

[SQUEAKING]

[RUSTLING]

[CLICKING]

NORVIN
RICHARDS:

So last time, we started doing syntax, and we had started drawing trees like this one. What I said, I think, was-- if you remember when we were looking-- when we were doing morphology and we were looking at words like "unlockable," we were convincing ourselves that it was profitable to think of words like that as not just consisting of three morphemes-- "UN-LOCK-ABLE."

It does consist of three morphemes, but that it's useful to think of these three morphemes as being composed in pairs. So there are two ways to make the word "unlockable." You can put "un-" together with "lock," and then you can plop the result of that together with "-able," or you can put "lock" together with "-able," and put the result of that together with "un-" and those mean different things. That was what we were saying when we were talking about "unlockable."

We're going to talk about syntax the same way. Yes, this is a string of words-- however many words it is-- 8, I guess-- but there's more to say. It isn't just a string of eight words.

It's a string of 8 words that are composed via this pairwise operation of merge that takes pairs of things and puts them together to form larger things. The other thing we said-- so I've just gotten started on building a syntactic structure for this sentence here by saying, yeah, we've got these two nouns, "book" and "garage," which are preceded by determiner "the," which should be merged together with these nouns to form larger objects.

In the case of "unlockable," we were saying affixes like "un-" are going to come with instructions like "Put me together with a verb and I'll give you a verb." And instructions-- sorry, morphemes like "-able" are going to come together with instructions that say "Put me together with a verb and I will give you an adjective." And so when we put two things together, we're adding these-- putting labels on these nodes that we create via merge.

In the case of morphology, what label you put on the larger node is determined by the affixes. And we decided affixes have to come with instructions, like "I turn verbs into adjectives," or "I attach to adjectives, and the result is an adjective"-- things like that. For syntax, similarly, we're going to take these pairs of things and we're going to merge them together, and we're going to give a label to the result.

In syntax, the label of the result is always going to be the label one of the two things that you put together. So in this case here where I merged "the" and "book" or I merged "the" and "garage," I'm going to give the result of that the label "N," because we decided that the rules-- whatever they are-- for determining which things can go where seem to care about the N.

That is, there are a variety of things-- take a sentence like this one-- that can go in the slot occupied here by, for example, "the book." And what they have in common is that they have nouns in them. So you can say "I will find the book in the garage," you can say "I will find books in the garage," you can say "I will find purple books in the garage," you can say "I will find the purple books about syntax in the garage."

There are various kinds of modifiers and other things that you can add or not, but what they all have in common is that there's a noun. And so we're going to reflect that fact by naming that larger object-- the result of merging "the" with book-- giving it the label "N" as well, passing on the fact that there's a noun in here to that node.

In the case of morphology, like I said, we had nice clear rules for what label to put on each of these nodes. The rule was look at the affix and the affix will tell you what you should do. So the affixes say things like, if you merge me with a verb, the result will be a verb, or if you merge me with a noun, the result will be an adjective.

Syntacticians have not gotten that far with figuring out the rules for how to label things, so I am just going to label things. And this is a current topic of fairly hot debate, actually, among syntacticians-- like, why are we getting the labels that we are? We're pretty clear on what the label should be, but why is not as clear.

So that was one part of the-- start of building a tree for this sentence. Are there any questions about this? This is all quasi-review. So from here, we've created "the book" and "the garage."

We decided "in the garage" is also a constituent. It deserves a node. It's a prepositional phrase, so we're going to merge "in" together with the node that we created by-- that first instance of merge, "the garage"-- that N-- that larger N. Yeah, so we'll merge P with that larger N and we'll get a larger P-- a phrase with the label P-- what you could call a prepositional phrase.

And then we said similarly, "find"-- we're going to merge "find" together first with "the book," and then finally, merge those two things together to get this structure for that much of the sentence. And we'll stop here for now. We're going to build the rest of the sentence in just a second.

And I think this was as far as we got. And I said, is anybody alarmed or disturbed by this. And several of you raised your hands, because, in fact, this is only one of a couple of possible structures this tree can have that's-- sorry, this is only one of a couple of possible structures this sentence can have. We're going to spend a lot of time talking about that today. You were one of the people who raised your hand last time. Yeah?

AUDIENCE: So we have P for both N and raised in the variety [INAUDIBLE]. So is N by itself a prepositional phrase or is it just verb phrase?

NORVIN
RICHARDS: So good question. Let's see if I can answer your question in a way that will not cause more confusion than it gets rid of. I have used now the phrase "prepositional phrase" a couple of times, and "noun phrase," and "verb phrase," and I'm going to dramatically introduce what those mean in just a second.

I think it's almost the next slide. Let me just ask you to hang on to that question. It's a good question. But are there other questions about this much-- this far?

So if you're looking at this and thinking, wait, I think of it as having a different structure, that's a good thought to have. Hang on to that thought. Ah, good-- this is the answer to your-- I'm sorry, what's your name again?

AUDIENCE: Kirai.

NORVIN Say it again?

RICHARDS:

AUDIENCE: Kirai

NORVIN

Kirai. Kirai's question-- so he wanted to know, what do you mean when you say phrase? There's a convention,

RICHARDS:

and it's really just to make it easier to look at these trees. But it's a very widespread convention, and I'll be doing it all the time when I draw trees, so let me introduce you to it.

If you have a tree-- so the tree we had before-- let's go back a slide. The tree we had before-- whoa-- had various nodes that have the same label. There are three nodes here that have the label V, for example. And there are two nodes that have the label P, and there are four that have the label N, actually. One-- two associated with "garage" and two associated with "book."

And if you look at this tree, it can be fairly confusing looking at all of these nodes that have identical labels. So the convention-- one convention just for making it easier to look at trees is to mark the highest node that has a given label when you have a sequence of nodes that all have the same label, because they all started with one word and they're inheriting a label from that word.

When you get to the highest of those things, you give it the label P, where P stands for phrase. So the answer to this question-- when we say a prepositional phrase, what we typically mean is the largest thing with the label P from a given-- from a given node.

So "in" by itself is a preposition, and that larger thing with the label P is the prepositional phrase. Again, this is just to make it easier to process trees so we won't see so many identical labels. We're just putting a mark saying, this is as far as this label got. That's all that means. Yeah?

AUDIENCE:

[INAUDIBLE]

NORVIN

Ah. So in this tree, it's not because there is another thing with the label V that is higher than "find the book"-- yes.

RICHARDS:

But you are right-- there is another thing we do for exactly that case. Let me show you that.

