

# **Fundamentals of language Acquisition**

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**Lecture 029**

Lec 29: Primitives of syntactic knowledge

Hello and welcome back. We will start with Lecture 4 today. This is Module 6. So far, this is the module where we are discussing the acquisition of syntax by infants and small children, focusing on the initial stages of syntax acquisition. Till now, we have looked at the various theoretical positions regarding what each of the theories predicts, what the possible outcomes of those theories are, and how some of the data fit into the theories, such as the nativist theory and the constructivist theory. We discussed at the beginning that behaviorism does not quite hold here.

So, we discussed at length nativism and constructivism mostly, and then we also looked at some of the constraints on their productivity or some of the rules, as well as some of the hypotheses as to how the system probably works. So, now let us move on to some of the structures. One thing we need to keep in mind in this part is that we will be talking about only the basic structures because we are looking at child language acquisition. We will not take into account many of the complex constructions primarily due to the paucity of time.

So the idea here is to give you a basic understanding of how they go from one word to two, to slightly more complex structures; that is what we will focus on. So far, so good. So what is there now, what is ahead, and what lies ahead? In terms of syntax, we will try to see what they are expected to learn, what it is, what we exactly mean when we say that children are learning the syntax of a language, or whatever their output is—whether it is comprehension or production, depending on what we are looking at—what it is that the

children already know, what they are learning, and what the trajectory is. So, we will be discussing some foundational aspects of syntax in this regard. This can be called the primitives of syntactic knowledge, as it refers to the fundamental ideas and basic primitives on the basis of which later syntactic structures and complex constructions will be built.

So, these are some of the primitives we just mentioned; these are the formations, the basic building blocks of the syntactic structure of a language that the child needs to learn in the very beginning, and they need to express or show that they already know is part of their universal grammar or whatever. So, these are those components. So, constituent structure, then the concept of order, and then the concept of operations. So, as far as universal grammar is concerned, operations are very important where we talk about movements. So, movements leading to the displacement of elements, then coordination, adjunction, and embedding lead to recursion.

So, these are some of the primary structures. And then we also have some computations in terms of anaphora. So, within anaphora, we talk about pronouns, empty categories, or ellipses, and then morphosyntactic inflections and agreement between units sometimes distant from each other in a sentence. So, these are the primary building blocks; mostly, these fall into the categories that are discussed more in the UG paradigm. But these are the basic building blocks when we talk about syntactic units.

So, let us start with the syntactic units. We looked at the constituents. So, let us see what it is. So, children need to understand the units of syntactic structure, such as clauses or phrases. So, from word level, we are now going to sentence level.

So, we are now talking at the word level. So, the next immediate landing will be at the phrase level, phrase level, or clause level. So, these units combine to form a sentence. So, "there are the book" is a phrase; "red rose" is a phrase like that. So, when we put them together in some sort of rule-governed way, that is when we get sentences.

So this is why clauses or phrases will be our units. So, these units are called constituent structures. So a constituent, what is a constituent then? A constituent is a sequence of one or more items that functions as a single unit in a sentence. As I just said, the red rose, the red book, or a blue pen; let us say these are some small, very small phrases. So, this has the red book; the red book has an adjective and a noun.

So, similarly, you can have the book. So, it is a determiner and a noun like that. So, these are the constituents. This is one of the smallest sequences of one or more items. These can be considered as units in a sentence, a single unit in a sentence.

So, the constituents are organized in a hierarchical manner. So, this is what we mean by a hierarchical manner. Children need to understand this; this is called the skeleton structure of the sentence. So, in a sentence, the clauses are organized in a particular way, in a hierarchical fashion, as it is called. So, in the case of a hierarchical structure, this is how it goes.

So you have seen the sentences or the part of the sentence or the clause is saw the man with glasses. So I saw the man, and then you go like this. So you have at the top this VP, which stands for verb phrase. So at the top, you have the verb phrase, and then you go on to create a tree structure. So, this is how it is hierarchically organized in terms of how the sentence ultimately builds up.

So, you have "the man with glasses," which is the noun phrase here; the man with glasses is divided into D, and D comes here. D is the determiner, and subsequently, this goes on. This is how you break it down. And in fact, if you have understood this basic skeletal structure of a sentence, or let us say when children figure this out, that is when they are also able to disambiguate ambiguous sentences. So, one of the important takeaways from understanding this syntactic structure is disambiguating sentences.

