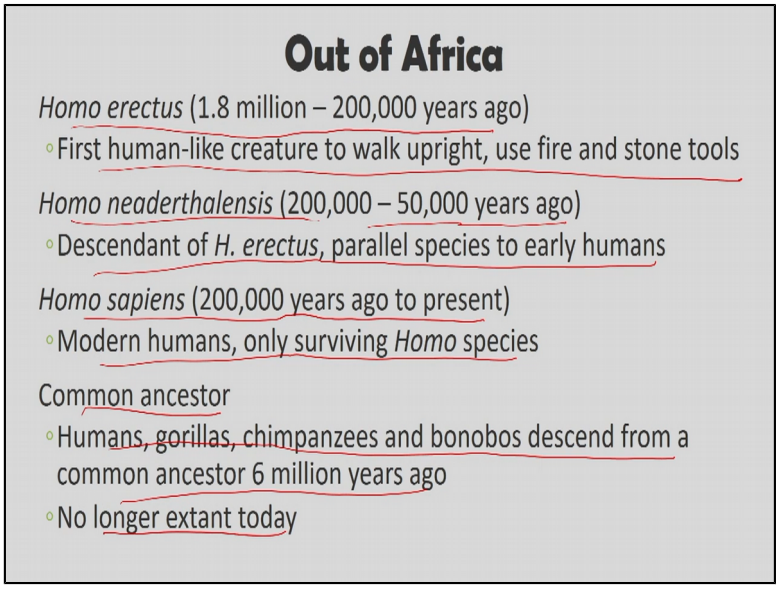

So, very quickly, how did language evolved? It is believed that, the Homo erectus, which is 1.8 million years, some 200, 200,000 years ago, they develop. And, first human-like creatures to walk upright, using fire and stone tools. So, they had a language. So, humans and chimpanzees, share a common ancestor, which is the Homo erectus. And, they share a common, the Homo erectus was the ancestor for, both the neaderthalensis and the modern humans.

So, Homo neaderthalensis, which are 200,000 to 5 to 50,000 years ago. They are descendant of, human erectus, and parallel species of early humans. Now, the languages, that the animals were using, was a kind of a proto-language. So, it is a kind of a pseudo language, which can express meaning, but not the form in which we can do, which the modern human beings can do. Now, Homo sapiens, they were 200,000 years ago, to the present. And, modern humans, only surviving our Homo species.

So, common ancestors are, the humans, gorillas, chimpanzees, and bonobos, descended from a common ancestor, some 6 million years ago. And, they are no longer, extant today. So, humans evolved, following evolution, following the evolutionary ladder. So, we started with, Homo erectus, then Homo neaderthalensis, then Homo sapiens, and from there, the human beings.

Ah they move through the ladder of the selection of species. And, we evolved from there. Now, species do not evolve from, one another. It is generally believed that, the species do not evolve from one another. Rather, populations that were once, single species, they split into two. And, these two, adapt to new environments, forming newer species.

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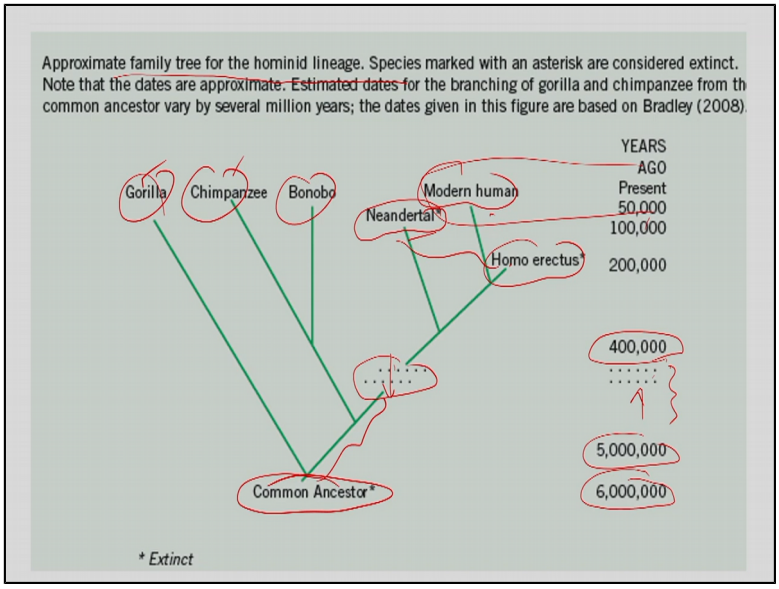

So, if you look here, approximate family for the hominid lineage. And, these are, what it is. So, this is the common ancestor, that we all had, some 6,000,000 years ago. And then, within the 5000,000 years, we have these gorilla coming up, and then the chimpanzees. And, there is a break here, within the 400,000 period. And so, you do not see, any development. We do not know, what happened in between here.

And then, the bonobo was along this period only the development. And, this period has nothing. Then, we have the neaderthalensis man, and the modern humans, and the Homo erectus. And, the present is what we have, the modern humans. And, the common ancestors are, these two. Although, gorillas and chimpanzees are also common ancestors, for both of these. Now, how this language developed, is another.

So, one-way that this language developed was, that single species split in two, two and many species, and they adapted to new environments, giving to rise to different languages. Also, inter-breeding reveals, that if two populations, are from the same species, and so they develop. Inter-breeding was another reason, another confirmatory reason, that one single species, they moved to different locations, and that lead to different languages being, developed.

Homo erectus are the first successful species. So, 200,000 years ago, Homo sapiens arrive. And, neaderthalensis arrived around 400,000 years ago. Similarly, 50,000 years ago, the stone age, we had the African Homo sapiens. And, by 400 4,000 years ago, neaderthalensis in Europe, they arose. And, so basically, this is the chart of how, human beings evolved from, the chimpanzees and gorillas. And, how language would have been, how a language would have been, processed or progressed.