Nice question-- it allows me to segue nicely into the next slide. We have another thing that we do for exactly that case. Nodes that are not-- that don't get the label P, because they're not the highest thing and that also are not-- just the bare word, like find-- just the verb-- things that are in between that.

It's an unfortunate label. We call things like-- so I'll draw it again here-- "find the book"-- so I won't draw the whole thing, but "find the book"-- there's this thing and then there's this.

This is the VP because it's the highest thing with the label V. This is the V because it's just the verb-- it's just a word by itself. And this thing, we use a prime symbol to mark it, and it is called a V bar.

I'm sorry, that's just the way we do things in syntax. I think it's called this because it used to be that people would write it like this with a bar over the top. This was in like the-- I don't know-- the 1960s, 1970s people began doing this. And I think people were literally using typewriters to go back and do an underscore over the top of the V or something like that. I think that's what they were doing with Stone Age word processing technology.

So the result of all that is that although nobody writes V bar, typically, you will sometimes see this in textbooks and things like that. It's not very common. What people much more commonly do is just write V prime, but it is never ever called V prime. It's always called V bar.

If you tell a syntactician, "Find me the V prime node," the syntactician will not know what you're talking about. Sorry. Yeah?

AUDIENCE: So if "find the book" itself will not, like, considered a verb phrase, I guess, would it have the bar or?

NORVIN If "find the book"-- in this tree?

RICHARDS:

AUDIENCE: Yeah.

NORVIN So it's a-- I'm sorry, can you ask your question again.

RICHARDS:

AUDIENCE: Yeah, because I'm just thinking from grammatical standpoint, I guess, if "find the book" would be considered a verb phrase. But since it's not the highest standard of the bar, but if it were not a verb phrase, would it still not apply?

NORVIN So if this sentence ended with "find the book"-- if it were "I will find the book," then "find the book" would be a verb phrase. A phrase is just the name for the highest thing with that label.

RICHARDS:

So just like in "the book"-- yeah, the book is a noun phrase. If you had something-- and "book" is not a noun phrase, it's just an N. So there are places where you don't get a bar just because you only have two things with that label. And you just get the N, and then there's the NP.

In this particular case, you're getting a bar because there are three things with the label V. And if there were more things-- if this verb phrase were more complicated, you could end up with a bunch of bars in between the verb and the VP. In general, you're going to get one P up at the top and one thing with no extra doohickey down at the bottom, so just V. And everything in between it will be bar.

Again, this is all just conventions. This is not meant to reflect anything deep. It's meant to make it possible for human beings to look at these trees and process the information in them. That's all it's for. Raquel?

AUDIENCE: For things like "will find" or like an auxiliary where you squish multiple verbs together, is there something more complicated going on there, or could we say that they're both part of a verb phrase?

NORVIN We have not gotten there, but you're right. And so Raquel wants to know what am I going to do with "I will"? And

RICHARDS: I will-- I will tell you what I'm going to do with that now.

We will give "will" its own label in just a second. Good question. Other questions about this? Reasonably clear?

So-- but yeah. So again, P is the marker for the highest thing with a given label. The lowest thing with a given label doesn't get a mark. Sometimes, when people want to make it clear that it's not a bar and it's not a P, they'll put a little raised 0 on it. I won't do that, but you'll see people do that sometimes.

So you've got the unmarked thing-- that's the word itself. You've got the P-- that's the highest thing, and everything else is a bar. One consequence of all this actually is that there are things which are both phrases and heads. This is connected to Kirai's question from a little while ago.

So the D "the" in this-- both of the instances of D "the" in this tree, they are the lowest thing with the label D, so they don't get marked. They're also the highest thing with the label D, because neither of them is higher than the other. They're just two instances of D.

And so an influential school of thought about what's going on in cases like that is to say, yeah, those are both phrases and not phrases. Try not to be too uptight about these labels. That's one way to talk about them anyway.

So now, I drew you a tree-- and some of you last time objected. I drew you a tree in which a prepositional phrase was modifying a verb phrase. That's-- I'll show you the tree again.

You've got a prepositional phrase, "in the garage." And I've got that prepositional phrase merged together with something with the label V. That's a prepositional phrase that's telling you where the finding of the book is going to take place. It's going to take place in the garage.

Now, prepositional phrases can also modify noun phrases. You can say things like "I will find books about syntax," where "about syntax" is telling you what kinds of books you're going to find. Now, this is just some consequences of that we can think about.

First, we've said that noun phrases can contain prepositional phrases-- books about syntax. And we know that prepositional phrases can contain noun phrases, which can contain prepositional phrases, which can contain noun phrases. So there is no reason to ever stop talking.

We talked about this when we were talking about-- I'm wearing my mask again. We talked about this when we were talking about-- the competence / performance distinction-- the fact that we're idealizing the actual kinds of sentences that people say. Here's another case of this.

So you can have a book about islands, and you can have a book about islands on lakes, you can have a book about islands on lakes on islands, you can have a book about islands on lakes on islands on lakes, and so on. Eventually, you will run out of things that your book can be about if you keep repeating this, but that is a fact about geography, and this is not a geography class.

There actually is a website-- or used to be-- that listed the largest island on a lake, and the largest island on a lake on an island, and the largest island on a lake on an island on a lake. It's kind of cool. There's a lot of stuff going around Lake Taal in the Philippines I remember. Is this clear?

So there's another-- I just said there is another instance where we might want to care about the difference between competence and performance. We've got a theory that we're starting to build about syntax that makes it possible for noun phrases to be arbitrarily long. No one's ever going to utter an arbitrarily long noun phrase.

Nobody's going to keep talking as long as this grammar would allow you to, but that's a fact about, as I said, geography and life. People have better things to do than to continue repeating these things. But it's clear we want a grammar that allows this.

So yeah, you couldn't actually utter an infinitely long noun phrase, but we now have a grammar that's capable of producing one. Another thing that it gets us-- and this is the heart of the reaction that I was getting last time when I showed you the tree that I wanted to do for that sentence-- is that there are cases of ambiguity. So this is a classic Marx brothers line in *Animal Crackers*, I think, Groucho Marx says to someone, "I once shot an elephant in my pajamas."

And there's a pause, and he says, "How he got in my pajamas, I'll never know." So Groucho Marx here is making use of the ambiguity of the original sentence. "I shot an elephant in my pajamas" has two things that it could, in principle, mean.

It could mean I shot an elephant while I was-- so here's in my pajamas. The prepositional phrase in my pajamas could modify the elephant. That is, it could be it was the elephant who was wearing the pajamas-- I shot an elephant in my pajamas.

