

Principles and Parameters in Natural Language
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Lecture - 19
Phrase Structure

We want to look at phrase structure today. Soon after discussing components of a sentence at two levels, first we looked at lexical level, where we have seen words, and then we looked at grammatical relations such as subject, objects and verbs.

And then we looked at the abstract part of sentences; such as the components that are responsible for agreement namely certain lexical features like number, person and gender, and then more functional features such as tenses and agreements and so on right. Then we looked at nature of verb, in terms of its transitive nature and intransitive nature and the transitive nature and we have seen that, the number of objects in a sentence depends on verb. So, these are things that we have seen, and then finally, when we were looking at some sentences yesterday, we try to look at the fact that some words seemed to be grouping together.


In other words, besides grammatical relations in a sentence like subjects and objects, we have more to look at in the sense that, each word in a sentence may belong to a particular category, but they do not have their independent status only, which is to say, they make a block, and we want to see what does that block or that formed constituent mean, what is its status, how does it work in a sentence.

Do they really form a, do they really form a block, do they really form a unit, and then if they do then how are they represented, and how do they interact with others, with other units that has other blocks, and components within that unit itself.

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Phrase structure

- Some words appear to belong together:
 - {The fat monkey} {was jumping {on the roof of this building}}
- Groups of words that belong together are **constituents**
- The part that determines the properties of the constituent is the **head**, and the constituent can be referred to as a **phrase**: e.g. **noun phrase**



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So, look at this sentence when we talked about this, the fat monkey were jumping on the roof of this building. We are saying the fat monkey, is forming a constituent right. What makes us think? So, that it is forming a constituent, if you just look at the chunk, what can you say, why do you, why would anyone say that this chunk. The three parts of this phrase making a group together and each one of the three parts are not in association with other units of this sentence. You with me, we understand the question.

Why do we say that the first, what is the first word in the sentence.

Student: The.

The right. Which category does it belong to?

Student: Article.

It is an article right, we call it article. Why do we say that this word is part of this group. not just, because they are together right. Is there something else going on here?

Student: The is help in articulating which among the fat monkeys we are talking about.

So, we can say the has something to do with monkey right. It to be a specific like you said, it is a specificity marker, and it tells us among many monkeys, which, or among many fat monkeys, which monkey are we talking about. So, that is the function of the,

but more important part for us to understand here, is this word is somehow related to monkey right. How about the second one fat?

Student: (Refer Time: 05:20).

It is an adjective. What is it doing in this sentence, what is it talking about. We know their objectives describes something, it gives us some add additional information. So, what is it giving additional information about?

Student: The monkey.

The monkey right. So, the simple answer to this question, that the words in a group are related, because rest of the words are talking about one particular chunk, one particular thing in the whole chunk right and. So, which one is the most important part of this chunk?

Student: Monkey.

Monkey right, because without rest. And the reason why we are saying it is important, because without rest of the two we can have monkey, but without monkey we cannot have rest of the two, rest of the two do not mean anything. Therefore, that is an important chunk. So, let us hang it here, and we come back to the structure of a phrase in a moment to see how it works. And similarly word jumping on the roof of this building is one large chunk, which is predicate and all, but when we look at on the roof of this building right, on the roof of this building; let us just look at this part of the chunk. We see that there are two parts.

On the roof right, and of this building. If I give you the whole chunk together, which one is the most important part of this whole chunk?

Student: (Refer Time: 07:17).

Anybody please look at the whole thing, on the roof of this building. This is what we are saying is one chunk right. Which one is the most important part, like monkey was the important part of the first group of words.

Student: Building (Refer Time: 07:37).

Building or roof.

Student: Roof.

If you are saying roof, you need to say why, if you are saying building you need to say why, go ahead.

Student: Because the monkey was jumping on the roof and (Refer Time: 07:57).

Sure, it was jumping on the roof, roof of what. Roof cannot be hanging thing right. In a way I am trying to answer your part. So, why is building important in this whole phrase, because on the roof right, in a way is talking about of this building all right. So, the relationship between, see these two these. There are two phrases in this bigger phrase right, and one is related to the other one.