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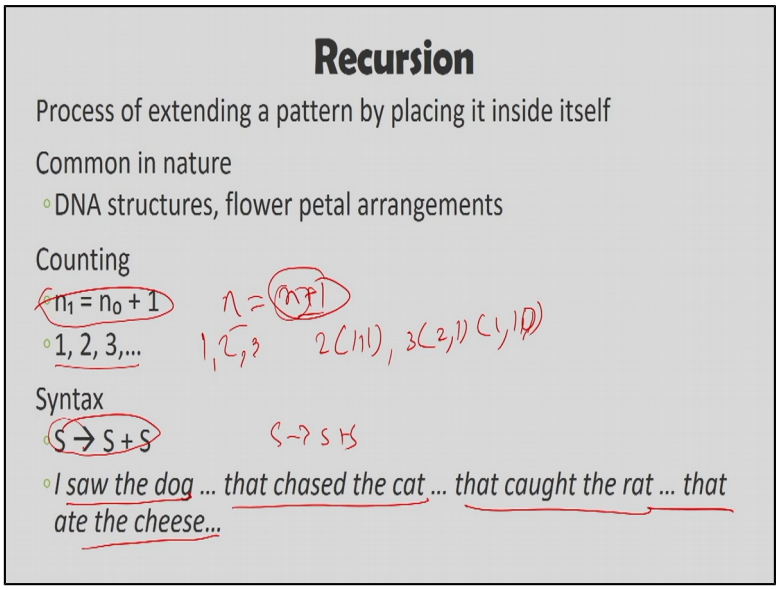

Now, one of the interesting thing, in the evolution of language, or one of the interesting properties of language, is the property of recursion. Recursion is a basic property of language. And, what is recursion? Recursion, or the process of extending a pattern, by placing it in inside itself, is an important feature of human language. In particularly, a human thought, in general. So basically, this property says that, we take a particular thought, or we take a particular pattern, and we keep on placing the pattern within itself.

And, that is how, the language actually extends, our language actually develops. If you look into, the way I explain to you, if you look in to your, this this noun phrase, and there is the prepositional phrase, again we have noun phrase. And so, within the sentence, I have the noun phrase, the verb phrase. And, within the noun phrase, I have the noun phrase, and the prepositional phrase, and the noun preposition.

So, what you see here is the recursion, that is there. Particular way, a particular format, or a particular pattern, is taken, and is repeated within itself. And, that causes, language to flow. So

basically, what is recursion then? Let us have a look at it. The process of extending a pattern, by placing in itself, is basically what is called recursion. Now, this is, you can see this, very common in the structure of DNA, or in the flower pattern arrangements, and so on and so forth.

So basically, what happens is that, if you look at, if you ever look at cauliflower, what you actually see is that, the same pattern, actually keeps on extending, and to various limits. Or, if you look at leaves, they have the same pattern. And so, that is what is, the idea of recursion. It is the same pattern, that have the same basic structure, is being repeated, again and again, and that forms the complex structure, which is out there.

Now, in mathematics, this is explained in terms of counting, for n 1, is basically always, n0+1. So, n, if there is any number, and it will always have a number n+1, which is greater than n, and it will have the same n. And, this is the recursion. So, example, if you look at 1, 2, and 3, 2 will always have 1 and 1, which is added together. And, 3 will have 2 and 1 one way, or it could have, 1, 1 and 1. So, the basic structure 1, is what is being repeated. And so, this is what is called the, recursion policy. In terms of language, you have the syntax.

For example, you have the sentence. Each sentence is combined up of several sentences. For example, look at the sentences. So, this kind of things, with children play with, to make larger sentences. For example, look here, I saw the dog, and then somebody has another, that chased the cat, that caught the rat, that ate the cheese. And so, the sentence will be, never ending. I can make a never ending sentences, with this kind of a recursions. What I do is, the basic pattern, a noun phrase, a verb phrase, or some other phrase is taken, and is repeated inside, with recursions, with so many iterations, and that is how, language is actually made up of.

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Now, this particular thing, is very akin, to the idea of Russian dolls. If you have ever seen Russian dolls, and these are known as the Matryoska, which provides a concrete example for recursion. If you have seen this, if you travel, if you are in Moscow, or somewhere near the, you get a porcelain doll kind of a thing. And, so the idea is that, doll within a doll. So, you will have a similar, this doll is similar to this doll, only smaller in shape. And so, you are at the smallest doll. So, it is a doll within a doll, kind of a structure.

So, each doll resembles the others, but one fits inside another, those inside a third and so on and so forth. Likewise, a language we can nest sentences into each other. And, this is a unique aspect of human language, as a communication system. So, we need not have multiple parts of it, we need not have multiple versions of it, we can nest the same sentence, or we can nest the same phrases, same pattern, and form a language, or a medium of communication.

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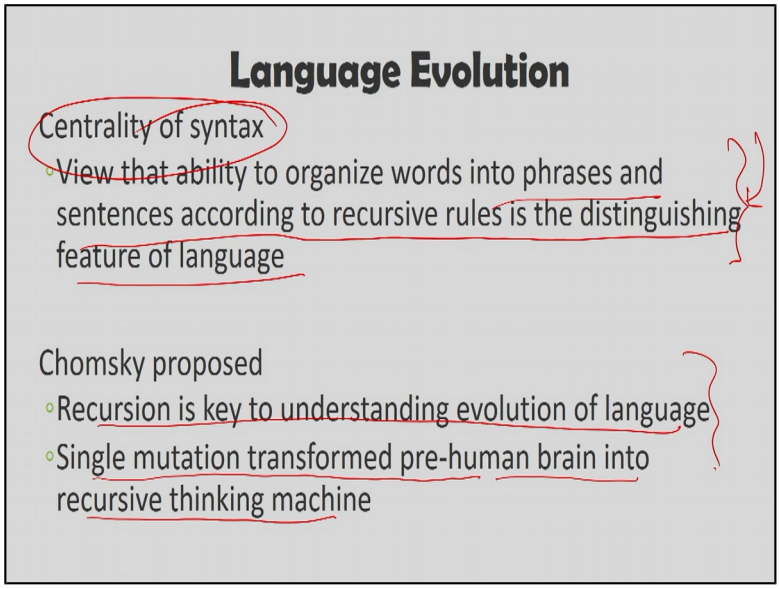

Now, according to Noam Chomsky, 2011, recursion is the key to understanding, how human language evolved, from the primitive structures. So, if you want to see, Noam Chomsky believes that, if somebody wants to see, how languages have actually evolved from primitive structure, the basic answer to that, lies in terms of recursion. Recursion is the way, which shows how primitive a proto language is, that that the chimpanzees have, how they progress into the way, the present language is.