Or it could be that we put together "shoot an elephant," and then we merge "in my pajamas" with that so that "in my pajamas" is modifying the way in which I shot an elephant. That is, I shot an elephant while I was wearing my pajamas. And so I shot an elephant in my pajamas, it's an ambiguous sentence. It could mean either I was wearing pajamas or the elephant was wearing pajamas.

Do people get that ambiguity? It's a classic joke. It's odd that we enjoy this. There's a lot of humor that has this shape, where someone says an ambiguous sentence that has one normal meaning and one strange meaning, and then the punchline reveals that they meant the strange meaning.

That's the form of this joke. "I shot an elephant in my pajamas"-- you, of course, think that he means he was wearing his pajamas. And then he reveals that, no, it was the elephant that was wearing the pajamas, and then everybody laughs.

As I said, it's odd that we-- I mean, normally, being told, haha, you misunderstood me, that's not fun. But we actually pay people to do this. It's kind of strange. Yeah?

AUDIENCE: So it almost seems like the one on the left that's like started reading is-- almost seems like a simpler tree--

NORVIN Uhuh.

RICHARDS:

[LAUGHS]

Yeah.

AUDIENCE: --but compared to the more complicated one, is that some of the reason why this is ambiguous? The one that has the normal meaning has this complicated structure, but the one that has the wrong meaning is a very simple structure [INAUDIBLE]?

NORVIN Yeah. No, it's interesting that you have this-- I mean, right now, what we have is just a grammar that predicts
RICHARDS: that it could mean either of those things. So that prepositional phrase in my pajamas can be merged in a couple of different places, and the consequence is that it could mean a couple of different things.

You're absolutely right that the tree on the left is prettier than the tree on the right. And people who work on how people deal with ambiguities like this in real-time-- this is something people work on-- processing-- develop theories about where the preferences are for where prepositional phrases should be attached in a place like this, whether there's a preference for trees like the tree on the left or trees like the tree on the right.

I think there isn't supposed to be a general preference for trees like the tree on the left. I think this is just supposed to be a case where, in principle, it's ambiguous and-- but people who work on processing have found places where there's a preference for one kind of tree over another, so that is something people work on.
Raquel?

AUDIENCE: I guess a simple question-- so at the bottom of the left, there's an NP, like my pajamas, and there's N-bar that's higher. I guess why isn't an NP down there if there's another NP up above?

NORVIN
RICHARDS: Yeah, so that's a very good point. When I said before that you give P to the highest thing with a given label, I should have said something more sophisticated-- something like you give P to the highest thing with a given label that is produced or that is being projected from a given head-- from a given word.

So this-- so "my pajamas" is an NP because it's the highest node that has an N that comes from "pajamas." And then there's a higher NP that's right under the VP right that you merge together with the verb, and that's an NP that's got its label from "elephant." So there are two NPs here-- one of them coming from "pajamas" and the other coming from "elephant."

That's a very good point. What you're pointing out is that when I said the highest thing with the label N, I was being too fast. It's the highest thing with a given label N, and we have to distinguish N's from each other. Ooh, lots of questions. Yes?

AUDIENCE: Actually, I think the thing about [INAUDIBLE] about the [INAUDIBLE] simple are not likely [INAUDIBLE]. Because I didn't get the normal reading.

NORVIN Oh, yes.

RICHARDS:

[LAUGHS]

AUDIENCE: [INAUDIBLE] imagining this guy was shooting himself while there was an elephant [INAUDIBLE].

NORVIN
RICHARDS: Oh, the elephant is inside his pajamas and he is also wearing them. Ah, yes. I don't know what kind of tree we want to build for that. That's an interesting question.

Actually, we're going to develop some tests in a second. So far, all I've done is assert this-- assert a couple of things. That string of words ought to have two different structures.

So that prepositional phrase ought to be able to modify either a noun phrase or a verb phrase. And we have the sense that that string of words is ambiguous. It can mean a couple of different things. I haven't yet given you any reason to believe that these structures really are the structures that are associated with those meanings. I'm going to try to do that in a second to motivate that claim.

And let's bear your reading in mind as I do that, and we'll see how it behaves with respect to the tests that I'm going to show you. This should all feel kind of familiar, right? So when we were doing "unlockable," we were saying, yeah, there's three morphemes-- there are two ways you can combine them.

And if we think about what these morphemes do with the things that they combine with, we can understand why the word "unlockable" is ambiguous in the way that it is. We're doing something similar here. So our rules for how things combine allow us to create these strings of words in a couple of different ways. And it's ambiguous-- wonder if our freedom of building couple-- having a couple of different ways to build trees for this has anything to do with the fact that it seems to mean two different things. Joseph, did you have a question?

AUDIENCE: Yeah. So looking at-- when you said that-- because on the left tree, there's two different noun phrases. And so following up on that, if you have-- would it also be appropriate to say-- so "pajamas" down all the way on the right is part of a noun phrase-- and that's part of a prepositional phrase, so that kind of chain of the noun phrase is terminated, so it's OK to start over with that?

NORVIN
RICHARDS: That's-- yes, that would work fine too. Your version of this raises the question of whether we'll ever find a noun phrase that has-- that is merged together with something else that also has the label N, or whether we'll ever find a verb phrase that is merged together with something else that also has the label V. I don't know whether we'll get around to seeing examples like that in this class.

It's not clear that there are such examples, and if there aren't, then that's interesting. We might want to make something of that. So yes, your amendment to what I said and my amendment to what I said are both good ways of talking about the answer to Raquel's question from earlier. Yeah?

AUDIENCE: So just to follow-up, I know someone asked about "I will," and so that, of course, has a modifier. But "I" in the sentence, do we just not [INAUDIBLE]?

NORVIN
RICHARDS: Oh, no. See-- I'm sorry. I'm being very unfair to you guys. I keep only showing you trees for parts of sentences. So we've not-- we haven't gotten any further than the verb phrase.

AUDIENCE: That [INAUDIBLE].

NORVIN
RICHARDS: So I'm trying to get as much mileage out of the verb phrase as I can before we go on to larger things. But you're right, eventually, we will do sentences, I promise. Questions about this? They're all good.

I was saying to the TAs the other day, you guys are-- it's nice being in a class full of talkative people. I appreciate it. So two trees, and a hypothesis that we might entertain is that the tree on the left is the one where the elephant was wearing the pajamas and the tree on the right is the one where the shooting involves me being in the pajamas-- sort of the normal reading-- normal for some of us, although it's been established that not all of us are normal.

Now, remember back when I was trying to convince you that there were such things as constituents-- that syntax cared about whether a particular string of words were all descended from a single node or not. I was showing you tests for constituent structure, and in your recitation sessions, you may have played around with different tests for constituent structure. So one of the tests that we were fooling around with was what I called topicalization.