So, now if you are looking at the first one on the roof, then roof is important, because the is describing, the is talking about roof, and on as a preposition, is also telling us something about the roof, if you look at another the last chunk of this building.

Same thing is happening. What is this, as a category anybody. This as a word which category does it belong to. No idea. Let me ask you this thing again. You have heard this word this before right, which category does it belong to. Forget about category, what does it do, what does it do in a sentence. No.

Student: (Refer Time: 09:52).

No it does not specify anything.

Student: It is a pronoun.

It is a.

Student: Pronoun.

Pronoun; what do pronounce do.

Student: Substitute for each time instead of line specifying what our subject does uses this (Refer Time: 10:07)

So, what it is substituting in here.

Student: instead of specifying what it building was (Refer Time: 10:11) by this I mean you (Refer Time: 10:13) specified into (Refer Time: 10:15).

what you saying is partly right, but not in this context, this, and you also right that its a pronoun, but among pronouns, and my expectation is not that you have a readymade answer to all these questions, my, the reason why I am asking you these questions, is because you pay attention to these little things. I mean I do not need to tell you, I do not even need to ask you, even sarcastically what does this mean right. So, all I am asking a is that you look at these little things, it is definitely a pronoun, but it is a specific type of pronoun, which is called demonstrated pronoun, which demonstrative pronoun, which talks about, and you are also right that pronouns usually replace nouns.

But in this case it is a demonstrative pronoun which is talking about, which helps us understand the directionality. We are talking about this building not that one, so, but the. So, the category why it is a pronoun, it is a demonstrative pronoun, it has a function all that is fine, but it is related to the word building right. Similarly so on the roof of this building you see, it is a large phrase of similar two phrases of similar status, but one is related with the other one right. So, words grouped together to make a phrase, and phrases related to one another. In one way or the other, they do not. In in other words phrases do not have their independent status. So, you will remember this thing.

This is an important and crucial juncture for you to understand a sentence, words grouped together to form a phrase, and then such phrases in a sentence are not independent of one another, they are related to one another in one way or the other. So, now before we move to the next slide, in the same sentence, if I say, if I tell you the; let us let us look at the whole phrase again, on the roof of this building right. We saw that on the roof, is related to another phrase of this building. Now we are talking about one whole chunk, on the roof of this building, what is this related to in this sentence? What is this related to in this building, the question clear. People this side understand the question. Yes, no.

Student: No.

No, you need to tell me, I can see that the question is not clear. You see I am talking about this whole phrase, because on the roof of this building, and just now I told you that phrases are not independent in sentences. So, if we have a, if this is a sentence; isn't it. In this sentence this phrase is related with which component of the sentence.

Student: (Refer Time: 13:54).

Sorry.

Student: The verb phrase.

The verb phrase right. The whole thing is part of verb phrase, but it is also related to the verb phrase, and to be really precise in the verb phrase its related to verb right, its related to verb. So, and what is this related with, the fat monkey.

Student: (Refer Time: 14:25).

Is also related to verb right, and what is the nature of this verb jump. This is a transitive or intransitive or transitive verb.

Student: Transitive.

Transitive or intransitive verb, transitive verb, how do you think it is a transitive verb.

Student: (Refer Time: 14:42) jumping (Refer Time: 14:44).

It is not the. We remember we cannot question jumping on what. We can only say jump, we can only question the verb jump, we can only question the verb jump with what, can we question the verb jump with what jump what, not jumping on what get it.

Student: Yes sir.


Stand, and stand up are two different verbs. I will go to those things later.

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Phrase

- A careful look at phrases reveals some patterns:

Det	N	
• the	student	= NP
Det	N	
• a	book	= NP
Det	N	
• some	papers	= NP
Det	N	
• two	pens	= NP



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So, after looking at every single word, every single part of the sentence, how every single part is related to rest of the part, is this making sense to you. Now let us look at some more phrases, and see how it works.

So, see when the, this is what we have been looking at so far. When we look at the two words the student, we know that this is forming some kind of a group right, because the words like the, a, some, to, these are all in a, when they proceed a noun in in language like English, when they proceed the nouns like student, book, papers, pens. They seem to be forming a group, and in that group the a, some, and to are called determiners. The same thing you just now somebody said articles, it is the means the same thing articles or determiner. Together when we have a determiner and a noun, together they form the phrase which is called a noun phrase. Why do we call it a noun phrase?

