

Language and Mind
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Module – 05
Lecture – 23
Sentence
Phrase Structure

We again look at Sentence today and in particular, we will be looking at Phrase Structure and here onwards we want to build our discussion on the underlying structure of a sentence. Remember, so far we have looked at components of sentences and the categories of those components. We have looked at components in terms of sentence, in terms of subjects and predicates. We have looked at the components of predicates in terms of verbs and its objects and we have also looked at the components within the predicate which are not objects.

And from there we started our discussions of two types of categories which are participating in construction of a sentence, such as lexical categories and functional categories, and such categories were subjects and objects and verbs; these are lexical categories, where nouns and verbs and prepositions are lexical categories and subjects and objects are grammatical relations.

Then, we looked at some categories which are functional in nature, which are underlying, not so visible, all the time; and those are the categories like tense, aspects, gender, number and person. These are participating in putting the two parts that are - subjects and predicates together - to make a sentence. At this is stage, we started identifying phrases that some elements come together and form a phrase. Little early, in the beginning of our discussions, we defined a phrase as the sequence of words, a group of words that are smaller than a sentence.

Remember, a phrase could be a phrase, and it could have only one element in it. In other words, even a single word could be a phrase; a group of words could also be a phrase. Little later, you will see that a sentence is also a phrase; but before we reach that point, we want to start looking at the structure of phrase and the development in terms of looking at the structure and the formation of these structures, and how these structures

are represented in human mind is what we need to look at in order to understand phrase structure.

(Refer Slide Time: 03:40)

Sentence

- [Students of physics eat pizza in the evening.]
 - Subject: Students of physics
 - Predicate: eat pizza in the evening
 - Verb: eat
 - Object: pizza

3

So, what is the structure of a phrase is actually we want to underline. We have looked at a sentence and I have just discussed with you these sentences. For example, students of physics eat pizza in the evening. Here, subject is - Students of physics; predicate is -eat pizza in the evening. Within the predicate, the verb is - eat and the object is - pizza. And then you have another element, another part of the predicate, that is - in the evening, which is not the object, not the verb, but is still part of the predicate.

And time and again I am underlining these things for us to understand two basic points: one, they are not like objects; they are not part of verbs. At the same time, they are part of the predicate and they are important. They need to be described and explained for us to understand sentence; we will be doing that shortly. Another point that I am trying to bring in here with this new sentence is for you to take a look at. So far you have seen a proper name as a subject of a sentence. And therefore, we have been saying a noun could be a subject, which is largely true; but now I am bringing in a sequence of words and we are saying that is the part of the subject; that is the subject.

So, the subject here is - students of physics – together. So please take a note of this thing. In the previous point, earlier when we made this point about the sentence...the sentence we had - John eats pizza with his friends in the evening, the subject was John; everything

else was predicate. Here, the sentence is - Students of physics eat pizza in the evening; and the whole thing - students of physics - is the subject, and this is a group of words. But, not just because it is a subject, but otherwise also, they, the three little parts like - students of physics - appear to be forming one unit. Likewise, eat pizza in the evening - is also forming one unit; and then when we start looking within, we see several elements are together to form units and that is what makes us curious to understand the grouping of these elements in terms of phrases and its construction.

It is significant for us to begin appreciating and understanding lexical and functional organization of these elements in terms of phrases and their structure to understand the larger structure of a sentence. So again we take another example to make the point. The fat monkey was jumping on the roof of this building.

(Refer Slide Time: 07:11)

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**

4

The fat monkey was jumping on the roof of this building; on the roof of this building – in all these phrases, elements together seem to be forming groups. So, you see groups of words that belong together are constituents of a phrase and we need to look at them in terms of their identity. Remember, little earlier we talked about their identity that the significant part of a phrase is its head and phrases are identified by their heads. So, we are going to be looking at their structure pretty soon.

(Refer Slide Time: 08:04)

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

5

So, look at this. The student - is a phrase; and the two components of this phrase like – the and student - are together; and thus they are called a noun phrase. It is called noun phrase because head of this phrase is a noun. And I am giving you several examples of nouns phrases for you to see. Like: the student, a book, some papers, two pens - all of them are noun phrases. In the center of all of them, we have nouns and then the other components of these phrases are determiners and you will see various examples of these determiners in this example.