It's possible to emphasize something by moving it to the beginning of the sentence. So you can say things like "the elephant I shot in my pajamas," or "the elephant in my pajamas I shot." Now, let's consider the tree on the left-- this tree.

Is there a constituent in that tree-- an "elephant" that doesn't have anything else in it? Several of you are appropriately shaking your heads. There are nodes that are above the words "an elephant."

There's a D that's above "in," there's an N that's above "elephant." And there's an NP up there which has "an elephant" as part of it, but it also has "in my pajamas." So in the tree on the left, there's no constituent "an elephant."

How about in the tree on the right-- is there a constituent "an elephant"? Yeah, there's a noun phrase like that. So when we do the topicalization-- "the elephant I shot in my pajamas"-- we should only be able to do the tree on the right and not the tree on the left.

That is, it should only have the meaning that the tree on the right has-- that I was wearing the pajamas and not the elephant. And several of you are raising your hands and I'll call on you in just a second, but before I do that, do people have the feeling that that's true? That if I say "The elephant I shot in my pajamas-- the aardvark I shot in my tuxedo,"

that I'm wearing these things. It's not my victims. And I think that's right. So the ambiguity that we have if we haven't done any topicalization-- that ambiguity was there because we had both of these trees.

And if we run a constituency test, that collapses the ambiguity, because it makes it so that we could only have the tree on the right, not the tree on the left. And so we can only have the meaning on the right and not the meaning on the left. Yes? Sorry, I'll get to you in just a second.

AUDIENCE: So yeah, on the tree on the left, would it be more correct to combine "an elephant" first before adding it to the big upper tree?

NORVIN Oh, you mean combine "an elephant" first and then put "in my pajamas" together with that?

RICHARDS:

AUDIENCE: Yeah.

NORVIN So we could do that. Notice that if we did that, there would again be a constituent "an elephant." So we would

RICHARDS: lose the result that we've got here, which is that if you front "the elephant"-- I'm sorry, I keep switching back and forth between the and an.

I'll just ask you to believe me that they're the same as far as this is concerned. But if we topicalize "the elephant"-- if we move that to the beginning of the sentence, then we lose the tree on the left. So you're-- let me make sure I'm understanding what you're saying.

You're saying, wait-- what about a tree that would look like this-- shot, and then we've got a noun phrase "an elephant," and then we've got a prepositional phrase here "in the (noun phrase)," and then determiner "my," and then noun "pajamas." You're imagining this tree.

And yes, notice, though, that if we had that tree, there would be a constituent here-- "an elephant." So now, there are two ways we can go. One would be to say aha, we're learning that although prepositional phrase can merge with a projection of a noun-- something with the label N-- it can't-- it has to merge with N, or maybe it has to merge before you merge a D-- that there are rules about the order in which you merge things.

We're going to get a chance to talk about things like that soon-- other places where you are so far-- let's see. We're at the stage of syntax where life is easy and free. There's ambiguity-- you can create trees however you want. You've now come up with a tree that we want to exclude somehow in order to avoid the result that first sentence would have this tree as a possible tree. We want to avoid that.

So there are two kinds of things we could do. One would be to say, no, you may not draw this tree, and maybe that would be about the order in which you can merge D and prepositional phrases. That would be one thing we could do. Another thing we could do would be to say, yeah, in order to be topicalized, you have to be a constituent.

But actually, there are some constituents that cannot topicalize-- that is, it's not a bi-conditional. That would be the other move to make. So this has been a very long and elaborate version of "yes."

And so you're right-- this is an imaginable tree, and so we must do something. So I showed you a couple of things that we could. Does that make sense at all? OK? Good. Katrina?

AUDIENCE: I was also going to bring up that you could combine "an elephant" before merging to the prepositional phrase, and so--

NORVIN Good point. And so I've answered. Good-- excellent. Good question. Yes, Joseph?

RICHARDS:

AUDIENCE: This might be getting ahead of this--

NORVIN Where we want to be?

RICHARDS:

AUDIENCE: --but obviously, I [INAUDIBLE]. So if you break that constituent off "an elephant" in the second tree corresponding to the first [INAUDIBLE]. Breaking off "an elephant"-- I don't know what the actual topology of these trees are and what the rules are, but aren't you crossing that over the I branch?

NORVIN Why don't you remember that question and ask it again once we have complete sentences? I mean, so far, the only condition on topicalization-- this operation that puts something at the beginning of the sentence-- that I've offered you is that the thing that you topicalize has to be a constituent. I haven't said anything else about where-- like, I haven't offered to draw you a tree for "the elephant I shot in my pajamas," for example.

Eventually, I will, but I'm not going to do that yet. I may not even do it today, partly because eventually, we have to get "I shot an elephant in my pajamas" just for an example.

[SNEEZING]

Bless you. So we'll get that first. Yes?

AUDIENCE: I know this is kind of [INAUDIBLE] but with the example of "an elephant" [INAUDIBLE] is that its own constituent so that we could technically be like, "the elephant, comma, in my pajamas, comma"?

NORVIN Oh, dear.
RICHARDS:

AUDIENCE: Like, separated it if was [INAUDIBLE].

NORVIN If it was-- you mean if we were able to draw trees like this?
RICHARDS:

AUDIENCE: Yeah.

NORVIN I shot an elephant--
RICHARDS:

AUDIENCE: Oh, wait. Did we explain why couldn't--

NORVIN Why we had better not do this? So we had two people point out-- one of them actually got to point it out, and
RICHARDS: then Kateryna pointed out that she was going to point it out-- that this is a tree that you could imagine. You could imagine being able to build a tree like this. And my reaction was, oh, dear-- we must do something to stop that.

So here-- I'll mark this tree with a frowny face or something. We've got to exclude this tree somehow-- maybe. We've got we've got to avoid the following problem. This sure looks like a tree for a meaning where the elephant is wearing the pajamas.

So a tree that has the same meaning as the tree on the left. But it's also a tree in which there's a constituent "an elephant." And the fact that I wanted to get across to you with this slide was that if you use topicalization to make it-- to find out-- I was only going to choose between these two trees-- to find out whether an elephant is a constituent or not, then you have to have the tree on the right where I'm wearing the pajamas.

The elephant can't be wearing the pajamas. Two people immediately said, wait, what about this-- imagine the frowning face tree that I don't have on the slide. And I said there are two things we could do. One would be to say, no, you may not do this maybe because there are rules-- which maybe someday, we'll get to-- that constrain the order in which you can merge a prepositional phrase and a D with a noun-- rules that will guarantee that if you're going to put a prepositional phrase and also a D in projections of a noun, you better do the prepositional phrase first and then the D.