Student: (Refer Time: 16:42).

Should be simple, what is the. Remember when we were looking at the word the fat monkey, the phrase fat monkey; what is the most important part of this phrase.

Student: (Refer Time: 16:54).

Monkey.


Student: (Refer Time: 16:56).

Right. The word that is most important part we will head the whole phrase, because rest of the components are related around it, the has nothing to do with fat, fat has nothing to do with the, but both have something to do with monkey right. So, it's a, there its a head of a noun and therefore, it is a noun phrase. Similar things you see, all the words are nouns; therefore, with a determiners the phrase that come up is a noun phrase clear. I am going to show you the structure in a moment. Now look at this one. What is this..

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some more patterns:

V	Det	N	
• call	the	student	= VP
V	Det	N	
• buy	a	book	= VP
V	Det	N	
• bring	some	papers	= VP
V	Det	N	
• give	two	pens	= VP



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Now, we see, call the doctor. I am sorry call the student. You see the noun phrase is now in association with a verb right.

The focus changes. What is the important part of this?

Student: Verb.

This.

Student: Verb.


This phrase verb; therefore, it becomes a verb phrase. So, a verb phrase can have a noun phrase in it. Remember just now I was telling you, that phrases are not independent entities, phases in a sentence are related to another one, and this is how the whole combinatorial process in a sentence works. This is how we build a sentence. So, a noun

phrase is now part of a verb phrase, and the whole thing is called the verb phrase, buy a book, bring some papers, give two pens.

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and yet more patterns:

•	Prep	Det	N	= PP
	with	the	students	
•	Prep	Det	N	= PP
	from	a	book	
•	Prep	Det	N	= PP
	with	some	papers	
•	Prep	Det	N	= PP
	by	two	pens	



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Now, look at this one. You have just seen on the roof, you have just seen on the building, of this building. Now see again we have a, we still have those noun phrases that we started with.

Like the students, a book, some papers, two pens, but instead of verbs we have something else now, which is.

Student: (Refer Time: 19:30).

With from again with and by, these words are prepositions. We have we have talked about prepositions and postpositions, remember or not remember prepositions and postpositions. Prepositions are some functional words in a language like English which proceed nouns. If the similar type of element follows the noun, they are called postpositions right. In a language like Hindi, Tamil, Telugu, Kannada, Malayalam, the words like with from by, they will be following nouns; am I right. What is the word for from in Telugu.

How do we say from the book, from a book what, no one Telugu speaking here.

Student: (Refer Time: 20:30).

Loudly loudly.

Student: (Refer Time: 20:35).

So, how they say the whole phrase.

Student: (Refer Time: 20:37).

From a book.

Student: (Refer Time: 20:40) [FL].

[FL].

Student: [FL].

[FL].

Student: [FL].

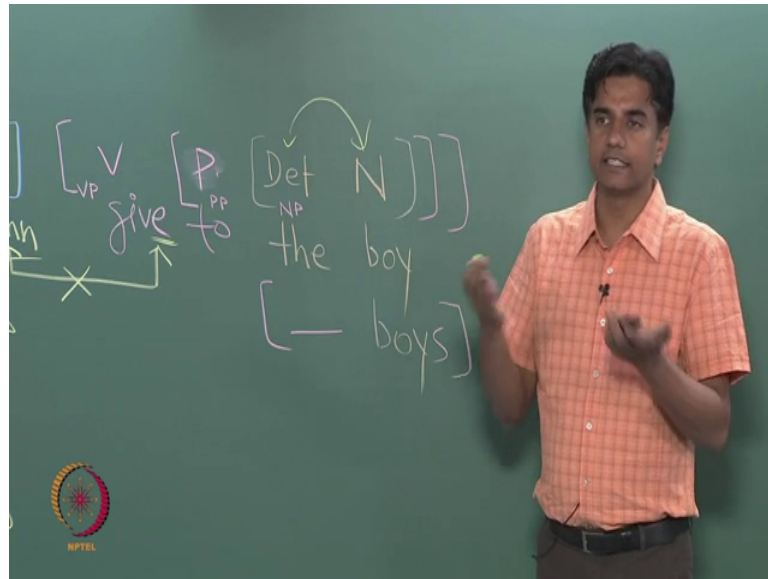
So do you see the that word is following the word [FL], it is never going to proceed the noun. Therefore, our languages are positional languages, does not change anything, its just the position of the functional element is different