Sometimes sentences can be ambiguous; it is this very simple sentence, like "saw the man with glasses," that can also be an ambiguous sentence. So, in the first case, if you go by this kind of tree structure, then somebody saw. So, let us say that Ram saw. The man with glasses, so Ram is part of an even superordinate structure, and then saw the man with glasses. This is one structure; on the other hand, the glasses were on the man whom Ram saw.

In the second clause of the second structure, however, you have this "saw" coming here, and this "with glasses" is part of this structure; it is not part of the, it is not inside this, but rather it is part of the main clause where you have the main verb "saw." So, here the glasses were worn by the man who saw whoever saw. So, this is what the hierarchical structure is all about. So, the syntactic units, the constituents, the units of the sentences are organized in such a way that they help you understand how each of those components is connected to the other components. So, what are the arguments of the verb, and so on? So, this is one of the skeletal structures of a sentence.

So, what is the role of understanding the skeletal structure? This sometimes helps parse

the sentence, as in breaking it down to its smaller parts. So, who had the glass, who saw whom, and all that, and also it helps you disambiguate certain kinds of cases. So, this brings in another important part of parsing, which is the categories. So, in the sentence, there are different categories of words. So, the main categories are functional categories and content categories.

So, we have our functional category, and we have our content category. Functional categories are important because they serve a grammatical role with little or no semantic content. Sometimes it can have semantic content, sometimes it may not, but it has a grammatical role, and it is a closed class, meaning a small finite number of items are present. For example, complementizers, conjunctions, inflectional markers, and so on and so forth. So, these are functional categories.

These are again the basic types of categories, types of words that you have, words or markers or grammatical markers that are part of a sentence. And then comes our content category, which is the main open class words. So, they generally convey meanings. So, the main words like nouns, verbs, and adjectives form our content categories. An infinitely expandable set of items exists because we call it infinitely expandable; nouns allow us to say that a particular language has a number of nouns equal to  $x$ .

Therefore, there is no limit to how many nouns that language may have. So, right now it might have  $x$ . But let us say that after 10 years it might have  $x$  plus 150 nouns. So that is possible. So that is why it is called an open class: because it is open to expansion.

However, the closed classes do not typically expand. So that is why. That is the difference. So, we have nouns, verbs, adjectives, and adverbs; these are our content categories. So, these are the two primary categories that play an important role in parsing.

So, when you parse, this is what you get. So, these are the content categories, these are the functional categories, and this is how the interaction between them happens. So, some of the most common phrases in terms of phrase structure grammar are nouns. These are how the P stands for phrase, and the first one stands for whatever type of phrase it is. So, noun phrase, verb phrase, prepositional phrase, and so on and so forth.

So, these are some examples. So, this is one adjectival phrase so gluey with the glue with the goo with their paddles fighting the battle, so fights the verb is like we just saw the man with binoculars, so the verb will come on this side and then the battle, so V and NP, so the superordinate category is VP, so the verb phrase. So, these are some of the most common phrases that we use in the case of phrase structure grammar. Now functional categories mark and head each of the basic constituents of a sentence because just now we saw, right,

so noun phrase. So, in the case of a noun phrase, we are talking about noun phrases and verb phrases; for example, this is the function head and function category head. So, we have "the," which is a determiner, and then we have "come.

" This is the example from the same poem that we talked about in the beginning, "Jabberwocky." So, this is how you break it down. So, functional categories mark and head each of the basic constituents of a sentence. These function as some sort of joint.

These are called functional heads. So, the functional heads provide a structure that holds content words like these. So, the jabberwock, even for a moment, just forget that this is not a real word, but we will treat it as some sort of content word. So, this is how it really works. This example has been given by Barbara Lust. Then comes the idea of order, order as in when words are added to the skeleton, children can mentally label phrases, and then you have a.

So, right in this case, we saw the order; this is about the word order in the English language. So, which way the head goes and how the branching happens depend on the word order of the language. So, that is also an important thing. So, based on the language the child is born into, their understanding of the ordering of those important functional and content categories will differ. So, nouns will head noun phrases, verbs will head verb phrases; these are the lexical heads.