And then we get to ask, well, why? Where did that rule come from? And the answer is, well, this is day two of syntax. But we'll get there.

AUDIENCE: [INAUDIBLE]

NORVIN Did that-- no, no, no, that's fine. The other thing we could do-- and here, let me say something I said before, but
RICHARDS: I'll say it a little more coherently possibly-- we'll see-- would be to say in order to topicalize-- in order to be fronted-- you have to be a constituent. But it's not enough to be a constituent.

Notice, the thing that you would be fronting in the tree on the right. It's not just a constituent, it's a noun phrase. And what you would be fronting over here is not a noun phrase, it's an N bar.

So you could say, ah, we're learning something new about topicalization. Topicalization-- yes, you must be a constituent, but it's not enough to be a constituent. You must actually be a phrase. You cannot just be a bar.

And then that would be a new and exciting thing to learn. We have to find out which of these ways of dealing with this tree is the better way. You had a question a while ago. I'm sorry.

AUDIENCE: Yes, so I might be jumping the gun here, but it almost seems to me like in the first tree-- no, that's a lie. Never mind.

NORVIN Good.

RICHARDS:

[LAUGHTER]

Yes?

AUDIENCE: We're doing all of this based on the fact that we don't want the kind of meaning where the elephant is wearing your pajamas, but what if you want to say a sentence like that?

NORVIN Well--

RICHARDS:

AUDIENCE: We're trying to exclude that meaning from the sentence, but what if someone wants to say that.

NORVIN Well, so--

RICHARDS:

AUDIENCE: "I exterminated the bugs in my walls."

NORVIN So wait. Leave the bugs alone for a second.

RICHARDS:

[LAUGHTER]

We have-- there's enough death in this class already. Whoa, go back. If somebody wants the meaning-- so let's back up.

Here's what I was going to do with this pair of trees. I was going to say, hey, look, "I shot the elephant in my pajamas" is ambiguous in the way that Groucho Marx took advantage of, and the ambiguity goes away. And so far, we've only done the first sentence-- "The elephant I shot in my pajamas."

That has to be the tree on the right. The tree on the right is the only tree in which that's a constituent. Immediately, people began doing the frowny face tree. Forget the frowny face tree for a second.

Those are the only two trees. It has to be the tree on the right. And "The elephant in my pajamas I shot"-- the ambiguity also collapses, but in the other direction. People have that feeling?

So if I say, "The elephant in my pajamas I shot-- the elephant in my tuxedo I offered some bananas." That doesn't mean I shot an elephant while I was wearing my pajamas. That second one-- "The elephant in my pajamas I shot"-- only means that the elephant was wearing the pajamas.

Why? Well, if we look at the trees we can see why. There's a noun phrase-- "an elephant in my pajamas"-- in the tree on the left, and there's no constituent "an elephant in my pajamas" in the tree on the right.

So these constituency tests-- topicalization-- forces us to one or the other of those two trees. And depending on which tree you're forced into, you only have the reading that's associated with that tree. And so the ambiguity collapses in the way that it should.

So once we nail down which tree we're looking at, we also nail down which meaning we have. Kateryna wanted to know what if I'm interested in the tree on the left? The answer is, well, either don't topicalize or do the topicalization-- the second topicalization-- The elephant in my pajamas I shot."

Those are both consistent with the tree on the left, but you can't do the first topicalization. Now, have I already warned you about this? There's a danger if you go further in linguistics that you will lose the ability to distinguish grammatical from ungrammatical sentences.

So your feelings about sentences will all become this kind of gray blur. It's sometimes called syntacticians' disease. And I have been a syntactician for longer than you have been alive, which is depressing.

And so I no longer have any judgments at all about sentences. But I think this is how it works. Does anybody want to object when I say these topicalizations only have one meaning and not the other? Yeah?

AUDIENCE: So how would you say that, while this topicalization [INAUDIBLE], and while [INAUDIBLE], it doesn't-- the first sentence still points to the second tree on the top slide.

NORVIN To the tree on the left?

RICHARDS:

AUDIENCE: Right, because while they both have the constituent "an elephant," the difference is that "shot" has a verb-- has a V-bar that's combined with "in my pajamas" while "shot" is never directly combined with [INAUDIBLE]. So I only point out that there might be a rule that only when they're directly combined together, they have [INAUDIBLE].

NORVIN So I was with you right up until-- I thought I was with you right up until the end there. The sentence, "I shot an elephant in my pajamas," the verb phrase can have either of these structures. Is that-- no?

AUDIENCE: Because I think the first sentence, you said I shot in my pajamas. So it was shot [INAUDIBLE] pajamas [INAUDIBLE].

NORVIN Oh, I see. And so you can only do that with the tree on the right, because "in my pajamas" got merged together with a projection of the verb "shot," whereas in the second one-- "The elephant in my pajamas I shot"-- what's wrong with having either of these trees?

AUDIENCE: So "The elephant in my pajamas I shot" couldn't mean [INAUDIBLE] because an elephant is never [INAUDIBLE].

NORVIN Ah, I see. Yes, I think-- I could be wrong, but I think what you are saying is another way of what I am saying. I think we're saying the same thing in different ways.

So I am talking about these trees as though they are objects that you can grab nodes in them and move them around. You are talking about these trees as if they are sequences of events. They're-- which is the way, I encourage you to talk about trees earlier on.

They're records of the order in which you put two things together. And you're saying, yeah, if you put "in my pajamas" together with "shot," then you can do the first sentence. And if you put "in my pajamas" together with "the elephant," then you can do the second sentence.

That is, which kinds of things you can topicalize cares about which order you put things together in. And I think we are saying similar things. I'm just saying it representationally, if you want. I'm inviting you to look at these trees and think about them as objects that you can move around, and you're thinking in terms of the order in which you to put things together.

So I think you're right, but you're right in the same way that I am right. This is the kind conclusion of this kind of conversation that I always like-- it's the one where everyone involved is right. Other questions about this so far?

OK. So elephants-- is this enough elephant violence? Possibly. Let's see. Oh, no, there's so much more violence. I'm sorry.

So this is just graphically illustrating what I just showed you-- or told you in the first sentence. There needs to be a constituent, the elephant. And it's-- yeah, the blue constituent. It's the one in the tree on the right.

And in the second sentence, there needs to be a green constituent-- a constituent "the elephant in my pajamas," and it's the constituent in the tree on the left. Notice that this also makes predictions about other kinds of sentences. So if you had thought these trees-- all this stuff about merge-- the order in which you'd merge things-- you don't really need any of this.