So, now it becomes the fact that the whole NP is part of a part of a preposition. So, as long as we have, we are only talking about NP; that is noun phrase, the head of that NP is a noun right, but in a prepositional phrase, the head of the whole thing is a preposition. So, when we say, with the students in this phrase, what is important, what becomes important and what becomes head of the phrase, is a preposition. And then we will see what is the relationship between preposition, and rest of the phrase in a moment.

So, you have seen three phrases right; noun phrase, verb phrase, and prepositional phrase. Likewise we could have more of phrases depending on the category right. You also saw that, what is the important part of a phrase is, what is it that the whole thing, whole story is revolving around; such as the fat monkey, the monkey is important, because everything else is talking about monkey ok.

So, the way it works is the following. Now let me show you something on the board. So, we see, we have a noun right.

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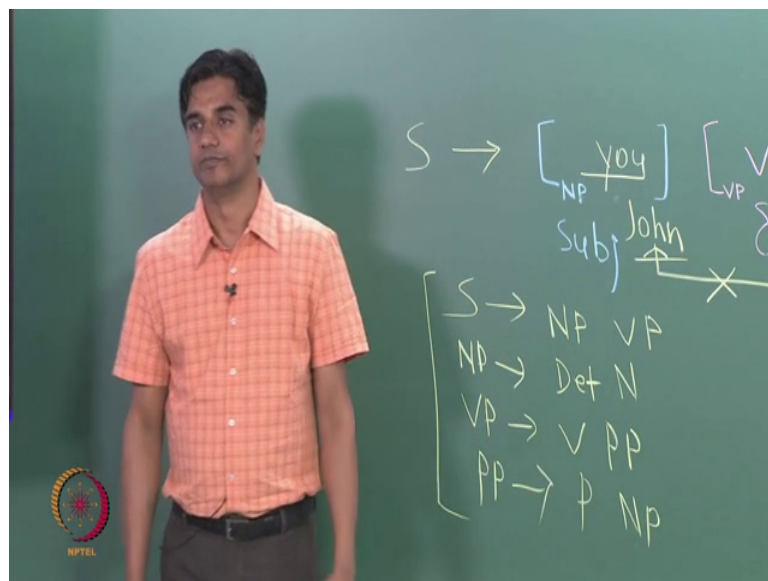
This is a, this is called a lexical item, a lexical category right. And then the moment it is, it comes with a determiner right, the two things make the phrase all right, which is to say, and the phrase is noun phrase, which is to say.

If noun heads the phrase, its ok that it has a determiner, but in a noun phrase could be formed even in the absence of a determiner; that is. So, if we have to say, the boy is a noun phrase, and if we do not have this, if you simply say boys right, with no determiner its a still a noun phrase, its a still a noun phrase. I am going to show you more of these stuff. So, what is the, let us look at, since we are talking about phrases, let us first talk about phase structure rules. Then you saw that we have a, we get a proposition here and then it becomes it propositional phrase.

So, we can say to the boy and it becomes a propositional phrase right. Now you put another, it gets a verb, and it becomes a verb phrase so far. So, here you have a noun phrase, here you have a prepositional phrase right, and now you have a verb phrase. So, how do I close this thing, should not be difficult so far. Now when we are talking about the verb phrase, it could have only a noun phrase, it could have more than a noun phrase; that is it may have more than one noun phrase, it could also have a prepositional phrase, or maybe two prepositional phrases right. On the roof of this building, it may have to prepositional phrases in it right, jumping on the roof of this building, the whole verb phrase has a verb phrase, and two prepositional phrases right.