So, Chomsky emphasises, the centrality of syntax concept, and which is here. The ability to organise, words into phrases and sentences, according to recursive rules. So, Chomsky believes that, language evolution happens through, centrality of syntax. Now, views that ability to organise words, into phrases and sentences, according to recursive rule, is the distinguishing feature of language.

So basically, what Chomsky believes is, the centrality of syntax, is basically, one of the primitive evidences, that how language would have evolved. Now, Chomsky what he proposed is, recursion is the key to understanding evolution of language. Also, single mutation transferred transformed human pre-human brain, into a recursive thinking machine. And, that is what, Chomsky believes. The question, whether human languages evolve, gradually or rapidly, is known as the continuity debate.

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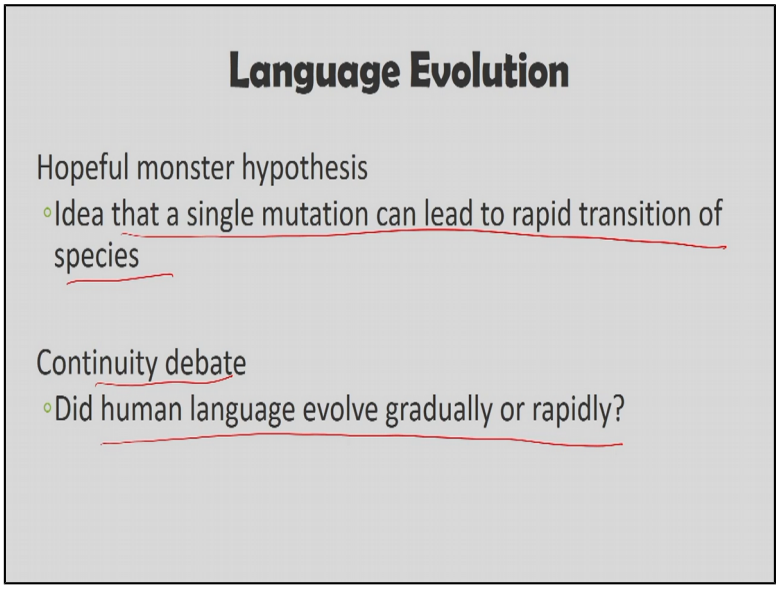

Another thing that, that is there is a continuity debate. Now, hopeful monster hypothesis. What it believes is, the idea that a single mutation, can lead to rapid transition of species. And, the continuity debate is, did human languages evolve gradually or rapidly.

Now, on one hand, we have the continuity debate, which believes that, whether language would have evolved continuously, through a progress, through progress of basic language structures, or rapidly through one mutation of a language, and one mutation of gene would have produced, a different brain, and the recursive idea of language would have developed a language. Evidences for this continuity, there is a discontinuity theory also. And, this evidence for this discontinuity believes that, there is a specific language impairment in the KE family.

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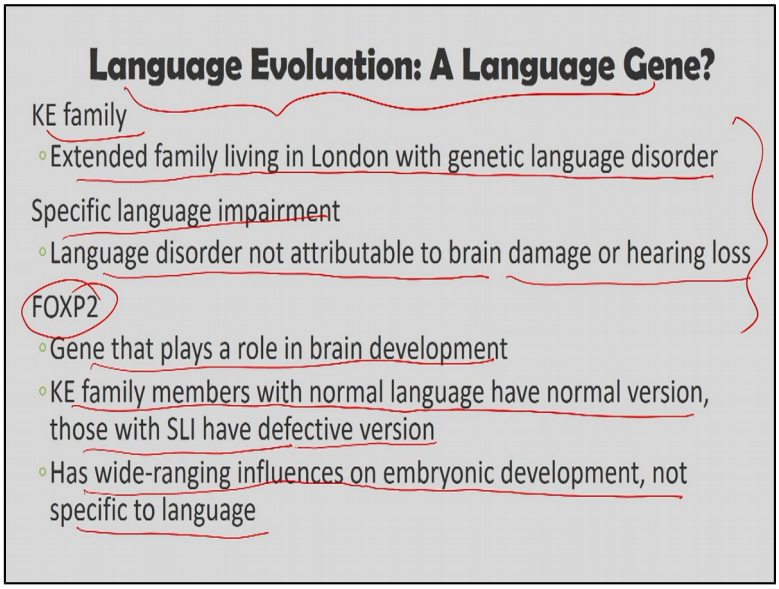

So basically, language evolution. So, whether language evolved, out of continuity, or discontinuity. It basically means that, whether language evolved slowly or fast, from proto languages, from basic languages, and through recursive properties, it came to the present form, which is there. Or, the discontinuity theory believes that, there was one simple mutation, there was one basic mutation. And, because of this mutation, the whole language system develops.

It is not recursive in language, or it is not slow or fast, or it is not progressive. And so, the evidence, that the discontinuity theory places, that language is not continuous in nature, it is not developed, out of a continuous process. And, the evidences that they provide, is the specific language manipulation of the KE family. Now, the KE family evidence, which says that, extended family living in London, with a genetic language disorder.

So, one group of psycholinguist, they looked at this family. And, what this family had is, the specific language disorder. And, this languages order was not actually happening, due to any brain damage. What was happening, is a particular gene was mutating in a way. And, because of this mutation, every species, or every member of that family, was facing the same problem.

And so, basically, they provide, this evidence for the discontinuity theory, which states that, language did not progress, as an odd language did not develop as a progressive step. It developed, out of a discontinuity function. So, at one point of time, a single mutation happened. And, because of that, language developed. It is not a recursive feature, it is not a progressive feature, which Noam Chomsky believes it to be.

Now, specific language impairment. Languages disorder, not attributable to brain damage, or hearing losses. And, they found something called, a FOX P2 gene, the gene that plays a role in, brain development. And so, they found out that, this gene was the mutation. Mutation in this gene was, what the disorder was happening in this particular family. Okay.

Now, KE family members, with normal language, have normal version. While, with SLI have deficiencies version. So, this FOX P2 gene in the KE family, those members of the KE family, which had the normal gene, was having normal languages. But, those members of the family, which were having a mutated gene, they had this defective version

Now, as a high it has wide-ranging influences on embryonic development, and not specific to any language. Later, it was found out, that this FOX P2 gene, was not the reason, how language would have developed, or discontinuity theory is not the, may not be the right theory for proposing, how language would have evolved.