Here's an imaginable thing you could think. You would need to get us to move fairly quickly through that last slide. But forgetting about topicalization for a second, if I told you, "Hey, look, I shot an elephant in my pajamas," it's ambiguous as to who's wearing the pajamas.

And I propose to deal with it with these trees, you can imagine being someone who says, no, look, "in my pajamas" is just vague. Somebody's got to be wearing the pajamas, and you figure it out from context whether it's me or the elephant, and that's it. There's no need for any trees.

Just so we're clear, this is not the right way to think about this, but it's something you could imagine thinking. Here-- so the stuff we talked about in the last slide is one reason not to think about things that way. Constituency tests seem to nail down where the pajamas are in the structure, and that forces you to one reading or another.

Here's another kind of sentence that also suggests-- where we also make a prediction, which I think is correct. So if I say "I shot the elephant in my pajamas in a tuxedo"-- I think that's grammatical-- and I think it's a sentence on which somebody is wearing pajamas and somebody is wearing a tuxedo, who's wearing the pajamas?

The elephant's wearing the pajamas and I am wearing the tuxedo. Does anybody not have that reading-- or have instead the reading where I am wearing the pajamas and the elephant is wearing a tuxedo? Please put a cast out of your mind-- hold on-- readings in which the pajamas are inside the tuxedo or something.

[LAUGHTER]

I can see all of you thinking of alternatives, but just try to imagine cases where one person-- one entity is wearing pajamas and another one is wearing the tuxedo. If that's what's happening-- yes, [INAUDIBLE]?

AUDIENCE: [INAUDIBLE].

NORVIN No, the pajamas are not the tuxedo.

RICHARDS:

[LAUGHTER]

Ah! MIT undergrads-- man. No, there are two sets of clothing and two entities, and I am also not an elephant just in case any of you were thinking of that. And the clothes are not nested, or mixed, or anything like that.

There is a set of pajamas and there is a tuxedo, and somebody is wearing the pajamas, somebody is wearing the tuxedo. Who's in what? I just asserted the elephant is in the pajamas and I'm in the tuxedo. It can't be the other way around.

And we can see why. If I was smart enough-- we'll see if I was smart enough to draw a tree in the next slide. Yes, I was! Hot dog. Why? Well, because if you're going to have two prepositional phrases-- "in my pajamas" and "in a tuxedo"-- and you're going to attach them in the ways that we've been attaching prepositional phrases before, this is the only way to do it to get this order.

Unless you're going to cross lines or something like that, this is the only way to get this order of words. So "in my pajamas" has to modify "elephant" and "in the tuxedo" has to modify the verb phrase, and that's the only reading this, in fact, has. So day two of syntax and we're already successfully predicting facts about reasonably complicated sentences involving too much clothing in inappropriate places. Yeah?

AUDIENCE: We haven't really discussed this directly, but is it a rule that you can't cross lines in a tree?

NORVIN I hereby declare that it is a rule that you cannot cross lines in trees. Yes, you're right, we have not discussed that.

RICHARDS: Back in the day, I would have called this the *Ghostbusters* rule just because the *Ghostbusters* had a rule that you couldn't cross streams. Never mind.

Yeah-- other questions? Now, I have this vague sense that some of you would like to see what the rest of the sentence looks like. Call it a hunch-- I don't know. When you've been an instructor as long as I have, you get these vague hints like the fact that 12 of you have asked me where is the subject going-- where should I put "will"-- how do we do the rest of the sentence-- why, oh, why are you only showing us verb phrases and not entire sentences? So let's do the rest of the sentence.

To do the rest of the sentence-- first of all, "the girl" is a noun phrase that's kind of boring, but "girl" is like "the book" or "the garage." And for "will," we are going to invent a new kind of node. We're going to call it T for tense.

Just to prepare you for disappointment, there are all kinds of things that can go under T. You can also say "The girl can find the book in the garage," or "The girl might find the book in the garage." I can't talk today.

So there are variety of things that can go under T, not all of which it's plausible to think of as instances of tense-- like "might" is probably not a tense. If you look it up in traditional grammar, they're not going to call it a tense, but we're going to call it a tense.

We basically just need a name for it. So there's this thing. Notice it's not a verb, so you can't say things like the girl will the book. It's something else, and our name for it is going to be "tense."

People have called it other things. They've called it the auxiliary or whatever, but tense is a conventional name for it in the literature, so I'm going to call it that. Yeah?

AUDIENCE: So how would you differentiate the tense from [INAUDIBLE]?

NORVIN Well-- so those--

RICHARDS:

AUDIENCE: "The girl quickly found--"

NORVIN "Quickly found the book in the garage"-- yeah, good question. Let me give you the-- let me give you an answer that I won't be able to explain soon, but that's a very nice question. So the girl will find it-- I'll just say that-- and the girl quickly found it.

And you want to know what's the difference between these two things. Here's one difference. There are a bunch of phenomena that this gets to participate in this doesn't. So for example, if I want to make this into a question, I can ask the question, "Will the girl find it?" where I put "will" at the beginning of the sentence, and that makes the sentence a question.

You can put "quickly" at the beginning of the sentence too, I guess-- "Quickly, the girl found it." That's a grammatical sentence, but it's not a question. It doesn't make it a question.

So that gives us some reason to want these to have different statuses. I'll give you another reason to have them have different statuses. If I ask you-- well, is this true? Maybe I'm about to lie. Maybe I should quit while I'm ahead.

I think this is true. If I ask you, "Who's going to find the book?" you can answer "The girl will." But if I ask you "Who found the book?" it would be odd for you to say "The girl quickly."

That's-- I think-- is that true? Did I just lie? I think that's true. So that's another reason to think there's some difference between "will" and "quickly."

Now, what's the difference? Well, we'll get to that, but-- or like how long are we going to explain these things, and we'll get to that too. This is just meant to convince you that maybe they're different things-- they have different properties.

OK, cool. So far, so good. Now, we need to do some more merging. Here's what we'll do. We'll merge T with the verb phrase, and then we'll merge "the girl" with the result so that the entire sentence will be a TP-- a tense phrase.

Everything is a phrase. There are these, there are noun phrases, there are prepositional phrases, there are verb phrases. And now, we have a new kind of phrase-- a tense phrase-- which is the result of merging tense will with a bunch of things.

There-- that's how we'll do sentences Cool. That was easy and painless. Yeah?

AUDIENCE: What does topicalize mean again exactly?