Similarly, we want to look at some examples of verb phrases. Remember, we have looked at least four lexical categories: nouns, verbs, prepositions and adjectives.

(Refer Slide Time: 09:15)

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	

6

All the lexical categories, or for that matter functional categories, will be forming phrases. We want to look at the examples of lexical categories first, because they are easy for us to see; they are visible elements and we can substantiate that with examples pretty easily.

Now, look at the example of a verb phrase - call the student. So, the student was the noun phrase and now when the noun phrase... What is going on in a verb phrase? We see that the noun phrase is combining with a verb and therefore, we call it a verb phrase.

So, call the student - the structure is, verb and the noun phrase; and in the centre of this phrase is a verb; therefore, we call it a verb phrase. Buy a book – again, verb and the noun phrase; bring some papers – verb and a noun phrase; give two pens – again verb and a noun phrase. Therefore, they make a verb phrase. These are the examples of verb phrases.

Now, let us look at examples of prepositional phrases in English. With the students - we are using same noun phrase for us to see how the combination of these phrases work. So, in a prepositional phrase, we have a preposition and the noun phrase. So, with the students - we have, with as a preposition, which becomes the head of this phrase and then, we have a noun phrase which is - the students. This is the same in the next example; similar things from a book - together they become... from a book - together they become a PP which is a Prepositional Phrase.

But, the internal components of this whole phrase is a preposition and a noun phrase; and within the noun phrase we have a determiner and a book. Again, with some papers same thing; buy two pens. We see similar examples of the construction of a prepositional phrase. How does this work? How does the combination of these things work in terms of a sentence?

(Refer Slide Time: 11:57)

Phrase structure Rules

- Students of physics eat pizza in the evening.

- S = NP VP
- NP = N PP
- VP = V NP PP
- NP = N
- PP = P NP

- Recursion

8

So, we can say... again look at the sentence; we can say, broadly there are two parts of a sentence: sentence equals to an NP and a VP. So, if you take the example of the sentence on the screen - Students of physics eat pizza in the evening, what are the two components? Students of physics as one NP and eat pizza in the evening as second part which is a VP; then we want to describe the NP; what we mean by NP in this particular sentence. The N P which is the subject NP is noun NP.

So, a noun is – student, and then the PP is - of physics. You can see the description of a noun phrase as simply being noun; and then the description of a PP is P and NP. Then we have the P and N P, and here we can see the example of a preposition of an NP like - of and physics. If we want to look at this thing in some other terms, this is how they look.

(Refer Slide Time: 13:18)

Phrase Structure Rule

$$[S/IP/TP/AgrP [NP \text{ Students } [PP \text{ of physics}]]$$
$$[VP \text{ eat } [NP \text{ pizza}] [PP \text{ in } [NP \text{ the evening}]]]$$

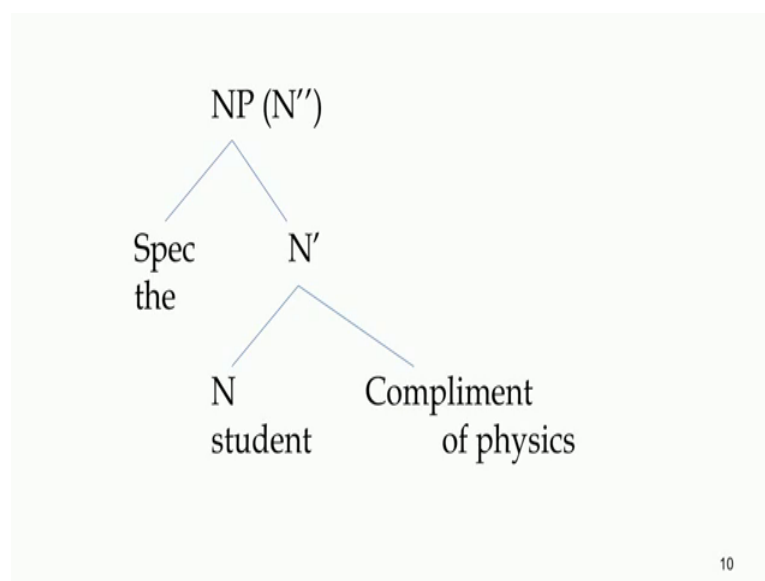
S = IP = TP = AgrP

9

Students of physics eat pizza in the evening - the whole thing is an S. Then, students is a an NP by itself, of physics is a PP, eat pizza in the evening is a VP, where eat is V and pizza is an NP, and in the evening is an example of a PP, where in is a preposition and the evening is an example of NP. And if you see that NP carefully, you find – the – as a determiner, and – evening - as a noun. So, these are the essential components and this is how we describe or write a phrase structure rule for a sentence.