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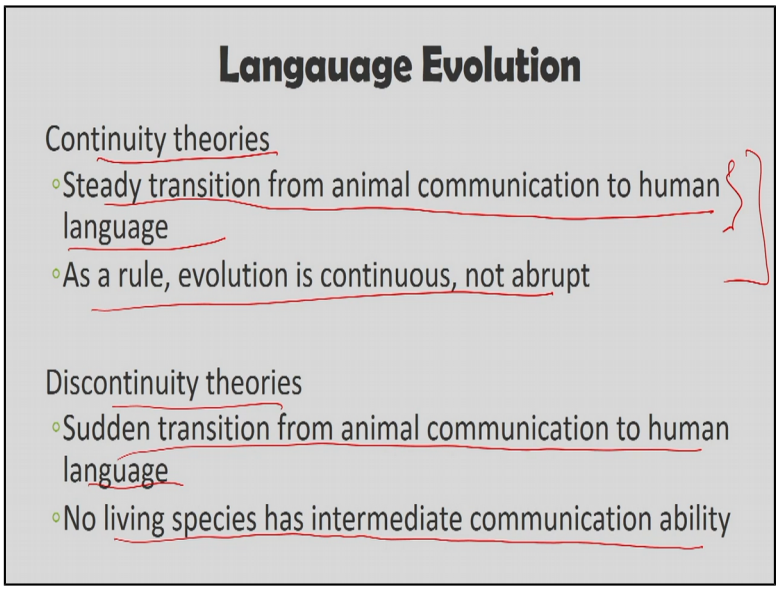

Now, on the other hand, on one hand we have these discontinuity theory, which says that, with single mutation, language would have evolved. It is not a continuous process, it is not an evolutionary process, it is not a recursive process, through which, language has developed. On the other hand, we have the evidences with the continuity theory. The continuity theory says that, these theories are consistent with the principles of natural selection.

So, continuity theories steady transition from, animal communication system to language. And, so this theory says that, language development is continuous, and it became, an either rapid, or

slow. This develop through the process of, continuous evaluation, or continuous regeneration of the language, continuous development of the language. As a rule, evolution is continuous, not abrupt.

And so, they believe that, the continuity theory believes that, the language developed as a, continuous process on a continuum. The discontinuity theories believe that, sudden transition from, animal communication to human language, has been there. And, no language species have intermediate communication ability. So, there was no intermediate communication ability between people.

The existence of pidgin, which are kind of languages, which is not a true language. For example, pidgins are languages, which a group of people, who speak different language, they come together, and they want to share ideas between them, they develop a language is called pidgin. So, when the English people went to China, they had gold and silver. And, the Chinese had a market of porcelain and tea.

The English people did not understand these people. But, they developed a medium of communication, on themselves. And, this medium of communication, is a good example of pidgin. So, what are pidgin? Pidgin are form of languages, which are very basic. It is a very basic form of language. And, they have very few, what to say, expressions, very few words, and through which, express language is expressed.

For example, no can do. If you look at this, this is a kind of language, one day, two day, three day, going today, going yesterday, that kind of thing, is an example of pidgin. So, one evidence for the continuity theory is the, evolution of pidgins. And, the existence of pidgins, we suggest that, the possibility that pre-human spoke, a proto-language, halfway between animal calls, and a full language.

The pidgins, the existence of pidgins, or the generation of pidgins, as a language system, basically, this provides enough evidences, that the primitive humans spoke a primitive language, which is called the proto-language. And, from there, the natural language, that we presently speak, has evolved.

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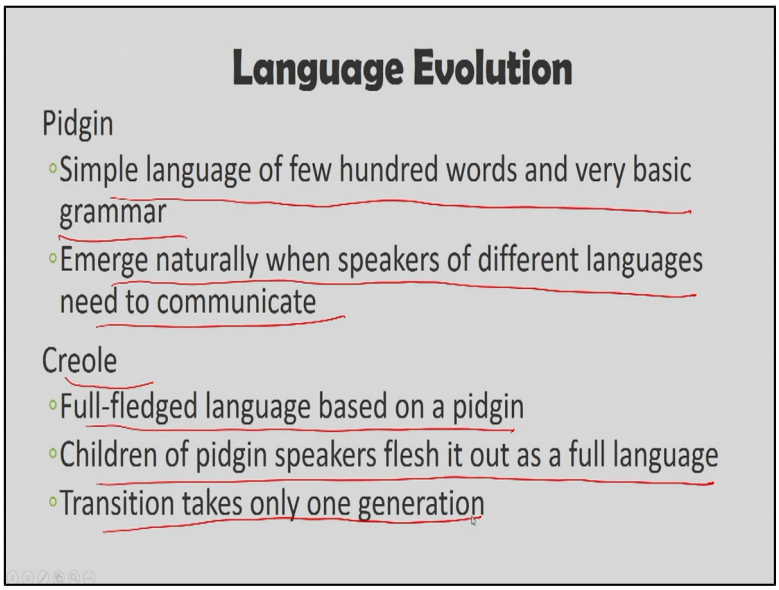

So, what are pidgins, then? Pidgins, as I said, are simple languages, of few hundred words, in a very basic grammar, and emerge naturally, when speakers of different languages, need to communicate. Right. Also, the creole is another form of a language, which is there. So, the children of people who speak pidgin, they develop a fully developed pidgin syntax, which is called as creole. It is a full-fledged language, based on a pidgin. Children of pidgin speakers, flesh it out as a full language. And, transition take place, only in one generations.

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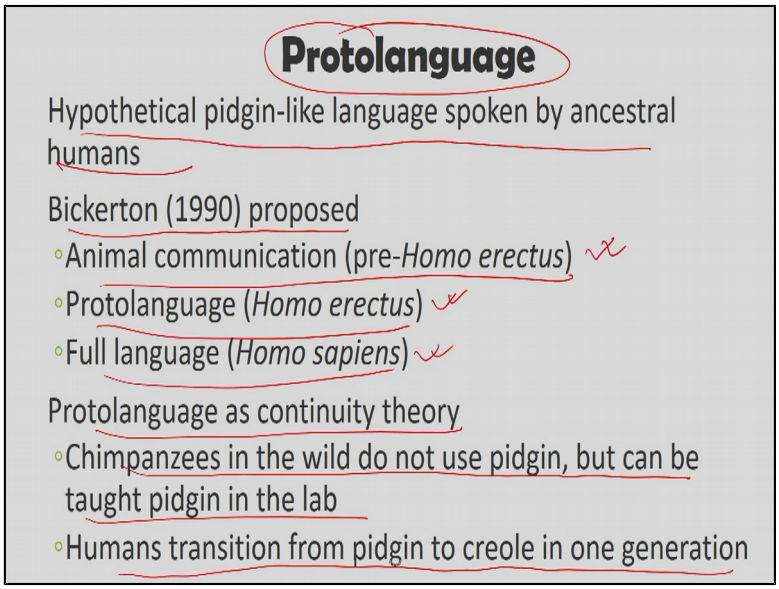