So, depending on the languages, there are two types of heads: left and right. As I just said, English will be different compared to, let us say, Hindi or any other language. So, this example is again from Barbara Lust. So, this is a case of English, and this is an example from Sinhala. If I remember correctly, this is a Sinhala example, and this is, of course, English, so about mother, so about this, this is on the left side.

So this is what we mean by there being two kinds of ordering in languages: it can be either on the left side or on the right, so the head can come on the left or on the right. So, head here; this is the head on the left. On the other side, this is where the head is on the right side. So, this is a Sinhala example and this is an English example. So, these are the two kinds of ordering of the words, and depending on that, the tree structure will differ, and the head will appear either on the left or on the right.

So, children need to understand the basic skeleton of the syntactic structure of their language, which includes the functional categories, the content categories, and their

ordering in the hierarchy. So, this is the hierarchy starting at the top node and how it breaks down into smaller parts. Children need to generate, as a result, the underlying skeleton of each sentence and the system that operates on this skeleton. So this seems to be a given: the universal grammar generative perspective says that this is something you do not teach the child. Child automatically figures this out, and how do we know? We will see shortly that even the complex type of syntactic parsing they can do very early in life.

So, if they were dependent on learning as far as behaviorism is concerned, this would not be possible. Anyway, let us focus on what we are doing now. Children's first sentences generally respect the word order of the language. So, it can be SVO or SOV. So, subject, verb, object or subject, subject, object, verb.

VSO, there can be many different kinds of word orders. So, in the case of Indian languages, let us say "maine roti khayi," the structure is subject, object, and verb, but in English, it will be "I ate pizza." So, your subject, verb, and object. So, this is what we mean by basic word order. So, this is something that children do not seem to make mistakes with when they start speaking in their language.

It is not like, for the sake of argument, let us say. That children, in the beginning, in the initial stages, have just some sort of generic word order that they produce, and over a period of time, they master their own language or word order that is accepted in their own language, and then they learn; but that is not how it really happens. when they start speaking in sentences children generally get it right. Very interesting data come from German. That in German, the verb-final subordinate clause has a verb-final structure, whereas the main clause has a verb-second construction. So, in a main clause, the verb will come second, but in the subordinate clause, the verb will be final.

So, there is a difference between the main clause and the subordinate relative clause in terms of the position of the verb. Now, this might be confusing for somebody who is learning German, let us say at an adult age, but not for the child, because the data from children suggest that they do not get confused. Even though some researchers had pointed out that children may show an extended period of verb-final structure because they tend to stick to one. But later studies showed that German children, early on, can exhibit the exact structure that their language expects them to use. So in the case of subordinate clauses, they use verb-final construction, but in the case of main clauses, they do not.

So that confusion actually does not arise in the case of the German children. Now syntactic units need to be mapped onto this structure. Words are then mapped onto these units. So, the syntactic units, the categories, and then the syntactic units. So, what are the syntactic units? The verb, the noun, and then you map onto the phrase structure.

So, what phrase, noun phrase, within the noun phrase where it will go, what is the position? So, this structure and order may be transformed when forming wh-sentences, for example, wh-questions. So, not only do children figure out the words and their syntactic category and their position in the hierarchical structure within a sentence, they also seem to figure out that this structure undergoes certain changes, some transformations, and some inversions of certain structures while they are, let us say, creating a wh-question or creating a passive formation, for example. So that is what they will do after that. So after the two-word stage, this is when they actually start acquiring syntactic structure. Hence, it is important to distinguish between the age of emergence of a particular structure and the age of acquisition.

Some researchers make a distinction. When they have started to understand and create versus when they are already competent in using those structures. So, some sort of difference is always made. So, based on these children, some might start to show the emergence of certain structures, let us say passives, pretty early. But for them to be able to masterfully use it, they might need a lot longer duration. On the other hand, some children might not show the emergence of passives until, let us say, 2 and a half years, 3 years, or 4 years, but when they do, they do not take much time to master it.

So, this is where some differences in interpersonal change might be visible, and hence it has been taken into account while studying syntactic acquisition among children. The order of acquisition of various structures is also very important, so what comes first, what do children learn first, which of the structures they learn first, and is there an order; if so, is there some sort of universal rule? So, it seems there is very little variation between children in the case of most structures. So, once children start stringing more than two words together, they develop their grammar on many fronts simultaneously. So, what it means is that, on the one hand, there is a difference between emergence and final acquisition; on the other hand, there is a sequence. However, while we are talking about sequence, it does not mean that you know you can stop at one particular aspect, and then once that is mastered, you start learning another; that is not how it goes.