We also need to look at the representation of these things; and in the representational structure, we would like you to see and understand several parts of the phrase in a different way and the crucial thing is the hierarchical ordering of elements within a phrase. So structurally when we represent a noun phrase, you see the structure of a noun phrase on your screen.

(Refer Slide Time: 14:43)



We have an NP and it has three parts: three important parts of an NP are - a specifier, which is written here in short – spec. Please take a note of this thing; this is short form of specifier. Specifiers are the elements which describe nouns, like – the - which tells us more information about nouns. Then we see the branching; it branches in two parts: we have specifier and then we see N and you see a little bar on the top of N and then you see again branching it in two parts; then you see N and the compliment.

So, what is happening here is several things that you need to look at carefully and keep in mind. First of all, the structure helps us understand hierarchy of elements within a phrase. When we start looking at the structure, we see three layers. First we see two bar layer which is a phrasal layer; it is also called NP or N double bar. Then, at the second layer we see just single bar; it is called N bar. This layer is introduced for branching the node further. And then we see the third layer, where we have the terminal node and this is where the lexical category comes.

So, you see NP N bar and N - these are the three layers that are significant, where we find lexical examples of two layers, like the terminal node which is a lexical layer and we find a lexical example of it, like a simple category of noun; in this example - student. At the maximal level which is N double bar or NP, we still find examples of lexical elements, like the whole thing - the student of physics, is an NP. The only thing which we do not find a lexical example of is the intermediate node which is N bar and here...

So, I am giving you examples of three parts NP or N double bar, N bar and N; but we do not have a lexical example of N bar and this intermediate category N bar is created to maintain binary nature of this branching, binary nature of this structure; and we see NP branching in two parts specifier and N bar and then N bar branching into N and the complement of this N.

So, having described it this much, I want you to pay attention to what I meant by hierarchical representation of elements in the phrase. The head of the phrase is the lexical category. So if it is an NP, the head of this is a noun and that happens to be student. Then there are two other parts of this head - that is head noun: one is a specifier, the other is complement. The specifier of this noun student is the determiner – the, and complement is a PP which is - of physics. So, there is a hierarchical relationship between complement and a specifier vis a vis the terminal category N. This is a fundamental structure of a phrase.

If we replace N with X, lot of times we replace N with X and we create a template, where we call it X P or X double bar, X bar and X. X represents a variable and we call it X P because we want to say that this is the template of a phrase, this is the fundamental structure of a phrase; and therefore, I want you to spend little bit more time on this, understanding this. Please pause and try to see the things that I have just described vis a vis the structure of NP.

So, why do we call it an X P? Because X can replace any other category. In this case, if we replace X with N, then it becomes an NP; if we replace X with a V, it becomes a VP; replacing X with a P, it becomes a PP; replacing X with an A makes it an adjectival phrase AP. Now, that is not difficult for you to understand. It simply means X...we are talking about XP, X bar and then X; because of this, this whole exercise is also called X bar and it simply means X, where X is a variable.

I have talked about the three layers, significance of three layers, binary branching, hierarchy of elements within the phrase and the terminal node; all these things create a template of a phrase and this is going to be working for every single phrase in our understanding of a phrase. Next time, we will be talking more about more examples of phrases, namely verb phrase, prepositional phrase...

And finally, while understanding the structure of phrase, we will come to the sentence and see how sentence is also an example of phrase and we will be looking more at the relationship of elements of the phrase. So, for example, here you see the relationship between a specifier and the complement being hierarchical with respect to the terminal node noun. When we will look at examples of a VP, we will see the relationship between the terminal node v and its complements.

We will see how verb phrase takes elements which are not its complement. We will be looking at these things. And finally, we will be trying to underline and look at how these things are represented in human mind. In fact, these are the representation of elements and categories in human mind and the combinatorial descriptions of these things are underlying patterns which help us create sentences, with the help of our generative capacity. More next time.

Thank you.