Within the prepositional phrase, you see a preposition, prepositional phrase on this building, on the roof. The roof is a noun phrase, and on the roof becomes a prepositional phrase. We are talking about the same thing. So, far, but this is not a sentence yet. Why it is not a sentence so far. Can we say this is a sentence now? Even if we know some sentences like imperative ones, we can say give the book to the boy. Is this a sentence now? No, it still has something missing from here which is another NP, which is called subject, which is now this is a sentence.

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Are you with me, understand this. Without this thing it is not a sentence.

Now, we can pick where what kind of an NP comes here, but there has to be something here for this to get a sentence is status, and these are the things that, that we have been talking about without these, without this configuration. So, even when we do not say you, and we just say give the book. We mean that this is here. We have a different sentence, then something else happens so, far. Now let me draw your attention to something else, you may have seen that the noun phrase becomes part of a prepositional phrase; the whole prepositional phrase combines with the verb and becomes part of a verb phrase right, but there is anything what we refer to as agreement, that takes place only between these two right. So, if I say John give a book to the boy, is that a good sentence. John give a book to the boy, is that a good sentence.

Yes, John give a book to the boy, is this a good sentence. Some of you are saying yes.

Student: (Refer Time: 29:40).

Sorry.

Student: Punctuation (Refer Time: 29:43).

Right I mean. So, what basically, what you were saying is your punctuation is correct, we are saying John you give the book to the boy; that is not what I am asking. I am asking if I want to say John give a book to the boy, is that a good sentence; that is not. How will that become a good sentence?

Student: (Refer Time: 30:03).

We need to do something here right. So, what is it missing actually? The agreement is not correct; that is singular noun, singular subject. There is no singular marker here, or at this is does not reflect agreement properties taken care of. So, in the combinations of phrases, how phrases are combined with another phrase is one part.

Agreement is another part, which takes place between these two. I do not think I am talking about anything new, we have already discussed this thing; have not we, yes or no right. So, this is how we get a full sentence in; this thing that that you see sentence NP VP right.

So, we can see. Now we can simply say, a sentence is basically a noun phrase and a verb phrase, is that true. Can we say this thing? Then if I have to expand this, I can say a noun phrase is determinant.

Student: A noun.

And noun right a verb phrase is. If I have to give a description for this sentence a verb phrase is what.

Student: (Refer Time: 31:54).

Verb plus.

Student: Prepositional phrase.

Prepositional phrase right and a prepositional phrase is what.

Student: (Refer Time: 32:04).

Preposition and noun phrase correct. I do not need to specify this again, because it's already been specified. This is called what you have seen so far, is components of a phrase, and this is, if you put a sentence this way, this is called phrase structure rules, and it will vary depending upon a sentence right. For example, for this sentence or this structure that you see.

This rule takes care of everything. It will vary, but what is not going to vary, is the, is what makes a noun phrase, what makes a verb phrase, what makes a prepositional phrase. So, a prepositional phrase is always going to have a preposition and noun phrase, or it depends, it may have something else also, but looking at the prepositional phrase, you can give a phrase structural rule right; that is how I just wanted you to understand phrases and phrase structure rules. Is it, is there any difficulty here for anyone. No, this does not solve everything, in the sense that. I will talk about what it does not solve little later. These are these are rules, describing a sentence, describing a noun phrase, describing a verb phrase and a prepositional phrase.

But this does not tell give you structure. In other words, it does not tell us how different components of a sentence are hierarchically related in a sentence, everything do not, everything in a sentence does not have same status; that is on a flat line, we do see some hierarchical stuff here, but not every hierarchy is clear; that is not every kind of relationship between object and the verb, and subject and the verb is clear from this. So, for that we will talk about, we will look at the structure, and the reason why we are looking at the structure is, structure tells us the hierarchical relations. So, what I am saying is, look at this we have a determiner in a noun phrase and we have a noun.

If you are looking at the linear structure, linear representation, linear order, then it looks like there are two components that is all right. It does not tell you and we know, because determiners talk about the noun. So, noun heads the phrase, and it is more important than the determiner, because determiner alone may not make a noun phrase. These things, these the generic descriptions are ok, but these does not tell us the status of components within the phrase, or when they combine with another phrase what is the status of this thing, and then what becomes the status of this noun phrase within this prepositional phrase, and why does it need to combine with this, combined with that.