How it goes is that children start to develop many of the grammatical categories at the same time. But they might master one before the other; that is what this basically means. So, while the auxiliaries might still not be fully in place, they might start using embedded clauses. So many things are happening at the same time; remember we talked about word formation? There is an outburst of vocabulary acquisition at certain points.

Similarly, there is a tendency to learn multiple things. So, they are still figuring out their

auxiliaries, but they might start using their embedded clauses. So, things go simultaneously, but they may not master them at the same time; that is the idea. So, this is the well-known sequence of morphemes that children are supposed to learn; this is from the CHILDES database, and the original data came from Roger Brown's seminal work. So, this is how it apparently goes: his data from Adam and Eve and there was a third child. So, they are progressive verb endings followed by prepositions, then plural noun endings, irregular past tense verbs, possessive articles, regular past tense verbs, and so on and so forth.

So, this seems to be the order. However, this data was from English, so you need to keep that in mind. But this is how it has been studied way back; Roger Brown's study comes from the late 1970s. Some common clauses that the children learn in the English language at this stage. So, these are some of the clauses that are very common and have been attested to by many researchers.

So, you have S plus V: daddy is laughing. So subject and verb, then subject verb plus DO; that he broke. DO stands for this; it is the abbreviation for direct object. IO is for indirect object. So IO and DO, SVO, SV, and then O, like this: SVO and PP, I put it on the floor like this. So some of these structures are pretty common among English-learning children, and typically they appear in most cases.

Then, in terms of noun phrases, children are able to produce noun phrases with pre-modification of the noun at about 2 years. What it means is that they will have an adjective preceding the noun. So, the modifier comes before the noun. So, they have mastered this for around 2 years already.

So, big house, more biscuits, this/that, my book. Around two and a half years, multiple pre-modifications appear like that red ball. So, starting with a simple structure and then gradually moving to something slightly more complex. A little later, around 3 years post-modification appears with prepositional phrases.

So, the picture of Lego town. So, which picture is it? Picture of a Lego town. So, this happens a little later. So, starting with pre-modification with one modifier, and then two, and so on. Then pronouns appear around 2 years; the first pronouns are I, me, and you, it; it is often the case that they appear in the objective form first. So, like me, even when the subject is in subject position, 'me want toy', this is very common among English-speaking

children, and then other pronouns appear a little later. Then we have verbs and their forms; if you recall, we talked about how learning verbs is slightly more difficult compared to learning nouns.

So, the verb and its different forms start to appear in stages. So, auxiliaries appear a little later than main verbs. So, around 2 years, the modal auxiliaries can and will emerge. These auxiliaries appear first in questions and negative sentences; at around 2.3 years, the use of past tense inflection first appears. However, rule formation is evident even if they are able to speak or utter those constructions; they may not have the idea that they have already figured out the rule formation, which is evident a little later, around 2.

6 years. By children's overgeneralization of /-ed/, for example, "I brokeed it" and "I felled down," that is when you realize that the rule formation is already in place. So, they are using the same rule for many things; overgeneralization is one of the important features of speech around this age. So, this is what you see in this kind of structure. So, that is when you know the rule formation is already established. And then, of course, tense-marking children tend to use tense marking inconsistently in the beginning; for some more years, initially it takes them some time, though they might get it, but for consistency to appear, it takes a little bit more time.

English-speaking children express the progressive aspect only via the -ing inflection in the beginning, such as "me going." Not like 'I am going', but initially it might appear in this kind of format. Eventually, when auxiliaries start getting added, they get the whole form. Other aspect markers, like the perfective, appear a little later. One of the reasons proposed by many scholars for why the present continuous tense begins so early is that children's initial speech is about here and now.

Whatever is happening right in front of them, whatever they are doing, whatever their caregivers are doing, this is what their conversation typically revolves around. So, that is probably why they learn the -ing inflection pretty fast as opposed to any other kind of tense marking. This is one of the hypotheses. So, these are the basic structures. So, starting with functional categories, content categories, nouns, verbs, you know, pronouns, and all of these.

So, all of these are typically in place by 2.5 years. Some children, of course, might go to 3 years. So, this is where we complete this particular segment. In the next segment, we will talk about more complex structures and how they are formed. Thank you.