This is the evidence for the fact that, language is actually follow continuity theory, or language production were continuous. Now, protolanguage. Protolanguage is the language, that it is the continuity theory believes, that primitive humans used to speak. How was this, if hypothetical

pidgin-like language, spoken by ancestral humans. Bickerton, in 1990, proposed that, animal communication was pre-homo-erectus, protolanguage was Homo erectus, and full language were developed by Homo sapiens

Similarly, proto-language as continuity theory, chimpanzees in the wild, do not use pidgin, but they can be taught pidgin in the lab. So, several experiments have been done, with chimpanzees. And, they were taught, this pidgin language. Pidgin language is basically, as I said, is a very basic language, with certain kind of word, to express certain kind of idea. So, they are not full-fledged language. No grammar, no perfect grammar, no perfect syntax. Our human transitions from pidgin to creole, in one generation, is also the reason for, or also the evidence for, the debate of continuity theories.

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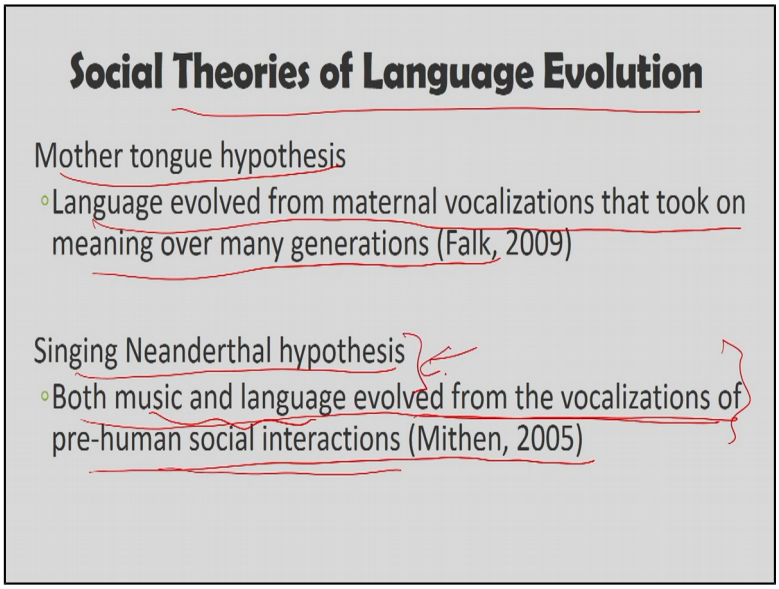

Now, there are certain social theories of language evolution, beside the continuity and discontinuity theories. And, what the theory says? Mother tongue hypothesis. What is the mother tongue hypothesis? Language evolved from maternal vocalisations, that took on meaning, over many generations. So, social language theories of evolution say that, the special nature of mother-infant interactions, lead to the development of, the language, which is there.

The relation between, music and speech, is another evidence, which is there, in the role of conversation in building and maintaining social relationships, are the reason, for this kind of social learning theory. Now, singing Neanderthal hypothesis. Both music and language evolved from, vocalisations of pre-human social interactions. And so, the singing Neanderthal

hypothesis states that, language and music, they evolve from vocalisations of pre-human social interactions.

So, basically then, at one basic level, both music and language are the same. And then, they diverge. Because, at the level of divergence, where they are connecting together, this is where they are coming from, the Neanderthal.

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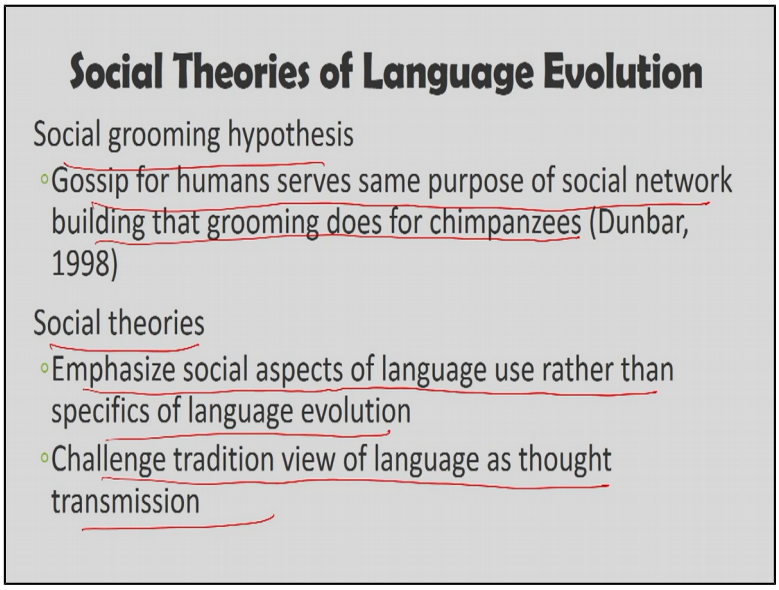

Also, social grooming hypothesis, what it says is, gossip for humans serves the same purpose as social network, building for the grooming of chimpanzees. And so, social grooming hypothesis is another hypothesis, which says that, there is a continuity theory, there is a continuous phase in which, language are developed. Also, social theories emphasises, social aspects of language use rather than, specific language evolution. And, challenge tradition view of language, as though to be, a transmission.

So basically, then there is a social learning theory of language, which says that, there is certain kind of evidences, from the social structure, from the social grooming hypothesis, and mother-infant relationship suggest that, language came as a social development. There are other theories, which are the continuity and discontinuity theories, which says that, either language develop in a continuous form, or language develop out of one mutation, one single mutation, and through the whole of, language actually develop.