So, these things are not clear from phrase structure rules, are you with me. What phrase structure rules simply tells us is, it gives us a description, it looks more fancy right, what we are looking at. If you look at this, this sentence, sorry these rules right. These rules are mere description of this sentence that is what I am telling, do you follow this thing these rules, are mere description of these this sentence. What it does not do, is how is it, why is it that these two things need to combine, and once they combine, what becomes their status of a noun phrase, the whole noun phrase within this prepositional phrase, is not clear ok.

Student: Once you say its a prepositional phase (Refer Time: 36:55).

Of course once we.

Student: Once (Refer Time: 37:00).

So.

Student: (Refer Time: 37:01).

Absolutely right, there is an implicit hierarchy, preposition is more important, and noun phrase is not important, not that important, but then what is the relationship between the two. We can a still, what you are saying is, we can capture the significance of something of a noun phrase within a verb, within a prepositional phrase. We can capture the significance of a prepositional phrase within a verb phrase right, or a noun phrase within the verb phrase, but it does not tell us, what a. Let me put it this way right now, it does not tell us more with what other kinds of description, other kinds of explanation could tell you. And I am going to show you what are the things, what are other things that are more important to explain a sentence, that is what I am talking about.

Probably it is hard to talk about what it does not do, without describing what we get to do with other kinds of explanation. So, please keep these phrase structure rules in mind so that we can compare what was, what are the things that this does not do. Now before we dismiss this thing we have just seen that, and we are not going to dismiss in the sense that it has no meaning. No we are not saying that it has no meaning, it nicely describes a sentence, and what it also does, is it gives you the framework for generating lots of sentences. For example, this is the phrase structure for a sentence. So, all the sentences

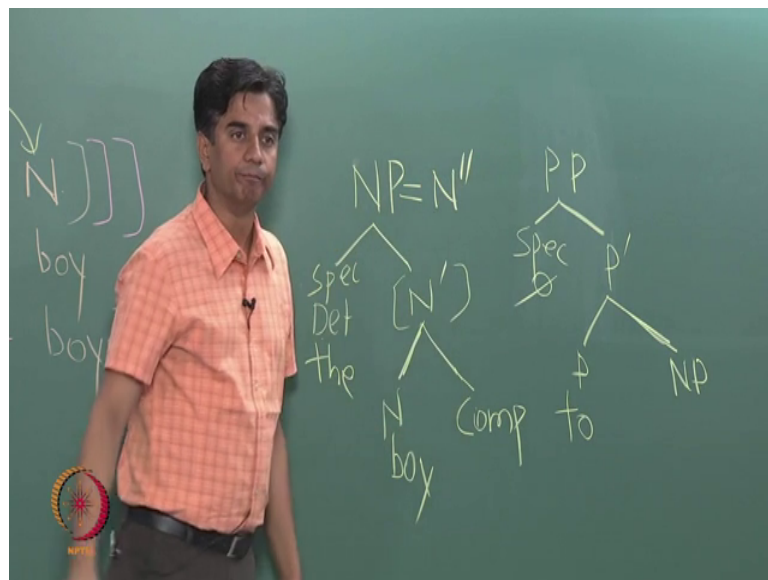
are going to have the same phrase structure. As far as we are concerned here, all the sentences are going to have this.

Then we, when all the noun phrases are going to have this, all the prepositional phrases are going to have this, and all the verb phrases are going to have this, whether all of them are needed in a sentence or not is not a restriction. A sentence may have simply a noun phrase and a verb phrase right, and it may end here with an with, just it may end here. A sentence may not have a prepositional phrase at all.

Now, the point is phrase structure rules help us generate lot of more and new sentences. Phrase structure rules were also part of, or our part of generative framework. So, once in the earlier days of this study, this was very prominent, when people had not figured out more. By now lot more things have been figured out, and we are going to talk about other stuff. So, see instead of representing these things in terms of rules.

Later on what happened was these things were represented in terms of structural configuration. So, look at this, how it works.

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So, the structure of a phrase is this way, and then we will stop. Each, for the structure, the branching is always going to be binary. The branching is always going to be binary. So, here is your determiner, and bear with me, because we want to keep the structure only binary. So, there was an intermediate category created, and then we have, let me put it

this way for a moment, are you with me, do you see this a structure. We are almost doing the same thing here.