NORVIN
RICHARDS: Oh, it's the name that we've got for taking constituents, putting them at the beginning of the sentence, and it adds some kind of oomph to the thing that you put at the beginning of the sentence. So if I say things like "in the garage, the girl will find the book," that's a sentence of English.

It's not the most natural way to say it-- you would only say it if you wanted to put some kind of special emphasis on the garage. And we will not ever, in this class, try to be more definite than that about the meaning of topicalization. But it's a handy phenomenon for finding constituents. Yeah?

AUDIENCE: Every node on the tree is a constituent?

NORVIN Yes.

RICHARDS:

AUDIENCE: What is "will find the book in the garage"?

NORVIN It's a T bar.

RICHARDS:

AUDIENCE: Well, yes, but we have constituency tests that we use to tell whether something is a constituent. Does that work for a tense phrase?

NORVIN Yeah-- OK, that's a good question.

RICHARDS:

[LAUGHTER]

That's a good question. Let's see. So let me-- so let's see. You would like to know-- is this what you're asking me? Let's see.

We've got three things-- the noun phrase, "the girl," and the T "will," and the verb phrase find "the book in the garage." Oh, here. We have a technical term for this. It's called a triangle.

It's used when you do not wish to draw the inside of a structure. So this is just an abbreviation for that. Is that OK? So I've just used a triangle here so that I won't have to draw that entire phrase.

What I really need is like a stamp or something that I can use on the blackboard that will create these phrase structures for me. We'll tell you on problem sets if we want you to not use triangles. Sometimes, we'll ask you not to use triangles so that we can make you show us everything that you think about the insides of structures, but for now, I'll use a triangle.

So I just casually said, hey, I've got a good idea-- we'll merge "will" first with this, and then we'll merge the result with that. If we're doing merge the way we've been doing merge, there's only one other option, which is this. And so you would like to know, how do we know that it's what's on the slide? How do we know that it's not what I've got here on the board?

Just so nobody gets confused, this is not the right tree. That's the right tree, but now let me see if I can come up with anything that will convince you that it's the right tree. First of all, if we tried to use topicalization, which is the test that we had before-- if we tried to use it on the tree here and we tried to topicalize T-bar, we'd end up with-- "I said the girl would find the book in the garage and will find the book in the garage, the girl."

Now, as I mentioned before, my grasp of English is now a little shaky after years of abuse, but I think that's not great. Do people agree? So if there is a constituent T-bar here-- I tried to soften you up for this possibility earlier-- we need it to be the kind of constituent to which topicalization can't apply.

That is, topicalization doesn't get to apply to everything. And I think I also floated the possibility that it cares about whether you're looking at a P or a bar-- that you can't topicalize bars, you can only topicalize P's. This might be another case where we want to take that possibility seriously. Yeah?

AUDIENCE: It seems like that-- the one on the board works better as a constituent, because you could be like, "Who will find the book in the garage?" and then say "The girl will." But if you say "What will the girl do," you can't say "Will find the book in the garage."

NORVIN You can't say "will find the book in the garage"-- if-- I am astonished by what you have just said. If I've just--
RICHARDS: you've just said "The girl will find the book in the garage." Can I say "Will find the book in the garage?" Some think yes, others think no. We'll have a wrestling match outside later.

AUDIENCE: That makes sense. But if you're astonished, you could say "The girl will find the book in the garage"-- "The girl will?"

NORVIN (QUESTIONINGLY) "The girl will?"-- ah, yeah, that's true. You guys are discovering a phenomenon called ellipsis.
RICHARDS: Ellipsis is a phenomenon whereby you can take chunks of the sentence and fail to pronounce them.

You can remove chunks of the sentence. So if I ask you a question like, "Who will find the book in the garage?" you can say "The girl will." Or I can say things like "The boys will find the book in the garage and the girl will too."

All of these-- the way we would talk about them in terms of tree, like the one that's on the slide there, is in terms of what's called VP ellipses. It. Is this process of silencing constituents-- silencing phrases-- has applied to the verb phrase when you say things like "Who will find the book, (blah, blah, blah)?"-- "The girl will."

So there's a blank here, and the blank is understood as being the same as the preceding verb phrase. And VP ellipsis is a huge phenomenon, which we will get a chance to talk about actually because it's going to be useful in a couple of weeks for other phenomena. Notice-- I'm trying to think if there's a way that I can convince you.

And so that's not where you were going with this. Where you were going with it was, hey, look, "The girl will" is a constituent. There is a thing that we want to have be a constituent-- we want it to be a T-bar like here, whereas what I'm saying is, no, we want the structure on the slide, and there is such a thing as VP ellipsis that allows you to fail to pronounce verb phrases.

Let me see if I can come up with another test that will help you believe in one of these over there. There are other phenomena that people use to diagnose constituent structure, and I'm trying to think if there are any that I can introduce painlessly. You-- ah, no. So I was about to introduce coordination, but I think I won't.

You know what? Your TAs will prove to you that it's the tree on the left and not the tree on the right in the recitation section. So definitely go to the recitation session this week, because your TAs will help you with this. I don't want to go too far down this path because there are-- if I try to show you the constituent tests that would help us to find that, I think we'll be in trouble.

There is one-- well, maybe I can do this now. Can I do this now? I'm going to get in so much trouble. This is not going to go well.

I'm going to regret doing this, and we're almost out of clock. Tell you what-- I will prove to you-- you don't have to-- so you should go to recitation session, but I will prove to you in the next class that that's the right tree and this is the wrong tree, but it's going to require some setup. And if I try to do the setup now, we'll be in the middle of the setup at the end of class, and we'll all go away unhappy.

So this is a really excellent question, and you're right to be skeptical and alarmed. But everybody write the tree that's on the board here, and I will also reproduce it on the next set of slides for Thursday. And then you will go into spring break understanding why I think it's that tree and not this tree.

But if I tried to show it to you now, I'll just hurt all of us. Yeah good questions. Are there other questions about this. I'll very quickly move away from this issue.

So I want to go back to the verb phrase just as an exercise in making sure that we all know what we're doing. So we're going to do "I will tickle the child with the feather. Ambiguous sentence-- does everybody agree? So what are the things that it can mean? Can somebody paraphrase them for me? Joseph?

AUDIENCE: Either there's a child that is holding a feather and your going to go tickle him or her, or you're going to go tickle the child, and you have a feather in your hand, and you're going to use the feather.

NORVIN
RICHARDS: Yep, nicely paraphrased. So give me neither of those things. We think that we can build this in a couple of different ways. So "I will tickle the child"-- we have two places to attach "with the feather."

So two trees for this. I'm going through this fast because we're running low on time, but is this all clear? This is just the same kind of tree that we've been drawing up until now.