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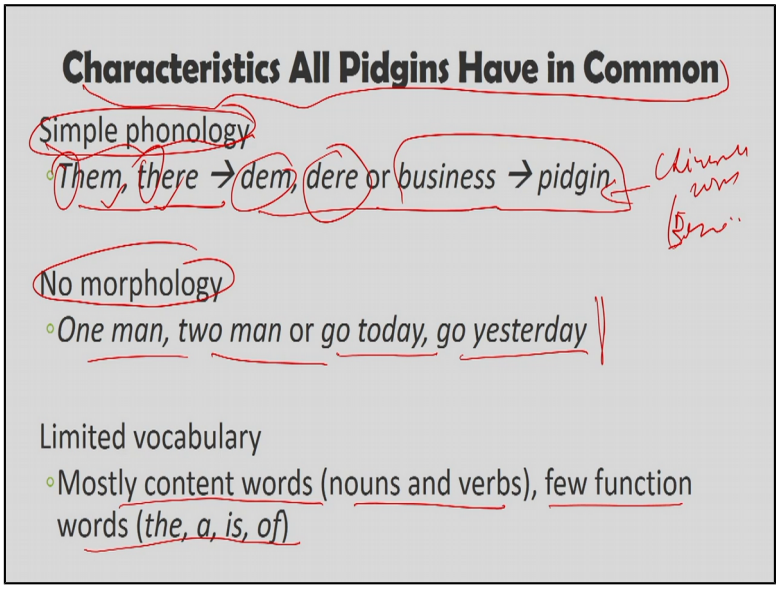

And so, we come to the point, where we actually have, to say, to make you understand, how living fossils are there, or what is the evidence for the fact that, languages have developed, from the primitive animals, that is there. And so, one of the evidence, or the characteristics of pidgin have been common. If you look at pidgins, the very fact that how, languages which are developed by in basic animals, how they are the reason for the development of the language, that we have.

In explanation to that, we will look at, what character resources, since pidgin is the most basic language, we have evidences that, most pidgins have a common characteristic. And, that basically points out the fact that, languages evolved, from a common point, either the Homo erectus or that kind of a thing. So basically, this this proves that, there was a proto-language. And, from there, the whole of language came in.

And so, one evidence for that, is that, um most pidgins have a common characteristic. So, pidgins are simplified languages, but they are very useful for communication, when no common languages are available. And so, most pidgins have a simple phonology. For example, them and there, dem, dere or businesses, pidgin. So, pidgin basically is believed to be, the Chinese word for business.

So, so one characteristic of pi pidgin is that, it has simple phonology. So, what was pidgin, first of all. It is as it is a simplified language, very useful for communication, when no common language is there. Also, they suggest that, an intermediate step between, animal communication systems, and full-fledged human language is evolutionally viable. So pidgin gives the reason

that, that there is a revolutionary step, or there is a step where, animal communication and human communication.

This is the link between, the animal communication and the human communication. Also, one generation, transits from pidgin to creole, ransom has support to discontinuity theory. Now, all pidgins are some common characteristics. First, they have the simple phonology, as we are looking at, them and there. And, if you look at it here, this is the phonology, which is which is out there. TH replaced by D, in this case. The TH, they are replaced by, D here.

Also, they generally lack a morphology. Most pidgins do not have a morphology. For example, single and plural, if you look into it, one man, two man, go today, go yesterday. Whatever you look in to it, there is no morphology, as such. And then, they have limited vocabularies. Most pidgins have limited vocabularies. Mostly, content words are there. You have the noun, verb, few functional words. For example, a, is, of, the, these are the basic words, that you will have.

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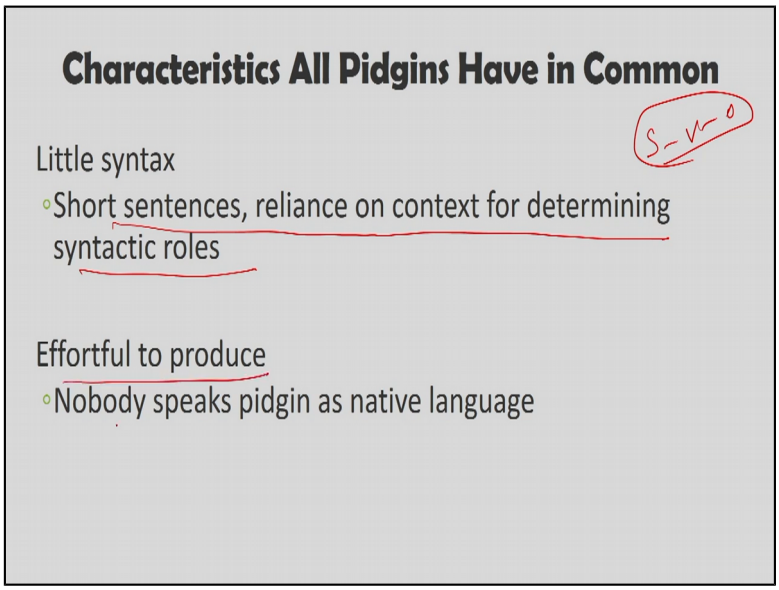

Then, most pidgins, they have little, or no syntax. Example, their short sentences, reliance on context for determining the, syntactic rules. So, the word order is free. So, going one man, or one man going, one man eating, that kind of a thing. So, word order is not fixed. As in English language, you have the, subject, verb, and object. This word order is not fid fixed in the pidgin. And also, effortful to produce. Nobody speaks pidgin, as a native language. And so, they require some effort to produce.

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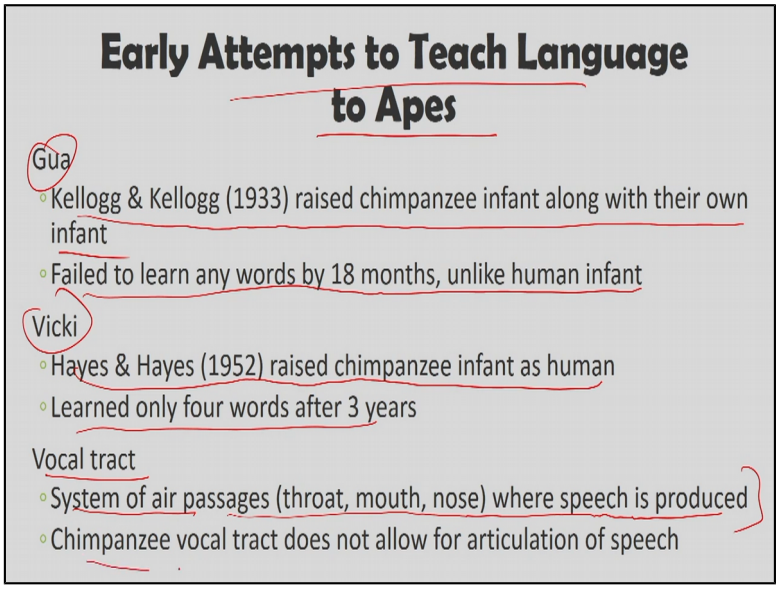

Now, so basically, pidgin is one evidence, that languages actually evolved from, the lower level animals. For example, guerrillas, chimpanzees, that kind of proto-humans. And, they developed a proto-language. And, that led to the development of complicated complex languages, that we have today. Now, early attempts to teach speech to primates, they failed because, they lack the vocal tract structure, that are required to produce full range of speech sound.