We are almost trying to do the same thing, but we are putting this thing in terms of structural configuration. For that structure, the branching is only and always binary. So, we can say, we can see, we could have also said that look determiner and noun here end of the story right, but if we do that, then this, that is. Let us put it here. If we do this right, then there is no other way for expanding this phrase. No other way to expand this phrase. This becomes a closed phrase. What this kind of to. In order to expand this phrase an intermediate category was created, this is called N prime or N bar. It helps us branch further, and this becomes the head position in a phrase.

So, this position is called, where we get a specifier. Sorry where we get determiner, this position is called specifier position, in which we get determiner. This position is called head position, in which we get the main component of the phrase. And this position is called a complement position. So, the idea is, in retaining the head of the phrase, we need to have these two things. Give me couple of more minutes to show you why and how. Now look at the, also this is going to be the blueprint of structure of phrases. We talk about any phrase, whether we are talking about a prepositional phrase, we are talking about the verb phrase; we are talking about entire sentence.

This is going to be the structure of a phrase. In every phrase we are going to have a specify, and head and a complement. In every phrase we are going to have specifier head and a complement. Now if we want to look. Now we want to look at a prepositional phrase, a prepositional phrase. How do we represent a prepositional phrase in this structure?

Student: (Refer Time: 44:22).

Sorry.

Student: (Refer Time: 44:24) to the (Refer Time: 44:26).

Right, but, first, you are right, we will add here two, but we will that the addition in a moment. Just give me give it to me here. I have a. Is this clear that by binary branching

in this term, is not giving us expanding freedom. Therefore, an intermediate category so that we can branch further. Let me show you a prepositional phrase.

So, this is how a prepositional phrase works. Remember this is a blueprint of a phrase. So, we are going to have specifier, and here we are going to have what.

Student: (Refer Time: 45:17).

P prime right, and then P and this place is going to be for complement. So, what is the, in this phrase to the boy what is the preposition two. So, that comes here heading the phrase. In the boy, we have the and boy right. We had a determiner; that is a specifier. In the prepositional phrase, you do not have a specifier. So, this position stays empty. They have a head preposition, comes here, and then the in the complement position we have an NP which is.

Student: the.

The boy, the boy right. Now this NP position is going to be expanded again this way. There I think Pawan this is what you are talking about it will add. So, if you bring this NP position here, then you see the structure of a prepositional phrase. See this thing. Now this kind of addition or expansion will not be possible if we did not have this intermediate category. So, I am purposely emphasizing on this intermediate category. Since. So, the sole reason for this intermediate category to bring in hypothetically, a space for retaining binary branching, and creating a space for further addition right. I will talk about the nature and the relationship between head and the complement, and head and a specifier a day or so.

But right now I only want you to see, that the structural config, in a structural representation, the configuration is always binary. The branching is always binary; we retain it by introducing an intermediate category. We have a phrase and we have a category, you see this. We have a category preparation, and then we have a phrase prepositional phrase. This thing is not really needed, this does not mean anything, but we created this thing just to retain binary branching.

And then what is more important is the relationship between specifier and head, and head and complement. This gives you, this kind of hierarchy and relationship comes becomes

clearer, and the discussion becomes more relevant, when we look at these relations; final thing which we will and this is where we will start from tomorrow. The blueprint is always like this, phrase intermediate category and head, complement and. sorry specifier and the complement, and whether we are talking about a noun phrase or a prepositional phrase

Since its going to retain this way, a verb phrase will work exactly like this way. So, this whole phrase the, whole structural representation of phrase is called X bar theory, X bar theory. Since its a one prime. So, sometimes this thing is equated as 2 prime. So, when you put two primes it means NP. So, the idea is 0 1 2, whether we say NP or N double bar is the same thing

So, this this whole structural, this whole notion of a structural representation is called X bar theory, because in that X you can put any category and get the structure. More on this tomorrow, we have a class waiting. Please look at this thing; it is in the first chapter of the book. Now we are, we have moved, or you have moved from introduction, the whole thing is described in that book too.