And constituency tests, like topicalization, tell us that we're right to associate these two different trees with two different meanings. So these trees are basically just like the trees we did-- in fact, they're identical to the trees that we did for "I shot an elephant in my pajamas." The prepositional phrase that's at the end of the sentence can either be part of the noun phrase that's also at the end of the sentence or it can modify the verb phrase.

It depends on whether we're doing, in this case, the tickling with the feather or whether it's the child who has a feather and I'm going to tickle them some other way-- maybe with my fingers. And then if we do topicalization, that makes the meanings collapse. So "The child I will tickle with the feather" only has the tree on the left.

"The child with the feather I will tickle" only has the tree on the right and it only has the meaning on the right. Does everybody see that? This is review of where we are so far with the constituent structures-- constituency tests that we have. And as I said, I will reveal another one to you on Thursday, which will help me to get rid of this tree. Yeah?

AUDIENCE: Oh, so that second sentence-- I think this is a feature of English grammar, which is that you could understand "the child with the feather" [INAUDIBLE] as a nondestructive modifier. So that I have a child with a feather and I will tickle--

NORVIN "I will tickle people generally. The child with the feather, I will tickle." Really? Maybe. If so--

RICHARDS:

AUDIENCE: "I, the child with the feather"--

NORVIN "I, the child with the feather, will tickle."

RICHARDS:

AUDIENCE: --[INAUDIBLE].

NORVIN I think I want "the child with the feather" to be after "I" for that. I think that was Kateryna's point.

RICHARDS:

AUDIENCE: I am the child.

NORVIN "I, the child with the feather"-- "I, the professor in this class, demand cookies." I think that's grammatical-- even
RICHARDS: plausible. Cool. So yeah, good point. There could be other structures to think about here.

Because we're almost out of time, let me talk quickly through some terminology, and then I'll let you guys go. First bit of terminology-- when people are talking about trees they often use feminine kinship terminology to talk about relationships between nodes in the tree. So if I want to say something like "I will tickle the child," we have pairs of nodes that were merged together to form larger objects.

Like in this tree, we merged the T-- "will"-- with the verb phrase-- "tickle the child"-- to form the T-bar that's just above them. What we say about those is that they are sisters. So if you have two things that are the two things that were merged together to create one larger thing, those two things are sisters. Similarly, we say that VP is the mother of V and NP.

And we also use the word "daughter"-- sorry. We also use the word "daughter." Although I don't have it on the slide, I should add it. So you say that the V is the daughter of VP.

That's as far as people go with kinship terms, so you don't hear about grandmothers, or aunts, or cousins, or anything like that. But people use those terms to talk about relationships between nodes in the tree. The relationship of motherhood is-- so the relation that is created between two nodes that are merged and the new node that you create via merge, that's the relationship of what's called immediate domination.

So the verb phrase immediately dominates the V and NP. That's just another scarier way to say that the VP is the mother of the V and the NP. The VP is the thing you created by merging V and NP together.

And dominate-- so immediately dominate is kind of the basic relation in trees. It's the relation that's created by merge. Dominate is the transitive closure of immediate dominate. So VP dominates everything it immediately dominates, and everything those things immediately dominate, and everything those things immediately dominate all the way down to the bottom of the tree.

So that verb phrase dominates the verb and the NP and also the D and the N-- "the" and "child." It dominates the things that are below it that were there when it was put together. And I've been using this word "constituent," but now we can talk about constituents using this terminology.

We'll say that something is a constituent if all and only the words in that thing, alpha, are dominated by a single node. So there is a constituent-- "tickle the child," for example-- that verb phrase-- because there is a verb phrase that dominates just those words, "tickle the child." There is no constituent "will tickle" in this tree, because there's no node that just dominates the words "will tickle."

Let me-- because we are just about out of time, but not quite-- and this would get us into something new-- let me get started on getting rid of this tree, and then we'll pick it up here next time. Let me show you some data. Consider sentences like "She likes Mary." Let's start with that one.

No-- here. Let's do "She thinks I like Mary," and for that matter, "She thinks I"-- no-- "Mary thinks I like her." These are two grammatical sentences in English-- "She thinks I like Mary" and "Mary thinks I like her." In the second sentence, we've got "Mary" and we've also got "her." Can "her" refer to Mary?

AUDIENCE: Yeah.

NORVIN Yeah. It could also be somebody else, but it could be Mary. We'll mark that by putting a little subscript on "Mary."

RICHARDS: I'll call it subscript I, and we'll put the same subscript on her.

So "her" could refer back to "Mary." It could also refer to any other person-- any other female person. "She thinks I like Mary." Can "she" be Mary? No.

So here, she-- Mary can't be the same person. It would be bad for "she" to refer to the same person as "Mary." Why is that do you think? Yeah?

AUDIENCE: Because that's [INAUDIBLE] "I like Mary" is a constituent, and so when I define "Mary" inside of the constituent-- oh, shoot-- this is not working out.

NORVIN No, no.

RICHARDS:

AUDIENCE: [INAUDIBLE].

NORVIN Does anybody have a simpler theory? Yeah?

RICHARDS:

AUDIENCE: Is it simply because in the first sentence, Mary hasn't been established as a person yet [INAUDIBLE]?

NORVIN So good. That's where I was hoping the first person would go. Joseph is already going more sophisticated. So one

RICHARDS: theory we could have would be "Mary" can't refer to somebody-- so "she" can't refer to somebody who hasn't been mentioned yet. She can't refer to somebody who's later in the tree.

Here, "her" is referring to somebody on its left. Notice-- think about a sentence like "Everyone who knows her likes Mary." Can her refer to Mary there?

Yeah. So not to immediately dump on your hypothesis, but I'm immediately dumping on your hypothesis. So pronouns actually can refer to things that are later in the tree. Sorry, let me say that again more coherently. Pronouns can refer to things that are later in the sentence.

You can tell I'm a syntactician, because when I think of sentences, I think of trees. So the relationship that holds between "she" and "Mary" here-- between "her" and "Mary" here-- the thing that tells you whether a pronoun can refer to a person-- it can't just be about whether the person's name is later in the sentence.

It's going to turn out to be about the structure of the sentence. So we'll develop a theory of these kinds of facts, which will be another test for constituent structures. We'll develop a theory of that, and it will tell us that this tree is wrong.

But I'll first finish developing that theory, and then we'll be able to use it as an additional test for structure. That's the incentive to come to class next time. You'll get to see how that's going to work. Let's stop there unless people have any questions about this stuff. Good. Let's just pause it right there, because if I start trying to show you this any further, we'll just all get confused.