And so, early attempt to teach languages to the apes. Gua did that. And, Kellogg & Kellogg, 1933, raised chimpanzee infant, along with their own infant. And, they failed, to learn words by 18 months, unlike human infants. After 18 months, they failed to learn words. Also Vicky, Hayes & Hayes, 1952, raised chimpanzee infant as human. And, the learned only four words, after 3 years. Whereas, their own child, could produce, unlimited vocabulary, by 3 years.

Now, the reason for that is, vocal track system of air passages, throat, mouth and nose, where speech is produced. This is not present in chimpanzee. And, that is one reason, why they cannot produce the speech sound, which is there. And also, chimpanzee's vocal track, does not allow for articulation of speech.

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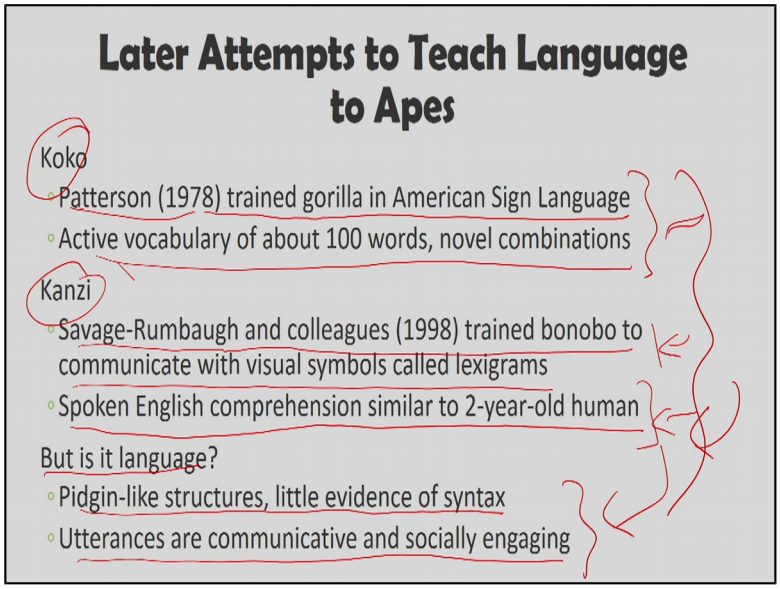

And, that is why, the reason why, early chimpanzees, or early studies on chimpanzees, were not successful. Later, attempts were done, to teach chimpanzees, particular languages. And so, Koko was one. Patterson, 1978, trained gorillas in American sign languages. And so, active vocabulary of about, 1000 words, and novel combinations. But, that is the best, they could do. Similarly, Kanzi was a chimpanzee. So, Savage-Rumbaugh and Colleagues, 1998, they trained bonobo, to communicate with visual systems called, lexigrams.

And so, they learned, Kanzi learned, a lot of languages, or a lot of words, and word meanings, but they could never produce the sentence, or the kind of complexity that language requires. Also, spoken English comprehension, similar to 2-year-old, could be generated, was able du these Savage-Rumbaugh was able to generate with the Kanzi, but, that is the best, they could do.

What is, but is it language? The pidgin-like structures, are little evidence of a syntax. And, utterances are communicative and socially engaging. So, the kind of thing, that these people were doing, by teaching animals. The basic question is, what that language. Why because, they had little syntax. And, they could produce, certain words. They can utter, certain words the words utterance was very limited. And, so they had, no meaning, as such. Utterances are communicative, and socially engaging

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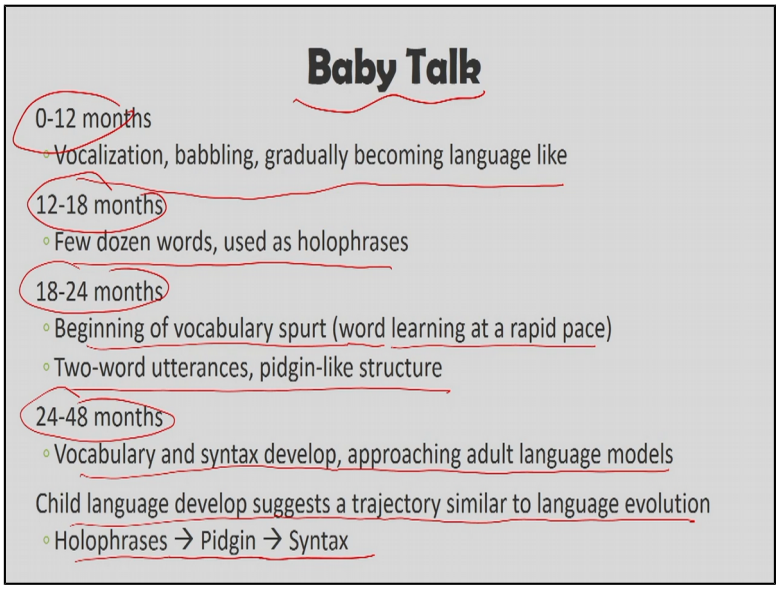

So, let us look at, how babies talk? And, let us look at, how evolution of language happens in in humans? So, 0 to 12 months, the vocalisation, babbling, gradually becoming language like. By, 12 to 18 months, most babies could produce, few dozen words, which are generally, holophrases, so complete phrases. By, 18 to 24 months, they begin of wok vocabulary spurt, word learning at a rapid pace. And two word utterances, pidgin -like structure, happens by 18 to 24 months.

And, by 24 to 48 months, vocabulary and syntax develop, approaching an adult language models. Children like children language develop, suggests a trajectory similar to language evolution which is holophrases, leading to pidgin, leading to syntax. So basically, how it is proposed, that language develop is, first children, they learn holophrases. And then, they learn the basic sentences. So, mother drink, or baby drink, or mother smile, that kind of a pidgin. And then, there is a syntax. So, mother will drink, I will drink water, that kind of a syntax followed, language is followed.

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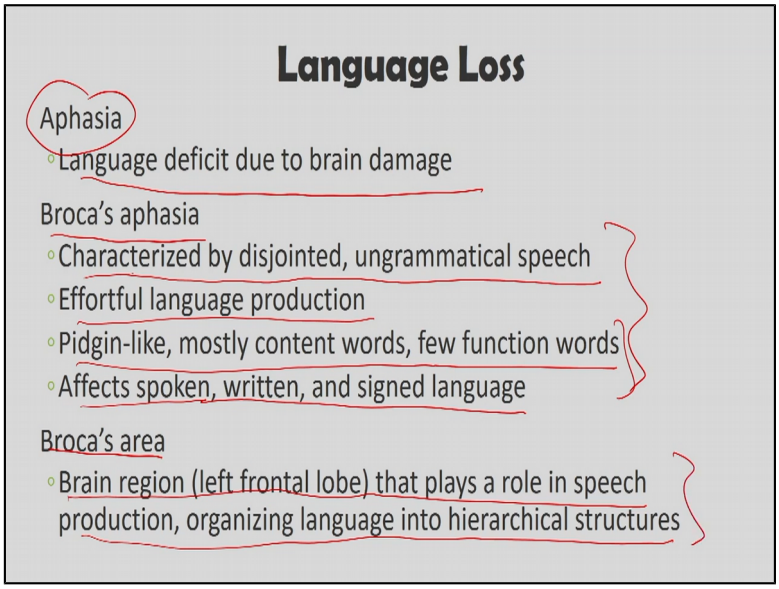

Now, language loss. Obviously, we have looked at, how language develops. But then, there are other problems also, or there are other means, or states, or the loss of language. Let us look at, how loss of languages are there? What are the kind of losses of language? And, what they are signifying? So, we have aphasia, which is language deficit, due to the brain damage. So, if you have a deficit in the brain, in particularly in the Broca or the Wernicke area, that leads to aphasia, which is the deficit of a language.

Now, you have two kinds of aphasia. You have the, broca's aphasia, and the Wernicke's aphasia. So, let us look at, Broca area. Broca area is language area, and also Wernicke's area is a language area. So, what is broca's aphasia? Characterised by disjointed, ungrammatical speech. So, people will be able to speak, but they will be able to speak, disjointed sentences, which has no grammar as such. So, fine language speaking, but then, it has no grammatical structure.

Effortful language production. You will not be able to produce, you will be able to produce language, with greater efforts. Pidgin –like, mostly content words, few functional words. Affects spoken, written, and signed language. So, these are the basic things. So, you will be able to produce, pidgin like, mostly content words, few functional words, out of it. And, it will affect, spoken, written, and sign languages.

So, broca's area. The brain regions, left frontal lobe, that plays a role in speech production, organising language in to hierarchical structure. This is where, the Broca are is. And, this is what leads to, the broca's aphasia. And, this is where, the broca's aphasia is there. Also, there is

something called, Wernicke's aphasia. And, Wernicke's aphasia, what you tend to do is that, you are able to produce language, in fluent ways, but then, it has no meaning.

So, when the meaning of a language is the language, that somebody is producing, is devoid of meaning, it is Wernicke's aphasia. But, if you are not able to produce language itself, it is basically broca's aphasia. And so, that brings us, to the conclusion of this particular session, that we have had. And so, we will do a little recap of, what we did in this particular session. So, we started off, by looking at, how human languages progress.

And, what is the pyramid structure of human language. How basic structures, they combine together with each other, to form the basic sentence. From there on, we moved on to looking at, the idea of, how sentences and discourse are there. And, what is discourse? And, what is sentence. And, what is the phrase structure rule centres. We looked at, the properties of discourse. And, we looked at, how displacement really works for humans, and it does not work for animal communication system.

Then, we looked at, evolution of language. How language evolved, over the period of years. And then, we looked at the idea of recursion, which is the modern view of, how human language has evolved. We looked at, Chomsky's idea of centrality of syntax, and other ideas, which basically produced the fact that, language is continuous.

We also looked at discontinuity theories, which basically says that, language evolved out of, one particular language was not, evolution of language was not in in a sequence, from protolanguage, to pidgins, to complex languages. Discontinuity theory believes that, language has evolved out of one spurt. And so, we looked at the foxp2 gene, the disparity between animal communication, animal language and these evidences, which pop proposes the idea of discontinuity theory.

We also looked at, evidences of continuity theory, which are how the natural selection in language production, central utility syntax such as that, language is more or less developed in a gradual sense. The existence of pidgin suggests that, language is a more or less developed from proto languages. And so, this gives an idea that, it is continuous in language. Also, social learning theories, provide a good support, to the continuity of languages.

Then, we saw, how the pidgins, the existence of pidgins, and casserole creole, these led to the fact that, languages, how they developed, from the earlier humans that we have. We looked at how, pidgins their characteristic in between all pidgins. And, how pidgins the basic structure, or the midway between the protolanguage, the holophrases, and the development of the actual language.

We looked at, attempts to teaching how, chimpanzees, how they worked, and they support the fact that, language was a gradual development. And, how it actually developed from the basic chimpanzees in in our ancestors, and how they came to us. And so, and lastly we saw, how aphasia or how when you have certain brain damage, how they can affect the language loss, or what kind of language losses are there.

So, in all, in these two sessions, what we have done is, we looked at, how language has developed, what is our animal communication system, what is a human communication system, or human languages, how they are different, how they have evolved. And, what are the basic evidences, that they have evolved, either in the one spurt, or they have evolved over a gradual period of time. And, we have taken evidences from, around the world.

We were try to look at, how does the land how has language evolved, or what is the way in which, language is ah, what is the way in which, we should be looking at, the progression of language. Now, in the upcoming lecture that we have, the second the third lecture, we look at the signs of study language. We will focus on, those methods through which, language is studied. And, we will look into several other aspects of our language, and the methodologies, the tools, that I use for study language. So, until we do that, from here, it is good bye, thank you.